



ECO EXPLORERS:

ENVIRONMENTAL EDUCATION FOR
SUSTAINABILITY FOR CHILDREN

Abdülkadir KABADAYI



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Eco Explorers: Environmental Education for Sustainability for Children

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FOREWORD

In an age where our planet faces unprecedented environmental challenges, the imperative for environmental education for children has never been more urgent. “*Environmental Education for Sustainability for Children*” emerges as a beacon of hope in our collective quest for a sustainable future. This compendium is not merely a resource; it is a manifesto—a call to action for educators, parents, and caregivers to nurture a generation of eco-literate and environmentally conscious citizens.

Within the pages of this book lie the seeds of change—seeds that, when sown in the fertile minds of young learners, have the power to sprout into a flourishing ecosystem of environmental stewardship. From the majestic forests to the depths of the oceans, from the intricate web of ecosystems to the delicate balance of biodiversity, “*Environmental Education for Sustainability for Children*” invites children to embark on a journey of discovery—a journey that will awaken their sense of wonder and awe for the natural world.

At its core, this book is a testament to the transformative power of education—the power to shape attitudes, inspires action, and catalyze change. Through hands-on activities, immersive experiences, and thought-provoking discussions, children are encouraged to explore, question, and critically engage with environmental issues. By fostering a deep connection with nature, they develop a profound appreciation for the Earth’s beauty and a profound sense of responsibility for its protection.

But “*Environmental Education for Sustainability for Children*” is more than just a curriculum—it is a testament to our collective responsibility to safeguard the planet for future generations. It is a rallying cry for educators, parents, and policymakers to prioritize environmental literacy and sustainability in educational settings. It is a declaration of our unwavering commitment to building a more just, equitable, and sustainable world—one where every child has the knowledge, skills, and motivation to be an agent of positive change.

As we embark on this journey together, let us remember that the future of our planet lies in the hands of our children. Let us empower them with the tools, knowledge, and passion they need to become guardians of the Earth. Let us nurture their innate sense of wonder and curiosity, guiding

shared vision of them towards a deeper understanding of their role in the intricate tapestry of life.

“*Environmental Education for Sustainability for Children*” is not just a book—it is a testament to our world where nature thrives, communities flourish, and future generations inherit a planet that is vibrant, resilient, and sustainable. Together, let us embark on this journey of discovery, learning, and transformation—one that will shape the destiny of our planet for generations to come.

Prof. Dr. Abdülkadir Kabadayı

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CHAPTER I

ENVIRONMENTAL CONCEPT AND ENVIRONMENTAL EDUCATION, STAGES OF ENVIRONMENTAL EDUCATION, OBJECTIVES OF ENVIRONMENTAL EDUCATION

1. Environmental Concept

Problems related to the environment came to the fore in the late 1960s as a result of the reactions of individuals and even societies. Although this issue is being researched in depth in the world, there are studies on environmental problems in our country that are far from the truth. Unfortunately, the impact of the environment on people and society is postponed by our country within the framework of science programs. Depending on the subject, the effect of environmental problems on the behavior of the individual and society will ensure that disciplined, questioning and at the same time responsible individuals and societies are obtained when reconciled with science education. Considering the ages at which the development and character tendency of individuals begin, it is obvious that it is necessary to start from kindergartens and nurseries in terms of raising responsible individuals (Taşkın and Şahin, 2008).

People who have to think ahead have started to create clean environmental awareness for the future. Steps have been taken in environmental awareness with different studies. Because everything is in balance. Nature and the environment also have to be in balance with humans (Yücel and Morgil, 1999).

The environment can be negatively disrupted by human, natural events or industrial origin. While human beings have developed in industry, they have damaged the environment on the one hand. This came to him years later. Humans have transitioned from natural life to cities, and the population has increased. With industrialization, the damage to the environment has multiplied. Of course, although nature did not reveal itself at first, the damage and negativity to the environment came to light in the following years. Human beings, who

understood this situation late, this time moved towards the effort to create this consciousness on their own or together (Güler, 2009).

Research on the environment is increasing day by day. When the fear of losing the environment and nature and the realities began to be faced, these studies increased (Akinoğlu and Sarı, 2009).

When a brief definition of the environment needs to be made, it is described as the environments where living things have a direct relationship in accordance with their basic needs, affect each other with good or bad meanings, and in addition to this, the area or environment where living things or some living beings continue their lives (Atasoy, 2006; Guler, 2009).

2. Environmental Education

Environmental education first emerged in our world with the aim of human dominance over nature and aimed to prevent the deterioration of nature under human sovereignty. Children are the most important cornerstone of the continuous implementation of environmental education in society. Because children are the people who dominate nature in the future. However, this situation has been ignored in the education system of our country. The importance given to children in environmental education has just increased in our country. We believe that one of the most important reasons for the increase in environmental education given to preschool children may be the excessive increase in environmental problems in Turkey. However, it is not possible to say that the education given to preschool students on this subject is sufficient. The more conscious and experienced a teacher is in environmental education, the more capable the preschool children who have received this education will be in preventing the deterioration of the environment (Güzelyurt and Özkan, 2018).

The concept of mastering nature is changing rapidly due to the advancement of science and the advancement of technology accordingly. The normal result of change is societies that consume rapidly and produce in direct proportion to this consumption. Therefore, these changes cause environmental awareness to remain in the background. In order for environmental awareness not to remain in the background and to put a stop to this situation, the individual must realize that he is a part of the society and therefore the environment, have the ability to empathize with the environment and the individuals in the environment, and in this context, he must consciously carry out production and consumption activities. Such individuals, unfortunately, are not very common in the world. They usually occur in cultures with high empathy skills. These individuals are

frequently encountered in cultures where the right environmental education is given in a more accurate language. Environmental education is the backbone of education in our country. However, in schools, this education is mostly given theoretically. Theoretical education is not enough to eliminate the disasters that await nature. In addition to theoretical education, non-formal education should also be started so that individuals can become environmentally sensitive people in practice (Ilgar, 2007).

Environmental education started late by ignoring the ages at which the character and personal development of the individual is formed will not have a positive effect. Because there is a direct effect between environmental education and age (Taşkın and Şahin, 2008).

In our country, where the reading rate and writing rate are so low, the importance of informal education in environmental education should not be ignored and this education should be considered (Taşkın and Şahin, 2008). Environmental education should not only be limited to providing information, but should also arouse responsibility in individuals and enable them to take action. In the environmental education process, attention should be paid to the use of both auditory and visual tools (Ilgar, 2007). According to Özdemir (2007), when the environmental education programs implemented in Turkey are examined, it is concluded that they are narrow in terms of both quantity and quality and need to be improved.

In today's conditions, global disasters are constantly occurring. Under these circumstances, the importance of systematic environmental education, especially a living-centered environmental education, on children should never be forgotten. Living-centered environmental education can only be provided by a science education program. Environmental education is not included in formal education. For this reason, it is extremely important to give this education to children in the preschool period. It will be extremely efficient to apply a multidisciplinary education while applying environmental education on children. Because children who undergo this type of education will be prepared for possible misconceptions in the future. An environmental education that is free from value judgments and politics eliminates various class factors for children and makes individuals more sensitive to their environment (Taşkın and Şahin, 2008).

A healthy life is the most fundamental right of all people in the world. Environmental education is extremely important in order to talk about the existence of this right. Because environmental education is the building block in

providing the conditions that people need to develop and exist. It is not enough for environmental education to be included in the education system. It should become the basis of education itself (Ilgar, 2007). As a result of the changes and technological developments, a traditional environmental education is insufficient in terms of the environmental problems of the world and the solutions that will help to eliminate these problems. In addition to the traditional method, it is aimed to create a great platform for the continuity of life in the world with education for a sustainable environment and the development of a number of methods that will provide this situation (Özdemir, 2007).

Environmental education began to come to the fore in the 1970s, when human harm to nature became extreme. Because in this period, the developing technology and industry started to cause serious damage to the environment. When people realized that the damage they caused to the environment could only be corrected with their own hands, they began to find research and develop methods for environmental education. The only way for people to continue their lives without lowering quality standards will be to correct the damage they cause to the environment in their interaction with the environment. Therefore, environmental education has become the most important method for this purpose (Özdemir, 2007).

The main purpose of environmental education; Individuals are individuals who can produce and consume consciously, are responsible for environmental issues, have strong environmental empathy skills and can exhibit responsible behaviors in all these matters. In order to achieve this goal, environmental education should not remain in theory and should be applied seriously (Ilgar, 2007).

Environmental education needs a new perspective. Because today, our world and nature are under serious threat. Developing industry and technology endanger our environment and ecosystem (Özdemir, 2007).

3. Stages of Environmental Education

3.1. Environmental Education in Preschool Education

In today's world, children grow up in concrete boxes. Unfortunately, what children who grow up in the middle of the city see about nature does not go beyond the trees planted in the middle of the streets or stray animals. This situation causes children to be deprived of the beauties of our world and therefore it becomes difficult to protect the environment, which is our future and source

of life. Environmental education to be given in the preschool period provides both to introduce children to nature and to provide them with environmental protective habits that they can continue in adulthood. This time period is a great opportunity for our world and humanity (Ogelman and Güngör, 2015).

The 2-6 age period is the period when individuals gain personality traits. This period, which we call preschool, is the period when many things are shaped. This period, in which the leading role is child participation, is shaped within the framework of parent-student, school-teacher with the importance of interdisciplinary activities and interaction between lessons. It is of great importance that the individual actively participates in the event in raising individuals who can express themselves, are aware of their wishes, value the environment and people, and are sensitive to this issue (Talay, Aslan and Belkayalı, 2010).

One of the biggest importance of the preschool period is that it shapes our future life and forms the basis for our habits. The preschool period is one of the most important periods for conscious parents to raise awareness of their children about the environment. Because during this period, sensitivity and awareness towards the environment increases. Qualified and regular environmental education to be given to pre-school children is the biggest advantage in terms of protecting our world and keeping it livable (Akbayrak and Kuru Turaşlı, 2017).

Environmental education, which is considered as a process, lasts a lifetime. In addition to formal education, early childhood draws attention as a critical period of great importance in gaining the behaviors and attitudes of individuals (Oğuz, Çakıcı and Kavas, 2011).

The preschool child should not be dealt with only by the time spent in the classroom without limitation. You should get to know the school and its environment and offer a lot of opportunities. They should take advantage of all physical facilities. Experience by seeing and living is important in everything. Experiences are also very important in individual-centered trainings. He learns by experiencing. His curiosity and questioning increases. In preschool education, it is important for children to organize the external environment and experience these environments (Talay, Aslan and Belkayalı, 2010).

The use of space is very important for children of this age. This should be taken into account for their important development, such as psycho-social, emotional, psychomotor. Because these times, the foundations of which have been laid, are very precious. The interaction of the individual with his friends and environment in the open environment is very important. If self-educated,

social individuals are desired, these points should not be taken lightly (Talay, Aslan and Belkayalı, 2010).

Unfortunately, the programs related to environmental education in the preschool period in our country are not very diverse. These programs need to be diversified so that preschool children can get to know the environment better and beautify their environment. In terms of environmental education in the preschool period, the work does not end only with teachers. A conscious family means a conscious child. Children who are raised consciously mean individuals who are sensitive to the environment and protect their environment in the future. In order to implement this situation, it is necessary to raise awareness of families about such environmental education programs and to ensure their participation in the programs. We are of the opinion that longitudinal studies should be carried out on environmental education. Different age and gender groups should be included in the studies to be carried out; In particular, special programs should be developed for teachers who teach preschool children. The structural and educational characteristics of kindergartens should be arranged in accordance with environmental education and such kindergartens should be increased. It is extremely important that preschool teachers are individuals who are more sensitive to the environment and have a mind structure that is not afraid of the environment (Ogelman and Güngör, 2015).

Education is a whole system. The integrity of the lessons, the integrity of the family and school perspective are all important separately. Individualization of education, materials used in education, classroom and school environment, teacher perspectives and self-education situations are a whole. It guides us about the suitability of the school physical conditions and the applicability of the education program. All of these should be evaluated separately by using the awareness and perspective of the teachers and socialization methods, caring about the one-to-one experiences of the children, taking their ideas and looking at them from their point of view. Raising nature-friendly individuals and cooperation in this regard will be beneficial to strengthen preschool education (Talay, Aslan and Belkayalı, 2010).

3.2. Environmental Education in Primary Education

The environmental awareness of the countries is progressing differently. Some countries attach more importance to self-educated individuals in this regard. Countries that are aware of this include them in their research. In their research, they emphasize the protection of the balance of nature and the

sensitivity of human environmental awareness. Environmental awareness, which starts in the family, continues with this education in school life. The family's perspective here also shapes the individual. In the education given in the school environment, it gains importance with its content, quality and all its scope (Akınoğlu and Sarı, 2009).

It is said that the more conscious people, the more conscious the society, the cleaner the environment. The more consciousness is formed in humans, the less damage will be. For individuals with high sensitivity, environmental awareness education should be carried out correctly and gradually, starting from the first basic education (Akınoğlu and Sarı, 2009).

If it is desired to gain consciousness, it should be started in the most basic education for this individual. As the saying goes, the tree bends when it is wet. The people who will raise this awareness should be well-equipped people in this regard. It is necessary to get detailed information about environmental awareness from experts. Environmental awareness is created in the first family. Just as parents are role models at home and in their environment, the child will be shaped in that direction. Family and guardians should not contradict themselves on this issue. We should move forward together in common directions (Yücel and Morgil, 1999).

The increase in nature problems in countries and around the world also increases the researches. The issue of the environment should be addressed in all its aspects. Family, school life, politics and science are mentioned a lot and solutions are tried to be offered. In our country, a new era has been opened at the primary education level in this regard, and it has started to be included in courses such as science and technology and social studies (Akınoğlu and Sarı, 2009).

In order to prevent the damage to the environment from the past to the present, it is necessary to make fundamental changes and develop programs in the educational programs with the objectives and principles to be established by taking into account the opportunities of Turkey in line with the international environmental education program in the education process from pre-school and primary education to the university (Ünal and Dımişki, 1999).

3.3. Environmental Education in Secondary Education

As well as the importance of starting environmental education in the preschool period, it is also extremely important to continue this education in a regular and disciplined manner. Because important and disciplined beginnings

become a habit only when they continue regularly. Secondary education level is the most important period in which the characters of individuals are established. The importance of environmental education in this period is undeniable. Because the habits acquired by children in environmental education in the preschool period gain even more importance in the secondary education period when the characters of the children are established (Uzun and Sağlam, 2007).

The studies of Ünal, Dımişkı (1999) and Ekici (2005) on the importance of environmental education in secondary education support this situation. Just as the environmental education given in the pre-school period is qualified, it is extremely important that the environmental education given in the secondary education period is also qualified. The elective “Environment and Human” courses offered to students in the secondary education period attract all the attention in this regard.

The environmental awareness of our students in education programs is a step towards the next years. It is important for raising people who are more sensitive to their environment. The same sensitivity is expected not only as a school, but also from the student’s environment and the courses he attends. The people who will provide this sensitivity are both the parents and the teachers of the students. This sensitivity should be shown with a joint effort. At this point, a path should be drawn together by determining the level of readiness of the ideas of everyone, students, teachers and parents for environmental awareness (Yücel and Morgil, 1999).

There are no courses on environmental sciences and environmental importance in Turkey. It is taught within the scope of other courses. Our teachers, who are at the beginning of these courses, also have a lot of work. With this practice, which has been in operation for four years, both students and teachers have made great gains (Akınoğlu and Sarı, 2009).

Education also affects children’s adaptation to their external environment. Human beings, who are social beings, want to reach this consciousness by seeing, living and experiencing. Activities suitable for cognitive structure and psychomotor development should be organized. As stated in the United Nations CRC, an education program should be implemented with the participation of children who support their development in accordance with children’s rights, considering the highest interests of children (Talay, Aslan and Belkayalı, 2010).

3.4. Environmental Education in Higher Education

With the emergence of environmental problems in the world, the responsibilities, attitudes and awareness of people, who are a factor in

environmental pollution, have started to attract more attention. When it is understood that increasing people's responsibilities and sensitivity towards the environment and environmental awareness can be a solution to environmental problems, the relationship between environmental education and sustainability has gained importance (Oğuz, Çakıcı and Kavas, 2011).

When the results of similar researches are examined, it is clear that it is necessary to put forward a local method and policy in relation to the environment in higher education. When it comes to environmental education, it is known that this concept includes many disciplines and consists of many stakeholders. These stakeholders can be teachers, students, families, non-governmental organizations, politicians, or local and national governments. A sustainable society for the environment can only be created by the individuals living in the societies having knowledge, skills and attitudes about the environment. Higher education institutions have many duties and roles related to environmental education. These tasks and roles should be supported and strengthened (Oğuz, Çakıcı and Kavas, 2011).

4. Environmental Education in Non-Formal Education

According to Ilgın (2007), the objectives of non-formal environmental education are:

- 1) The society is interested in environmental problems and is sensitive to these problems.
- 2) To be able to identify the problems in the society's own environment
- 3) The society aims to protect the environment and makes its own contributions,
- 4) To be able to solve the problems noticed by the society and to carry out positive studies for this purpose and to put these studies into concrete action.
- 5) Individuals in the society inform their environment about the problems and integrate the awareness of the existence of these problems and the need to solve them to larger masses.

4.1. Public Education Courses

Public education is necessary in order to ensure the progress of all members of the society without discrimination and to ensure the development of these individuals in all areas such as socio-cultural and economic areas that concern the society. Public education activities also contribute to the education of members of the society outside of schools (Ilgar, 2007).

Public education exists for all members of the society without discrimination. The fact that individuals in the society benefit from this education without discrimination improves the value systems in the society. These trainings not only improve the value systems in the society, but also help the development of economic life by penetrating all units of the society with the developing and changing technology. In this way, the integrity between the nation and all the social units that are marginalized in the society and are left in the corner, so to speak, is ensured (Ilgar, 2007).

4.2. In-Service Trainings

The most important point that distinguishes in-service education from public education is to ensure the development of individuals dedicated to a particular service within the framework of that service. Therefore, service education is the knowledge and skill-developing training given to individuals in the service branch so that they can fulfill their duties in the service branch properly. Thanks to service training, individuals ensure the development of their branch of service (Ilgar, 2007).

4.3. Farmer Training

The importance of agriculture in our country is too much to be ignored. The fact that we have one of the most fertile lands in the world plays a role in the serious importance of agriculture in our country. Farmers engaged in agriculture or animal husbandry can get the best efficiency from a small area with education as well as experience. For this purpose, almost half of the farmer groups in our country are subjected to farmer training by the Ministry of Agriculture and Rural Affairs. As in all areas of life, education in the field of agriculture is extremely important and a factor that increases productivity. Moreover, it is obvious how much damage the pesticides used in agriculture cause to the soil structure. Preventing unconsciously used pesticides not only increases yield, but also contributes to the protection of our world and soil. Farmer training is too important to be left behind in all these aspects (Ilgar, 2007).

4.4. Women's Education

Today, women are the most important factor in all areas, from farming activities in rural areas to the basic education of the individuals who make up the society. Therefore, a good education of a woman also means a good education of the society. Although the activities related to women's education

were ignored in the past, the impact of women on society is seen more clearly today and therefore serious importance is given to women's education. It is not possible for a society in which women are not educated to achieve prosperity and development (Ilgar, 2007).

4.5. Education through Media and Press

Press organs are of great importance in order to create social awareness on issues related to the national or local environment. In 1993, in order to examine the role of the press for the environment, 1. Press and Environment meeting was held. The main purpose of this meeting is to bring the issue of nature protection to the agenda in Turkey, to share views and to provide discussion environments about the environment, and finally to develop press dialogue. The meeting was held with the participation of the Minister of Environment, and the relationship between human and environment was examined both in our country and in the world, and policies were created on the role of the press on environmental issues and the use of mass media on environmental issues (Ilgar, 2007).

5. Objectives of Environmental Education

The main purpose of environmental education is not only to keep people at the level of knowledge, but also to create a community that knows its responsibilities towards nature, protects it within the framework of respect and strives to provide a healthy life for future generations. Individuals are tried to gain certain attitudes and behaviors through environmental education (Uzunoğlu, 1996).

6. Environmental Awareness

The awareness of the damage that people cause to nature, the need to understand the importance of nature and the need for protection, and the importance of this protection is described as environmental awareness. In order to create environmental awareness, it is necessary to teach a number of skills in order to understand the messages given by the environment and to understand the difference between these messages. It is of great importance for people to internalize these skills they have gained and to be able to use them in different environments where they can be mixed (Sakarya, 2010; Çabuk et al., 2019).

When a study conducted for the calculation of environmental awareness was examined, it was tried to calculate the environmental awareness of 200

children between the ages of three and six who were in the preschool period and attending school by using the interview technique with a pictorial measurement tool created by the person conducting the research. When the results of this research were examined, it was understood that age was an important factor. As the age of the child increased, environmental awareness also increased (Çabuk, 2001; Çabuk et al., 2019). Based on the research, it can be said that in order to gain environmental awareness, it is necessary to provide children with an environmental education designed to be appropriate for their age and to discuss the studies related to awareness in detail as the age of the children increases.

6.1. Environmental Information

When environmental knowledge is defined, it is described as the basic element that helps individuals to find solutions that can be developed against the important tasks undertaken by the environment, the relationship between the environment and people, and the damage caused to the environment over the years (Bozyiğit and Karaaslan, 1998; Çabuk et al., 2019). The main purpose of environmental knowledge education to be given to people is to provide people with basic information about the environment regarding their age and level. It is of great importance to determine the knowledge of these individuals before the information about the environment to be given to the individuals.

In the process of acquiring environmental knowledge, it comes to the fore for children to have love for the environment and respect nature, and to make practices so that they can act with the awareness of their responsibilities. In order to increase the knowledge of the environment in real life and daily lives, children need to practice a lot (Hazır Bıkmaz and Akben, 2007; Çabuk et al., 2019).

6.2. Environmental Skills

We need a number of skills to find solutions to the problems in the environment. These skills are the skills necessary for people to find solutions that they can develop against the problems experienced in nature, the reasons for their emergence and these problems (Tanrıverdi, 2010; Çabuk et al., 2019).

Another definition of environmental skills is skills that allow people to understand their position in the environment they live in and to understand that nature and human beings are a whole that complements each other (Geray, 2002; Çabuk et al., 2019). If it is necessary to explain environmental skills, it can be defined as people analyzing the information they have acquired in environmental

situations and explaining the current situation by using their own judgments while reaching some conclusions (Zareie and Navimipour, 2016; Çabuk et al., 2019).

In addition, it is necessary to determine the plans and methods to be applied in environmental situations and to mention a number of skills that should be possessed during the implementation of these plans (Karimzadegan and Meiboudia, 2012; Akt. Zareie and Navimipour, 2016; Çabuk et al., 2019).

6.3. Environmental Attitudes

Attitude, whose word origin is Latin, is frequently used in daily life. The word attitude is an abstract concept, the meaning of which is to be prepared for an action or situation. Since it is abstract, it is not possible to observe the attitudes of people. The concept that guides the behaviors that people will exhibit in their cognitive processes before they move is described as attitude (Arkonaç, 1998; Çabuk et al., 2019).

Although the attitudes that individuals will develop towards the environment do not have only a cognitive or only behavioral aspect, it is seen that both play an active role in the development of attitudes. For this reason, it is clear that the system to be used in the development of environmental attitudes should have both cognitive and emotional parts and the behavioral dimension should not be skipped (Şengül, 2001; Çabuk et al., 2019).

6.4. Environmental Participation

Environmental education from an early age has a great impact on environmental participation. Considering that people are small building blocks of the society they live in, it is ensured that they actively participate in situations related to nature and react to situations such as environmental pollution with environmental education. To summarize briefly, environmental participation can be described as individuals' primary intervention and active participation in problems in environmental events and situations (Çabuk and Karacaoğlu, 2003; Çabuk et al., 2019).

Among the studies that examine the participation of children in a number of situations that occur in the environment (Hart, 2002; Çabuk et al., 2019) concluded in their studies that children need more natural areas outside the common areas in the immediate vicinity. These studies have shown that children need diverse and natural spaces to experience nature and explore what is happening around them. In addition, it has been understood that children prefer

natural environments as the area where they will receive education. When the opinions of the children who expressed their opinions in different ways were examined, it was understood that they wanted to participate in the environment, they preferred the natural environment to artificial areas, and they wanted to have the right to speak in environmental situations. Hart explained in his study that the role of environmental participation should be mentioned with titles such as the damage to nature and the ways to avoid these damages, that is, to protect nature, apart from the issues of environmental participation and the area that children prefer to play and environmental participation (Hart, 2002; Çabuk et al., 2019).

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CHAPTER II

1. THE EFFECT OF ENVIRONMENTAL EDUCATION ON DEVELOPMENT AREAS

Since the first years of human history, people have lived intertwined with nature. They tried to turn the different situations they encountered in their favor. When humans were hunter-gatherers, they had to adapt to nature. However, since he settled down, he has tried to shape nature as he wishes. It has been understood how important nature is, especially during the pandemic process when people cannot breathe in the cities where they are stuck. To repeat these mistakes, interest in environmental education has increased in recent years. (Robertson, 2009).

All programs created for early childhood should support and develop the period characteristics holistically. According to the holistic approach, all areas of development should be considered and supported. These areas of development are physical development, language development, cognitive development, personality development, social-emotional development, and moral development. In this study, the effects of environmental education studies on development areas will be examined.

The importance of environmental education in preschool can be mentioned with different approaches. The learning of children in early childhood consists of their innate curiosity and making sense of the environment. It supports environmental education in different ways. Studies support this. It has been observed that learning is more permanent when educational practices are combined with environmental activities and the student's experience gain is supported. The effect of early childhood on the whole life of the individual is more than expected. One of the concepts that have an important place in this effect is the critical period. The more stimuli the child is exposed to during the critical period and the more experience increases, the more permanent the learning will be. The more the environment is included in these learnings, the more positive the attitude of the child towards the environment will be (Gülay, 2011).

1.2. Physical Development

Our body is the tool that allows us to first interact with the environment in which all our behaviors, thoughts, and emotions are formed. Physical development, which begins with prenatal processes, ends with death. Physical development includes not only physical growth, weight gain, and height elongation, but also the maturity of the organs to perform their functions. It is a wide area that includes processes such as the maturity of the hand and finger muscles to hold something, the development of sensory organs, and the brain. Since changes in physical development also affect the emotional world and thoughts of the individual, they can also directly or indirectly affect the way they behave (Deniz, 2018).

One of the periods when physical growth and development is the fastest is early childhood. Physical development directly affects what the child can and cannot do. Increasing the skills that the child can and can do with environmental activities is an effective way to gain the ability to actively use gross and fine motor skills. While exploring the environment, the child can try to feel the leaves of plants with his fingers, or he can crawl on the ground, and jump to imitate an animal. It tries to understand living things in nature by imitating them through their bodies and exploring them using all their emotions. All these situations can be counted among the contributions of environmental education to physical development (Shin, 2002).

1.3. Language Development

From birth, your child's environment is formed by his parents. It is very important for the parents to accept the child as an individual from the moment he is born and to give the child responsibilities appropriate to his age. The stronger and healthier the communication between the family, the stronger and healthier the relationship the child will establish with his environment. By observing his parents, the child can gain awareness of the environment and become a successful and harmonious individual who can express himself well among other people. The child's ability to express himself against other people is proportional to the attention he receives from his family. For this reason, the child should be allowed to feel the interest of the child's family towards him and to express himself to other people. When the relevant literature was examined, it was seen that children who were in healthy communication with their parents completed their language development quickly. The more the child communicates with his environment, the easier the process of acquiring the language will be.

Environmental education With environmental education, the child will discover different ways of expressing himself. They will enjoy noticing and discovering not only verbally but also other ways of communication. Thanks to environmental education, the child will realize ways to communicate not only with the people around him, but also with prayer, and he will follow these ways to the end of his life. The process that begins with the child's imitation of environmental sounds will allow him to be a consistent individual towards the environment when he becomes an adult (Kın et al., 2016).

1.4. Cognitive Development

One of the periods when developments are smart is early childhood. During this period, children's learning capacities and speeds are easier than at other ages (Gülay, 2011). Children have an innate instinct with the desire to know and learn about the environment. Especially in early childhood, they want to get to know the environment by asking questions about everything they see in the environment. As a period characteristic, children in early childhood are curious, inquisitive, and inquisitive. It may be easier for children to gain positive attitudes and behaviors about the environment in early childhood by using the characteristics of this period compared to other ages (Akbayrak and Turaşlı, 2017). In the activities to be held during environmental education, children will watch and predict using all their senses and offer solutions to the problems encountered, so that they can develop different skills at the same time. They will extend their attention span even more thanks to observations and their attention span will increase, they will observe the environmental problems themselves and they will want to apply the solutions they have produced for these problems, and their problem-solving skills will develop spontaneously (Pamuk, 2021).

Environmental education to be given in early childhood, taking into account the characteristics of the period, will contribute to the cognitive development of children. With the science education activities to be applied in the preschool period, it can be ensured that they develop a positive attitude towards the environment. Children who are quite curious at this age ask a lot of questions. Children can be encouraged to explore the environment in response to the questions they ask. The child can reach the answer to the question he asks by watching and exploring nature, which supports all areas of development. Even simple examples, observing seasonal changes, expressing the changes in the air, soil, and water in the classroom environment, seeing the habitats of different living things, or even a simple activity in the classroom can increase children's

interaction with the environment and make them perceive the environment more positively. Although studies show that children have a positive attitude towards the environment, it is understood that this attitude is relative. When we look at the curriculum, environmental education comes to the fore in secondary school and higher grades. Environmental education in early childhood education is very limited. The more activities to be carried out, the more possible it will be to change the attitude towards the environment (Taşkın and Şahin, 1996).

1.5. Social-Emotional Development

In his social learning theory, Vygotsky talks about the effect of the interaction of individuals with their environment and that this effect develops together with the child's social environment in learning. Vygotsky mentioned that children can learn about the environment as a result of play and their own experiences, which is the most natural way of learning (Erol, 2016).

The effects of environmental education on the social-emotional area can be listed as follows; They can learn to take responsibility by repeating certain behaviors and with an awareness of protecting the environment. They can gain the ability to be a conscious consumer by using only as much as they need. By doing all this, they can learn to empathize by thinking about the things that are affected by the outcome of their behavior. Thanks to the different environments they will encounter during environmental education, they can learn to adapt to situations and people they are unfamiliar with. With the activities to be held, children can realize and protect the rights of not only people but also all beings by thinking about the right to life of every living thing how they should respect this right, and what they should do to protect this right. They can gain the skills to cooperate with games and other activities: Grow up with this philosophy, and when children become adults, they can fulfill these responsibilities as adults and create new ideas and feedback (Pamuk, 2021).

1.6. Personality Development

Many theorists talk about the importance of providing environmental education with environmental activities suitable for the child's age and its positive effects on the child. Some of the theorists include Montessori, Froebel, Pestalozzi, and Rousseau. According to Montessori, exploration and liberation form the basis of the education to be given to the child. The environmental arrangements that adults will make should be according to the child so that the necessary environment for the child can be ready. It is also very important for adults to guide the child.

According to Montessori, the environment should be equipped with items prepared according to the height of the child and the child should learn by exploring himself with appropriate items in a free learning environment. The most important task of the teacher in this education is to guide the child. Similar to Russian water, Montessori talks about the importance of educating children freely in their way by exploring nature. Thanks to this interaction with the environment, there will be an increase in the interest and care they show to plants and animals. Observing the growth of a plant can teach a child to be patient and wait. In the same way, a child who closely observes the growth conditions of a plant or living thing will feel love, sympathy, and respect for their life. In the same way, the child who takes care of these plants and animals also has a prediction about their lives (Akçay, 2006).

1.7. Moral Development

Man is a social creature. From the moment we are born to the moment we die, our interaction with the environment continues. Some skills necessary to live in society must be acquired. While gaining these skills, our first interaction is with the parents. Skills that are externally controlled and acquired as a child begin to internalize as they grow up. This internalization is considered to be the basis of moral development. Moral development is one of the subjects studied with different aspects. It is possible to support moral development with activities for environmental education. By doing the right thing for the environment, we support the moral development of children, regardless of the circumstances. Separating garbage to keep the environment clean, protecting and feeding stray animals, and doing all this only for the environment are incompatible with the universal moral district, which is one of the Kohlberg moral development principles (Dilber, 2016).

1.8. Physical Development

Biological development is divided into two physical development and psychomotor development, physical development is more concerned with quantitative data such as growth, height, weight gain, and game extension, while psychomotor development refers to reaching the maturity to gain a skill. It is important to support children in terms of biological development in environmental education studies. The first purpose of education is to raise the individual as an adult capable of doing his work independently. Thanks to environmental education, the biological development of children can be supported with walks and other activities that will take care of the soil. As a cleaner environment,

cleaner air, and healthier food conditions are provided, it can be made possible for future generations to grow up safer (Kuğuoğlu, Kürtüncü Tanır, 2006)

1.9. Sexual Development

The first natural environment that children encounter consists of their parents. Over time, the child observes that the mother and father have different duties in this natural environment. He discovers that he is also from his mother or father's gender group. He identifies himself with his same-sex parent. By acting like him, he learns the gender roles that must be conformed in society. Healthily getting through this process has a great place in preventing bigger problems that may occur in the future. In divorced families, the child Sometimes cannot find a parent to identify with. This confuses terms of gender roles. Children's sexual development can be supported by working for the environment to be built. The environment will discover its identity and will be able to accept itself by observing the roles that are appropriate for it (İşler, Gürşişek, 2018; Kardeş, Güney Karaman, 2018).

1.10. Aesthetic Development

In aesthetic practice, it is the feeling of satisfaction that people feel towards what they see as beautiful. It is possible to develop what man naturally exists in. In preschool education, which is the first educational institution that children encounter, aesthetic and art education has a special place. Especially with environmental education studies, that aesthetic can be further developed. Activities such as examining the veins of a leaf that the child takes in his hand, looking at a flowering tree in spring, and observing animal movements in natural life develop the aesthetic sense of the child at birth. Thanks to the developing sense of aesthetics, the child will want to observe his environment more carefully and will feel the need to regulate his environment with the responsibility brought by this feeling (Özbal, Aydoğan, 2017).

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CHAPTER III

1. DEVELOPING ENVIRONMENTAL AWARENESS AND SENSITIVITY IN EARLY CHILDHOOD

1.1. Sustainability

The concept of sustainability first emerged in 1987 with the report called “Our Common Future” published by the World Commission on Environment and Development within the United Nations. In this report, sustainability is defined as maintaining the continuity of diversity and productivity, while maintaining its ability to be permanent. At the same time, sustainability is defined in the report as “having the ability to sustain development by providing daily necessities without harming nature’s ability to meet the needs of humanity and future generations.” The aim is to fulfill the responsibilities towards nature by making nature and the environment sustainable. Even if human beings are open to technological developments, they are a part of nature in every aspect. However, although the resources offered by nature are non-renewable, they are the most preferred products in all areas of life (Aydede, Devci, and Gönen, 2019).

The concept of sustainability, which has increased in importance in recent years and has been frequently on the agenda, is derived from the word “sustinere” and means ensuring continuity and protecting its existence (Onions, 1964; akt.: Ergün and Çobanoğlu, 2017). Sustainability states that while meeting the needs of people living over time, economic, social, and environmental integrity should be ensured to ensure continuity and to benefit from these resources in future generations, without forgetting that resources have limits (Köşker, 2020).

1.2. Sustainable Society

Sustainability can be described as a whole that expresses the vitality of the interaction between the environment and society, rather than a feature of the environment or society. Sustainability is generally perceived as the protection of nature to raise the living standards of society. However, the main purpose of the

concept of sustainability is not to protect the current state and order of society but to shape the current practices in interaction with the environment in a way that will allow future generations to lead a life intertwined with nature (Becker, Jahn, Stless, 1999; akt.: Güler, 2019).

In 1992, the basic principles of sustainable development were mentioned at the United Nations Conference on Environment and Development in Rio de Janeiro, and two of these principles that are important for future generations are as follows (Gökmen, 2014):

- Everyone has the right to live a healthy and productive life in harmony with nature.
- Present and future generations have this right equally.

In international declarations on environment and development, it is emphasized that we have responsibilities towards future generations while creating our current living standards in nature. The current life order mustn't adversely affect the bond that the next generations will establish with the environment. It is essential to become sustainable societies to maintain the natural balance by maintaining vitality. To create sustainable societies, first of all, people need to determine the boundaries together and organize living spaces by considering these limits. Some criteria have been determined for the creation of sustainable societies, these are (IUCN, 1991; akt.: Güler, 2019);

- Respect and sensitivity to living life
- Improving people's quality of life
- Preservation of the vitality and diversity of nature
- Reducing the consumption of non-renewable resources
- Consideration of the bearing capacity of the earth
- Changing personal attitudes and behaviors
- Ensuring the sensitivity of societies to the environment they are in
- Establishment of a national legal framework for the development and conservation process
- Creating a universal collaboration

When the criteria are examined, it is revealed how individuals and societies in general should act. To achieve sustainability, it is necessary to become a sustainable society first. To achieve this, people need to be able to organize their living spaces according to the needs of society and nature by breaking

the patterns they have in their attitudes and behaviors (UNESCO, 2002, Cited.: Güler, 2019). In this way, people's one-sided interaction with nature can become a mutual nourishment that can benefit them (Güler, 2019).

Many researchers on the subject have stated the importance and value of environmental education, especially in ensuring sustainable development, which can be defined as ensuring the continuity of existing resources in nature and transferring them to future generations (Otto and Kaiser, 2014; Otto, Kaiser and Arnold, 2014, Cited.: Yılmaz Yılmaz Bolat, Gölcük, 2020).

1.3. Ecology

On the planet we live on, the processes of life continue in living environments called "ecosystems". The word ecosystem was first expressed by the British Ecologist Sir Arthur G. Transley in 1935 to express the relationship between all living and non-living beings in a certain environment. The ecosystem can generally be described as the home and shelter of living beings living in a certain natural region (Özdemir, 2017).

The branch of science that investigates ecosystems is called "ecology". The founder of modern ecology is the German biologist E. Haeckel, who lived in the 19th century. Haeckel defined ecology in 1869 as a branch of science that examines the teaching of nature's budget. Since 1869, ecology has been a branch of science that investigates the complex interaction between living and non-living beings in a living environment and deals with its teaching (Özdemir, 2017).

1.4. Ecology-Based Environmental Education

The general purpose of environmental education projects is to evaluate nature itself as a laboratory environment and to express scientific knowledge about the environment in an up-to-date language; to learn the order and language of nature by doing activities based on experience in the natural environment. In this way, it is aimed for individuals to learn and internalize the concept of sustainability and to take more active roles in environmental issues and solving environmental problems. In addition, individuals share the knowledge and experiences they have gained in their family, social and business lives with the people around them; it is aimed to influence these people to take an active role in solving environmental problems (Okur, 2012).

Environmental education, which is given in the abstract away from the natural environment in educational institutions, prevents people from developing awareness of the natural environment and perceiving nature holistically. The

conclusion reached in a study conducted in Israel and the Netherlands is that too much information given on environmental issues is not very related to the attitudes and behaviors shown to the environment, that is, even individuals who have a lot of knowledge about the environment cannot show positive attitudes and behaviors (Dreyfus, Wals, Van Weelie, 1999; akt., Berberoğlu Okur, 2015).

Environmental education studies and nature education applied outside of educational institutions help children to make sense of the relations between different fields of science and to comprehend the subjects in the curriculum more effectively (Erdoğan, 2011).

For the effectiveness of environmental education, out-of-school and in-school planning and practices should support or continue each other. In a quality environmental education program, children's activities should be well planned and children should regularly engage in extracurricular activities. As children comprehend the positive and negative effects of the functioning of ecosystems and human interaction on the continuity of these systems, they will strive to behave more responsibly towards nature (Çakır, 2016).

According to ecological thought, human beings identify with nature, find themselves in nature, and take care to regulate their behavior in this direction by caring about the wishes and interests of nature as much as they think about their wishes and expectations in their relations with nature. The properties of the natural environment can only be learned when interacting with it. Environmental education, which is considered with this idea, is important in terms of increasing children's interest in nature and enabling them to look at their lives by establishing an empathy relationship with nature when it is realized with practices in the natural environment (Atasoy, 2006; Ozaner, 2004; akt: Çakır, 2016).

Environmental education based on ecology is one of the best methods that increase people's scientific learning about the natural environment. Well-planned environmental education applied in out-of-school areas will make it easier for children to understand the natural environment as well as help them gain positive attitudes and behaviors towards the environment and nature.

It is stated many researchers that the application of environmental education in touch with nature, even for a limited time, allows individuals to have information about natural life processes, increases their tendency to nature, makes them more conscious and sensitive, and supports them to be more free, critical thinkers and creative people (Demirsoy, 2004; Palmberg and Kuru,

2001; Phenice and Griffore, 2003; Thoe and Lin, 2006; Burn, 2006; Ozaner, 2007; akt., Güler, 2009).

Expressing environmental education as “learning the language of nature”, Ozaner states that this education applied in nature has radically changed the perspective of those involved in education towards life, the universe, and events, even if its duration is limited. An environmental education based on ecology is one of the best methods that contribute to individuals’ learning about science and the environment (Ozaner, 2004).

1.5. Early Ecology Education for a Sustainable Society

Environmental education in early childhood is very valuable because, in the phenomenon of urbanization, children live away from nature, environmental problems continue to increase day by day, and the acquisition of skills such as classification and observation in practices to be made with environmental education in a fun way appeals to the children of this period (Gülay and Ekici, 2010).

Since the basis of the habits and values we acquire throughout our lives begins to form in the first years of life, nature and environmental education must begin in childhood to achieve maximum effect (Russo, 2001; akt.: Erdoğan, 2011). In this period, children can recognize their environment and make associations between situations and events at an early age. Thanks to these relationships, they can make sense of the natural environment. In addition, the foundations of the attitudes that adults will have begin to take shape at this age. As Gökler and Yılmaz (1999), think that environmental education and nature education in the early stages will have many positive effects on the development of children, it will be easier to make sense of abstract concepts by using the concepts related to the environment and nature by doing-living and game-based learning-teaching methods (Akt.: Erdoğan, 2011). Doğan (1997) emphasizes that the environmental and nature education studies in the education program for this age period should be handled from concrete to abstract and applied in nature and by living by doing.

There is the principle that the natural environment creates a living model in environmental education practices for children and that more permanent learning can be achieved by directly interacting with the phenomena and events that are going on in nature (Başal, 2003; akt.: Özdemir, Uzun, 2006). Children’s ecological personalities are formed in parallel with active experiences in natural environments; it is stated that this has positive effects on the moral and cognitive

development of the child (Elliot, 2003; akt: Özdemir, Uzun, 2006). Similarly, it is emphasized that the best way for children to learn is through experiences that allow them to actively use their various senses, and in this way, they gain permanent knowledge about their environment (Wigg, 1987; akt: Özdemir, Uzun, 2006).

Educational environments should enable children to interact directly with nature and gain rich experiences that allow them to make discoveries and reach synthesis by using their different senses as effectively as possible. With these studies, educational practices based on direct interaction with natural structures are implemented to comprehend phenomena such as the characteristics, diversity, and relations of living and non-living beings in nature, the bond between living beings and inanimate environments, the food and energy chain, substance transformations and decomposition (Illinois Environment Protection Agency, 2003; Tempel, 2005, Cited.: Özdemir and Uzun, 2006). With these studies, educational environments become a productive life experience where children can observe and comprehend ecological processes in their natural environment by getting rid of closed classroom activities and the limitations of the classroom environment (Özdemir and Uzun, 2006).

It is of great importance for the new generation to cope with the problems of global warming and climate crisis, which they have inherited from the very first time of their lives, and to adopt a life in harmony with them. It is very valuable for a sustainable future for children to be able to comprehend the consequences of our daily attitudes and behaviors that affect other people, animals, and plants around the world. Thus, the next generation will understand that they need to be more effective and sensitive to protect the natural resources on our old planet and will exhibit appropriate behaviors (Akyol, Kahriman Pamuk, and Elmas, 2018).

Samuelsson and Kaga (2008) summarized how educational practices should be for sustainability in the preschool period as follows:

- Children take part in sustainability plans as active participants and beneficiaries. Training content and approaches prepared for sustainability should be planned by taking into account their perspectives.
- Early childhood education for sustainability makes more sense than environmental education. Children should be given opportunities to express their thoughts by having conversations about right or wrong thoughts about sustainability and protecting our nature through concrete behaviors. The 7 basic

elements of education for sustainability (reduce, reuse, recycle, share resources equally, respect, reflection, and questioning) provide convenience for the concretization of practices in the preschool period.

- Considering that different societies and ethnic structures are increasingly living together in the globalizing world, accepting the diversity between people and cultures and respecting the differences is one of the achievements that are laid out in the preschool period. Children form their own identities based on the culture they live in. Education for sustainability allows children to gain a unique identity with solid foundations in the culture they live in, while also allowing them to become citizens of the world.

- Education for sustainability enables children to think critically and come up with new, creative solutions and alternatives to unsustainable habits and practices that currently prevail in humans. Young children should be allowed to think critically about unnecessary and excessive consumption of food products, toys, clothes, and advertisements they use throughout their lives, and they should be encouraged to question (Akt.: Temiz, 2021).

2. Environmental Awareness and Sensitivity

The concept of environmental awareness, which is used in many fields such as sociology, politics, economics, and science, is coming to the fore more and more day by day and its importance is understood. Protecting the environment as the area where all living things on earth live their lives and making it livable can be achieved by creating environmental awareness. The purpose of creating environmental awareness in people; is to know the environment, and to gain beneficial behaviors and positive attitudes toward the environment. An environmentally conscious individual is an individual who adopts environmentally friendly behaviors, as well as an individual who is impartial to the damage to the environment, does not remain unresponsive, does not think about his interests, and does not turn his interests into ambition (Karatekin and Merey, 2015; Erten, 2004).

Countries should carry out activities and make efforts to create environmental awareness, and environmentally sensitive individuals who can take responsibility should be brought into society. Laws are regulated in many countries to support the protection of the environment, however, the protection and development of the environment is adopted as both a voluntary and constitutional duty that requires the active behavior of both states and individuals (Onur, Çağlar and Salman, 2016).

The basis of the attitudes and behaviors of an adult is laid in the preschool period, that is, in early childhood. Therefore, education for the environment, which aims to gain positive attitudes and behaviors towards the environment in individuals, is a process that should be planned at every stage of the education process and throughout life, starting from early childhood education. Education alone with nature, which Froebel, Rousseau, and Montessori attach importance to and insist on, is an important phenomenon in early childhood education for the child to gain sensitivity to nature, plants, animals, and the order of nature and to learn to live in harmony with nature (Akçay, 2006).

The aim to be achieved in environmental awareness, as many scientists have emphasized, is environmental knowledge, a positive attitude towards the environment, and beneficial behavior towards the environment. We can briefly explain these achievements as follows:

2.1. Environmental knowledge: It is all information about environmental problems, solution strategies sought for problems, developments in ecological fields, and the environment.

2.2. Attitudes towards the environment: It is all of the negative or positive thoughts and attitudes that individuals show towards behaviors that are beneficial for the environment, such as anger, fears, value judgments, restlessness, and readiness to solve environmental problems, which are based on environmental problems.

2.3. Behaviors that are beneficial to the environment: These are sincere and sincere behaviors shown to protect the environment. Such behaviors are described in the literature as environmentally beneficial or environmentally friendly behaviors (Erten, 2004).

Today's environmental problems not only threaten human existence but also disrupt the balance of nature and cause our world to become uninhabitable. The most powerful way to put an end to this catastrophe that awaits humanity will be to abandon people's current thoughts and behaviors in the present time and the future. For this reason, individuals have to do their part to find solutions to existing environmental problems without wasting time. Today, environmental problems are not a problem that can be solved only by technology or laws. This is only possible if people change their behavior. Changing behaviors necessitate a change in knowledge, attitudes, and value judgments. Gaining positive

attitudes and value judgments towards the environment can be achieved through environmental education (Erten, 2004).

3. Developing Environmental Awareness and Sensitivity in Early Childhood

Attitudes and behaviors, the foundations of which are laid in early childhood, will form the permanent personality structure of the adult who will form the society. From a developmental point of view, early childhood includes the periods when children are curious about their environment willing to gain experiences, and have the highest potential to develop new behaviors and attitudes. In this context, quality environmental education programs to be implemented in the early years will make a great contribution to giving children positive attitudes, behaviors, and habits about the environment. Many researchers state that environmental knowledge and attitudes towards the environment begin to be formed and shaped in the preschool period and that the environmental awareness acquired in the preschool period has a great contribution to the development of a positive attitude towards the environment in later ages (Ogelman, H.; Smith, 2001: 18; Taskin and Sahin, 2008: 1-14; akt; Cakir, 2016).

Well-planned, out-of-class environmental education activities will not only facilitate children's perception of the outside world but will also enable them to gain positive attitudes and values towards the environment and nature. It is stated by many researchers that environmental education allows children to gain knowledge about natural life processes, albeit in a limited time, increases their tendency to nature, makes them more conscious and sensitive, and contributes to them becoming more independent, creative, and critical thinkers (Demirsoy, 2004; Burn, 2006; Ozaner, 2007, Cited., Çakır, 2016).

The main starting point in this process is to introduce animals, plants, and inanimate components that makeup nature, to increase interest in them, and to prevent fears and phobias against animals in gaining environmental awareness. Many researchers have concluded that individuals who are interested in animals and plants in childhood and have childhood experiences in nature are more sensitive to environmental problems in their future lives than people who do not have these experiences in their childhood (Erten, 2004).

It is possible to say that the raising of generations that have gained environmental awareness, protect the environment, and are sensitive to environmental issues can be realized with well-planned early childhood

environmental education programs that are actively implemented in the education process (Potter, 2010; Wells and Lekies, 2006, Cited.: Yılmaz, Yılmaz Bolat, Gölcük, 2020).

Wilson (1994) explains environmental education in early childhood with two major reasons (Akt., Yoleri, 2012).

- The first of these is that in the first few years of life, it is critical to gain a sense of respect and care for the natural environment. If it cannot be won, there is a risk that it will never develop such an attitude.

- Secondly, positive interactions with the natural environment are an important building block of a healthy childhood. Quality processes spent in childhood in the natural environment greatly increase the quality of learning and life in the future life of the person.

Children who are in contact with nature tend to show interest in their surroundings with feelings of joy, fear, and wonder. Another view that emphasizes the importance of environmental education given at an early age is that children also need nature, and it is necessary to establish a healthy interaction with the natural environment for healthy development in childhood. Humans need to interact with nature not only because of material needs but also because of psychological and emotional needs (Carson, 1956; Cobb, 1977; Crompton and Sellar, 1981; Miles, 1986, 1987; Patridge, 1984; Sebba, 1991; Wilson, 1992; Wilson, 1993, 1994, Wilson, 1996, Cited.: Yoleri, 2012).

When the studies in the literature are examined, it is seen that there is a high relationship between the interaction and practice-based experiences with living and non-living things in nature and children's perceptions of the environment. In this context, it is stated that the active learning method is more effective than passive learning, and experiencing nature alone is more effective than indirect environmental education in shaping children's perceptions of the environment (Phenice and Griffore, 2003, Cited.: Özdemir and Uzun, 2006).

The goals to be achieved through environmental education in early childhood are stated by Haktanır (2007) as follows (Akt.: Çakır, 2016):

- **Awareness:** To help children gain awareness, sensitivity, and positive attitudes towards the natural environment and environmental problems, to develop their discrimination skills by perceiving stimuli, and to assimilate

and develop these perceptions in the process, allowing them to use the newly acquired skills by transferring them to different areas.

- **Knowledge:** To help children gain a basic understanding of the characteristics and functioning of the environment, the relationship of people with the environment, the reasons for the emergence of issues and problems related to the environment, and how solutions are reached.

- **Skills:** To help children conduct research to identify environmental problems and develop the skills necessary to contribute to the solution of these problems.

- **Participation:** To help children gain experience in using the necessary knowledge and skills to develop positive behaviors to produce solutions to environmental issues and problems with a conscious and sensitive perspective.

We can summarize the importance of environmental education in preschool education programs as follows (Başal, 2005, Cited.: Çakır, 2016):

- **Environmental education is important for individuals themselves:** The natural environment not only inspires individuals and enables them to live peacefully and happily, but also supports one's mind and personality.

- **Our planet is deteriorating due to human effects and needs new generations to find solutions to the emerging ecological problems:** To raise generations that are sensitive, respectful, and environmentally conscious towards nature; The importance and methods of protecting the continuity of the ecological order in the best way and how to live in harmony with the system should be taught at an early age.

- **Since nature itself is a model, it forms a core in educational programs:** Concepts such as birth, growth, and death are biological events in the life cycle that attract the attention of children and are very curious. In addition, observation, classification, and communication skills, which increase the success of the child in educational life, can be supported by interacting with the natural environment.

Many studies have shown that environmental education practices have a positive effect on the development of children in many areas when planned in harmony with nature. It is emphasized that interactive experiences with nature are directly related to children's perceptions of the environment. In this regard, Bogner (1998) and Bögeholz (2002) have shown that environmental education programs implemented outside educational institutions increase children's

environmental knowledge and positively increase environmental behaviors. Kals et al. (1999) determined that environmental education, which is mainly applied to nature experiences, positively and greatly affects children's affective affinity, curiosity, interest, and behavior towards nature. Bogner and Wiseman (2004) state that environmental education practices based on natural experiences increase children's environmentally protective behaviors on the one hand, and regress their one-sided utilitarian perceptions of the environment on the other (Akt.: Özdemir, 2010).

Wilson (1996) stated that some issues need to be considered in the planning and implementation stages of environmental education studies in the preschool period (Akt.: Ogelman and Güngör, 2015).

- Environmental education should be started with easy activities where children can feel safe.
- Children should be supported to be active in applications.
- Children should be given experiences that they enjoy and can remember in the future. It is as important for children to enjoy environmental practices as it is for them to be enjoyed.
- Environmental education is as valuable as education in experiences.
- Environmental education should be able to appeal to all the emotions of children.
- More than one method and technique should be used together in educational applications.
- Children should be taught to understand that all components of the world interact and are together.
- It should be a model to make children interested in the natural world.
- Applications should be carried out in a warm and friendly environment.
- Different cultures and perspectives should also be addressed in environmental education.
- It should be ensured that they can pay attention to the perfection and beauty of the natural environment.
- It should be possible to spend time in the natural environment as much as possible. If children want to be inspired with a sense of love and curiosity about the environment they live in, this should be done by allowing them to interact with the environment at every opportunity.
- Environmental education should be integrated into the preschool curriculum and implemented.

- It is thought that the best learning in early childhood is gained through play, and play should be actively used as a learning tool.
- The interaction of the child with his natural environment should facilitate his mental, physical, and emotional participation.
- Understanding concepts and analysis-based learning should be carried out rather than learning based on memorization and patterns.
- Daily practices should be made to ensure the interaction of children with natural elements such as different animals, plants, soil, and water.
- The development of cooperation, cooperation, and social interaction among children should be ensured.
- Families should be included in the process along with children in environmental education practices.

We must leave our beautiful nature, which is entrusted to us, to the next generations in a livable and healthy way. Today's children, as the adults of the future, are the trust that we support their achievements and learning, and that are the guarantee of our future. For this reason, it is one of our most essential responsibilities to ensure that our children are conscious and sensitive to the environment. In this context, the more effectively and early we can bring environmental awareness to our children, the more we will guarantee our nature and future (Kuzu, 2008).

4. Natural Tools That Can Be Used in Ecologically-Based Environmental Education in Early Childhood

In addition to the aim of creating a sustainable nature, environmental education in the preschool period also includes time full of exploration and learning in the natural environment, such as children playing games by wetting their feet in a puddle, exploring forest areas, building houses using mud, stones, sand or pieces of branches, climbing cliffs, running over grass, following insects and understanding their characteristics. Children can establish a bond with nature through these experiences (Kahriman Pamuk, 2021).

4.1. Plants

Plants have a very important place in environments where environmental education is applied and intertwined with nature. Plants can be used as a play tool in nature where children can develop many motor skills such as climbing,

jumping, and hiding that will support their muscle development. In addition, plants play an important role in children's curiosity about the natural environment by giving children the opportunity to touch and collect their fruits, flowers, and leaves. It helps the child to learn by experiencing biological events such as seasonal color changes, pollination, flowering, budding, and seed formation that occur in plants in the environment he interacts with, by revealing the sense of curiosity that comes from his creation, learning new information about natural processes and nature, establishing cause and effect relationships and comprehending the life cycle in nature. By hearing the names of plants and all living things in the natural environment with intrinsic motivation, the child will develop vocabulary and gain permanent pre-learning throughout his education life. By making observations, exploring, touching, smelling, and hearing will use their different senses effectively and spend time enjoying themselves in multifaceted complex processes. The natural environment and plants will also contribute a lot to the artistic development of children. The child will explore the textures by touching the leaves, flowers, and stems of plants of different colors and textures. They will know the sun, shadow, color, color tones, and beautiful smell by experiencing them in the natural environment (Turgut and Yılmaz, 2010). A seed planted in the ground will learn to wait patiently, observing its gradual emergence from seed and germination. When the child learns in nature that the survival of a plant he has planted or planted depends on his care and effort and that an animal waits for the food it will give him when it is hungry, he will begin to understand that he has duties in the life process (Çakır, 2016).

Motor skills, especially in children aged 3-6, form the basis for advanced motor skills. In these years, children discover their movement potential such as holding small objects, squatting, jumping with both feet and one foot, and running on tiptoe (Tepeli, 2021). Games such as hiding leaves, and climbing, in which children can play by using plants, will be very important in terms of supporting their motor development (Turgut and Yılmaz, 2010).

4.2. Water and soil

Water containers in different volumes and shapes can be used during planned activities for early childhood children. Games created using water will help children relax and contribute to the development of their motor and emotional skills. Soil, sand, and water are the basic play materials that can be used starting from the 24th month. Providing the child with the opportunity to play with a basin full of water or a sandbox will support his mental development

as well as his physical development. At the same time, this helps the child gain a sense of confidence. As a result of the observations, it was determined that the attention span of children playing with water was longer. In cities with high population density, children need to come into contact with natural materials such as water and soil and play to relax. Psychologists also state that vandalism is more common in cities where concreting is very intense. In particular, park and garden designs in which water is used have positive effects on the environment (Ünal, 2009).

When playing in the natural environment, children will spend time with long-term pleasure when they play with water. In addition, children will be able to grasp some laws of physics without being aware of them through latent learning while playing. For example, by exploring the different states of matter in their games, they will understand that water changes to liquid and gaseous states as the temperature decreases to solid. They will observe that liquids appear in different shapes in containers of different shapes. For example, a child who builds a pool using water and soil or tries to build a dam by piling soil in front of the water will learn by experiencing the effect of water pressure. Children who build castles with blocks and shapes made of water, soil, or sand will be able to balance and comprehend their carrying capacity (Turgut, Yılmaz, 2010).

4.3. Insects and animals

Many animals living in the natural environment are helicopter beetles, butterflies, ants, worms, fireflies, rabbits, birds, lambs, and many others that arouse children's curiosity and interest when they encounter them in nature. By observing how an ant takes food to its nest, by looking at a firefly or a helicopter fly, the child will provide very important gains for his student years and perhaps for the scientific studies he can do at later ages (Turgut and Yılmaz, 2010).

4.4. Inanimate materials

Throughout the growth and development processes, human beings perceive the world with their own experiences, change it, observe these change processes and their results, and reach learning through all these experiences. Children need to interact and manipulate their environment. To offer this opportunity to the child, space, and materials should be provided to the child to create new structures with inanimate materials such as gravel and sand in the playgrounds. Sand is very necessary to support children's ability to shape and change their environment (Öztaş, 2002; akt.; Turgut, Yılmaz, 2010).

During the play period, children are very interested in collecting some materials by collecting them. Especially dried leaves, colored stones, and seashells attract the attention of children. They communicate by showing each other the materials they collect and gain significant gains for socialization. These striking materials, which they are interested in at a young age, are also a kind of foreknowledge for science fields such as biology, geology, and botany in their later lives (Turgut, Yılmaz, 2010).

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CHAPTER IV

1. ECOLOGY AND FAMILY ATTITUDES AS ROLE MODELS

The family, which constitutes the smallest unit of society, is at the basis of every phenomenon that concerns society. There are no conscious behaviors in the influence of society on the family nor in the influence of the family on society. The two phenomena affect and change each other over time. Undoubtedly, one of the most influencing factors of environmental education studies, which is a necessity due to changing environmental conditions, is the reflection of families and the attitudes used by families while raising children on the child. (Akman and Güler, 2014; Kaya, 1997).

The child begins to be affected by his environment while still in the womb. Many factors affect the attitude of the family towards the child, such as whether the mother is ready for the baby, and her emotional readiness to be a mother. Some indirect and direct factors such as the mother's healthy diet and the balance of her emotional state during pregnancy affect the baby while she is still in the womb (Eksi, 1990).

It is important for the family to know the characteristics of the period the child is in and to know how to support the child developmentally. The period in which Montessori assimilates the essence of the culture in which she was born, which she calls the "Absorbent Mind", takes place between the ages of zero and 6 (Montessori, 1995).

It is possible to see the reflections of the attitude of adults towards children in the self-concept developed by children. The child, who is constantly humiliated, who is in an environment where his personality is criticized instead of his behavior, and whose good behaviors are not supported, loses all interest in his environment over time. And it cannot provide the necessary internal motivation to be a good person (Güenalp, 2007).

Although parental attitudes are frequently included in educational studies, their impact on environmental education is still one of the current issues. Although there are different classifications, the attitudes of parents are to be examined; Authoritarian family attitude, Democratic family attitude, Overprotective family attitude, and Indifferent family attitude. It is very important to change the

attitude of the family as well as the children positively with the environmental education activities we will do. We can reduce the negativity of the attitudes that will be explained below and the difficulties experienced by children due to family attitudes through environmental education studies.

Authoritarian Family Attitude

In the authoritarian parental attitude, all authority is the mother and father. In families with this attitude, the rules set by the parents are insurmountable, they cannot be objected to under any circumstances and their opinions are not expressed. In these families, it is very difficult for the child to exist as an individual. Because the child is punished psychologically or physically for his mistakes. Children raised with this attitude have low self-esteem and confidence, and high anxiety levels (Güngör, 2015; Şahin, Sak, and Atlı, 2015).

The attitude of authoritarian parents also does not matter the opinions of the children. No child's opinion is not taken into account and their wishes are not taken into account. The child has to follow the rules set by his family without objecting to any rules (Eksi, 1990).

The expectations of parents with this attitude are above the potential of the children. What the family expects from the child is that he is successful under all circumstances. Since the family's expectations are too high, the child cannot meet these expectations no matter what he does. Unable to meet the expectations, the child gradually loses his self-confidence. Over time, they become individuals with a high sense of worthlessness who cannot express themselves (Tuzgöl, 1998).

In the authoritarian parental attitude, the family is constantly Punitive and restricted, and when children are constantly pressured to follow the rules and behave appropriately, it has very negative effects on the social development of children. Children are hesitant to express what is right or wrong for them. True, they prefer to remain silent because they think that they will not be taken into account or that what they say will be criticized (Yavuzer, 2003).

This attitude negatively affects not only Social Development but also all areas of development. It can have very negative consequences, especially in terms of personality development. Again, it is very difficult to support some critical periods in early childhood, such as language development, in this attitude (Cüceloğlu, 2002).

In this attitude, the child is punished for his wrongdoings. Regardless of the type of punishment to be given, the child will also arouse anger and anger

in him instead of making him misunderstand. As the punishments increase, the child's self-esteem will decrease, his negative feelings towards his self will increase, and he may become an adult who does not object to authority no matter what happens in the future, or he may become an adult who is constantly fighting against those around him, does not listen to those around him, and whose only purpose is to defy authority. In particular, fathers are made a power figure in the home environment and the child's behavior is constantly monitored externally. The stress and anxiety on the child will gradually increase and cause him to have negative feelings towards his own family but never be able to express them. (Yesilyaprak, 1989).

Considering the above effects, a child who grows up with an authoritarian parental attitude may naturally change the negative feelings he has acquired towards himself during environmental education. As the child sees that Doğan embraces everyone no matter what, he will gradually try to accept himself and express himself within Doğan. Of course, these attitudes make it difficult for children to acquire a positive attitude towards the environment, but over time, prejudices against themselves will help them to do so (Tuzgöl, 1998).

For a child who grows up with this attitude, the environment ends where his parents draw the boundaries for him. He doesn't think about the consequences of something he does for the environment. Whether it's good or bad for the environment, as long as the rules are followed, it's fine. However, within the scope of environmental education, the student must take the consequences and responsibility for some behaviors himself. Thus, the child can gain the behaviors he needs in daily life with environmental education.

1.2. Democratic family attitude

The democratic attitude, which is the attitude in which the child exists as an individual and can express his opinion, is the only positive attitude among all other attitudes. In this attitude, when the child is criticized, he is evaluated not by his personality, but by his actions. Their opinions are taken into account in decisions made within the family. The family's actions and words are consistent. In addition to knowing that the child is loved and supported by his family, he is aware of the responsibilities he has to perform. Children who grow up with this attitude are self-confident and self-expressive children (Yavuzer, 2015).

In the democratic attitude of parents, the family supports the child under all circumstances. Communication between the family is quite strong. Communication is established with a positive attitude towards the child. In this

attitude, the wishes and suggestions of the child are taken into account. In this attitude, the child is aware of what the family wants from him, and the family's wishes do not go beyond the limits of the child's age and capacity. In democratic families, tolerant decisions are made with a reassuring and supportive attitude, decisions are always included in the child. The child is given responsibilities in line with his age and capacity. (Self-confidence, 2001).

Although the rules are not as strict as in the authoritarian attitude, they are also present in this attitude. However, while these rules are set, they are set to support the development of the child by taking the child's opinion. Thanks to the positive attitude of the parents, the child becomes a Self-Confident person with a positive self-perception. Children who grow up with this attitude are not afraid to make mistakes, even if they make mistakes, they are aware of making up for their mistakes and taking responsibility for the mistake. They approach the people around them with a sense of responsibility, are aware of their rights and freedoms as well as the rights of others, and act by observing them (Yavuzer, 2015).

For a child who grows up with this attitude, what he has to do towards the environment ceases to be an imposition and the child acts as his responsibility. He acts by considering the consequences of his actions. Can develop ideas about the environment other than those given to them and express them in appropriate ways.

1.3. Overprotective Family Attitude

In the overprotective family attitude, the family cares about the child and removes all the obstacles that the child can interfere with. Children grow up in an artificial environment without being aware of the responsibility for their actions. The child, who lives almost without having to think, becomes the most irritable when he feels that his comfort zone is disturbed. The child, who gets used to living without realizing his wishes, has difficulties especially as he begins to take a role in society (Öztabak and Özyürek, 2018; Yıldızbaş and Şahin Sak, 2020).

The most important feature of an overprotective attitude is excessive care and attention towards the child. Children who grow up with this attitude often become overly dependent on the people around them, lack self-confidence, and cannot control their emotional states. These children are dependent on the people around them all their lives and are not capable of self-sufficiency. This attitude affects the child's behavior towards others in social life. A child of primary

school age may want his mother to feed his labor. A child in middle school is still clear and may want to sleep with his father. These requests are considered normal and fulfilled by the family. In this environment, the child may become dependent on his parents. In this attitude, there are no responsibilities that the child must fulfill, instead his parents do everything. (Yavuzer, 2015).

Overprotective attitude is a common attitude in one-child marriages or divorced families. This attitude is also common in families that have lost a child. The upbringing of the parents also affects their attitude towards their children. Parents who have grown up in loveless families want to give their children everything. However, these desires are not caused by their excessive behavior (Eksi, 1990). Children who are exposed to this attitude become very dependent on their mothers and make it a habit to ask them for everything. The children can never make decisions on their own. Even choosing clothes without outside guidance is a problem for these children. They are children who are insecure in social life because they do not take any responsibilities, do not develop manual skills, and often cry when they do not get what they want. These children do not develop normally, even when they become adults, they may develop personalities that demand everything around them, cannot make decisions on their own, and overreact to events (Navaro, 1987).

The child who grows up with this attitude is deprived of some of the mental and physical skills required by environmental activities because the family has done everything necessary for him. For these children, who have a very difficult time living with society and expressing themselves, behaviors such as protecting the environment and taking responsibility may be difficult for the student. In addition to being shy, the child, who is overly dependent on his family, may also have difficulty comprehending the necessity of the activities. Thanks to the activities, the child learns to act jointly with his friends and to express himself. He can gain skills that cannot be learned by his family through activities.

1.4. Apathetic family attitude

In the disinterested family attitude, the family may ignore the child's emotional or physical needs, sometimes both. It is an attitude that is more common in children born as a result of unwanted marriages and pregnancies or in the family structure of special children. The child is fed but does not play with him or ignore certain needs. The ignored child is one of the groups that suffer the most in the long run. In the limited time spent with the family, all areas of

development such as physical and cognitive development are adversely affected by the situation because they cannot be emotionally satisfied, such as belonging and being loved, and not enough games can be played (Taner and Basal, 2013; Şahin and Özyürek, 2008).

In the indifferent parental attitude, the parents leave the child alone and ignore the child's needs, causing him to be excluded from the family. The attitude that emotionally abuses the child is an indication of the lack of communication between family members: the child may exhibit different behaviors to attract the attention of the family and may show behavior of damaging things or friends. It is also seen by studies that children with indifferent parental attitudes are more aggressive (Yavuzer, 2015).

In this attitude, parents do not show interest in their children. Even the basic needs of the child can be ignored. There are no rules and responsibilities in the house for the child. While the mistakes made by the child are constantly brought up, the achievements of the child or the good things he has done are not mentioned. Families do not want to spend power, time, and energy on their children due to reasons such as stress, fatigue, and fatigue in their own lives. Lack of love, which is one of the most basic needs of life, occupies a large place in the lives of these children. They are children who do not know how to love because they are not loved. These children grow up without any positive feelings towards the outside. (Teach, 1999).

One of the most important needs of the child who grows up in a family with this attitude is to belong and be loved. As the child sees the unconditional acceptance of nature thanks to environmental activities, he will be able to find a place where he can belong. Since he is constantly ignored, he will be able to learn how to express himself through the activities to be done.

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CHAPTER V

1. RECYCLING IN PRESCHOOL EDUCATION

The environment is an important area where living and non-living formations are together and connected. Çepel (2006) explains the environment as the whole of the physical, chemical, and biological factors that living things need to survive (akt. Dinler, Simsar, Dogan, 2020).

Environmental education, which aims to increase the environmental values of individuals and to determine the main line for the protection of the environment, leads to the training of people who are aware of their environmental responsibilities and show sensitive behaviors towards the environment (Yaşar, İnal, Kaya, et al., 2012).

It is very important to start education about the environment in the early years. Especially to be sensitive individuals to the environment throughout life, children should be given environmental awareness at a very early age (Yücel and Morgil, 1998).

Recent research and techniques taught in environmental education should be supported by practices from life and a connection with real life should be established. Teachers are people who have important duties in terms of modeling and informing children about environmental education (Erten, 2004; Ilgar, 2007)

1.1. Recycling

Recycling is the inclusion of unused materials in the reproduction chain by passing them through certain stages (Dinler et al., 2020)

Materials such as glass, paper, plastic, etc., which we use in our daily lives, are recyclable materials that can be re-added to production (Dinler et al., 2020).

For the recycling stages not to waste time and not to be tedious, they should be separated from each other without being thrown away. It should then be disposed of in the recycling bins closest to the location. Then, the boxes should be sent to the production sites and evaluated.

It is hoped that the materials consumed by recycling studies will be included in the recycling and therefore the need for raw materials will be reduced. These

practices will reduce the negative effects of increasing consumption on natural life (Armağan, Demir, Demir, and Gök, 2006).

They can be separated concerning different factors such as consumption, production, or according to physical and chemical factors. In this direction, we can call wastes solid, liquid, and gaseous wastes. In addition to these, there are also packaging wastes. Solid ones from waste; It describes solid objects that must be removed sequentially by the people involuntarily for the health of the environment. Regardless of the category, waste; They are now end-of-life products for humans. They are called waste when they lose their value in humans.

When we group the solid wastes according to the places where they exist, it is possible to group them as construction residue wastes produced at home, produced in industry, produced in medical fields, produced in agriculture, and construction residues (Gündüzalp, Güven, 2016).

When examined in terms of types, wastes are not limited to solid ones. In addition to these; There are also wastes consisting of packaging and liquid and gaseous wastes.

Liquid and gaseous wastes;

- Wastes that can be counted as liquid wastes; washing water used in medical fields, wastes of devices used in the treatment of kidney patients, and water consumed at home are liquid (Karasu, 2013).
- Wastes that can be counted as gaseous wastes; smoke from the chimneys of production centers, gas in garbage collection and separation areas, and fossil fuels are used for energy production (Karasu, 2013).

Apart from these wastes, there are also residues of packaging. Packaging wastes; Apart from the residues formed at the end of the production network, it is explained as transportation packaging waste, which is used in the presentation of the product to the buyer during the transportation of the products or different materials to the consumers or to the person who will use them as a result, and is thrown into the environment, including reusable packaging when its life expires (Sayar, 2012).

Packaging wastes are grouped according to the materials they are made of. Some of these are as follows; paper, wood, glass, and composite packaging.

1.2. Paper Waste

Paper is the most consumed type of packaging throughout human life (Sayar, 2012).

Due to the material of the papers, it breaks down into fibers in water. If there is a different substance on the paper, it should be cleaned and recycled. If the fibers of the papers are ready for recycling, they are converted and included in production as a new paper. Paper/cardboard wastes can be recycled in facilities as paper products (PAGÇEV, 2016).

Paper and cardboard products give negative results for recycling because they get wet easily. Therefore, it should be stored in dry environments as much as possible. Therefore, we need to make people aware of it. In this way, the recycling of cardboard products can be increased.

1.3. Plastic Waste

Plastic products consisting of petroleum remain in the environment for many years without being affected and worn out in any way. The densities of these substances are also very low. For this reason, they are considered one of the most important causes of environmental pollution (Karagözoğlu, Özyonar, Yılmaz and Atmaca, 2009).

In addition to the fact that these products do not disappear in nature for years, it is known that they also negatively affect the nutrients put into them. For this reason, it is recommended that they should not be preferred in foods and that reusable products should be preferred instead of single-use plastics.

In terms of recycling, they should be largely separated from the substances they contain. Chemical-containing products mustn't be kept together with other plastic products.

1.4. Glass Wastes

Glass products are suitable for repeated use due to their structure. For this reason, people should be encouraged to use it in many areas, especially in foods. Rather than producing a glass product from the beginning, producing recycled glass products causes less energy use. According to the first colors they were produced, they are produced as the same color in recycling. A ton of glass that is recycled will save us liters of oil (Karagözoğlu et al., 2009).

1.5. Metal Wastes

Minerals are used in the production of metals. Minerals are purified to produce metal products. Mostly, aluminum is preferred in food products around us because of its lightness and easy shapeability. Aluminum used in homes is the most valuable recyclable product. As with the recycling of every other product, there is a great energy saving in the recycling of aluminum products. Recycling of metals is also an economically important item (Karagözoğlu et al., 2009).

2. Renewable Energy

Our country is considered rich in many renewable energy sources. Geothermal energy, which most countries do not have, is 8% of the energy available in the whole world. In addition, due to its location in the world, it mostly sees the sun, which increases the potential for energy production from the sun. When we look at the hydroelectric potential, it has an important place in the world. Recently, with the increasing need for energy, the capacity to produce electrical energy from wind has also increased considerably. Their cost is also quite low, unlike the production capacity. In addition, in their production, the living things in the environment and the environment are not harmed (Gençoğlu, 2002).

3. Ecology

For the most part, all living things in the universe are related to other living things and the ecosystem. The branch of science in which this relationship is studied is ecology. First of all, humans and then all plants and animals are in the category of living beings. All living things need an ecosystem to survive. Finding and maintaining suitable environmental conditions are among the main goals of natural science.

There is a need to have water, air, light, and soil within the appropriate neighborhood conditions. These needs are essential for all living beings. The concept of ecosystem includes all living and non-living beings. Natural science is not interested in the organs of living beings. The goal of natural science is to provide a living space for living things by hosting the necessary environmental conditions for living things. It deals with the environmental conditions and substances needed by living beings. This branch of science examines almost all environmental conditions. It is possible for living things to continue their lives under certain conditions. In these situations, all living things interact with other living thing. This interaction varies in every living thing. This interaction is very important for living life.

It would be correct to state that the environmental conditions have deteriorated very quickly in recent days and will cause very important problems in the coming days in the world. Environmental problems such as the depletion of natural resources, environmental pollution, global warming, and the melting of glaciers seem to pose a lot of threats to the world. The destruction of the natural environment brings with it different natural events. Floods, storms, hurricanes, floods, etc. have started to increase all over the world. Natural science also

examines these events in detail and diagnoses what precautions should be taken. Considering that all living beings live in the middle of the ocean floor with an atmosphere, it is obvious that the ecological system must be carefully preserved.

4. Preschool education and recycling

Creating environmental awareness in children is related to recycling. Therefore, recycling should not be ignored in preschool education. It is essential to bring this awareness to children at an early age. For this, the education of children should be started in the preschool period, which is one of the most important tools (Öztaş and Bartan, 2019).

Starting from preschool age, children should be aware of recycling. In addition, these ages are very important for the definitive prevention of environmental pollution, which exists today and is predicted to be a major problem in the future. Looking at the literature, there are very few studies on recycling in preschool children (Öztaş and Bartan, 2019).

Kabadayi (2012) conducted a study to reveal the environmental education processes of preschool and preschool teachers within the framework of pre-education, education, and post-education practices and to determine the extent to which classroom practices will work for the environment, recycling, and disposal of waste batteries. 6 pre-service teachers and 60 preschool students participated in the study. Preschool children were trained on eco-system, ecology, recycling, and clean environment for 4 weeks. As a result of the research, children collected a total of 320 waste batteries and became aware of recycling. Teacher candidates, on the other hand, announced that they were more conscious environmentalists as a result of the research.

This research also shows that environmental education given in the preschool period is not inconclusive. Although there is no education under the name of environmental education in our preschool education programs yet, it is tried to be given through science and nature activities. Some researchers believe that this is not enough. Taking these views into account, environmental education should be included in preschool education programs.

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CHAPTER VI

MODELS OF ENVIRONMENTAL EDUCATION

1. What is the environment?

The environment is every area where all living and inanimate objects continue their lives and meet their social, cultural, biological, and economic needs (Yıldız et al. 2000). For centuries, humanity has seen nature as a resource whose borders do not exist and has consumed it in vain. Thus, environmental problems have arisen (Tıraş, 2014). Especially in the 20th century, as a result of the development of industry and industry, the concept of environment has started to be used much more frequently with the increase in air, water, and soil pollution, differentiation of climatic characteristics, extinction of animal and plant species, environmental problems and ultimately threatening the life of living things (Bülbul, 2013: 7). In our age, environmental problems have reached dimensions that threaten all living life and nature. Long ago

And if effective measures are not taken, more serious vital problems await the world and concerns in this direction are increasing. The areas of discussion about the impact of environmental problems on our lives and how they can be corrected are expanding in parallel with these concerns

(Yogurtçu, 2021) . Environmental and human relations are a process that started with the emergence of human beings as a species and extends to today when we have come to the stage of threatening nature completely by dominating it (Ertan, 2004).

Human beings, who live in nature and as a part of nature, have experienced their relations with the environment differently in different periods and expressed their view of the environment differently (Ertan, 2004). Carelessly consumed environment; It has shown that it can disappear and is very important to people with disasters, pollution, problems, and deterioration, as well as extinctions at the micro and macro level. With the increase in population, people have started to act together in the face of the scarcity of natural resources, which they understand to be limited. Unity and solidarity in the protection and development

of the environment have brought the idea of brotherhood and solidarity all over the world. (Ertaş, 1997: 37).

The environment has been adversely affected by all economic, social, cultural, and artistic activities of people. Throughout history, this situation has developed against the environment and the pressure on the environment has intensified with industrialization. Especially with the impact of major environmental problems and the work of people with advanced environmental sensitivities, environmentalist ideas, and movements have started to be in demand and accepted. The research and works of intellectuals and thinkers have shown that the environment should be protected while revealing the dimensions of the environmental problems (Kayaer, 2013).

In the process to date, human needs are constantly changing and nature reacts to the effect of these changing needs. As this action-reaction of people and problems changes, it is necessary to make a change in the solution. This can be possible by recognizing the environment in which people are located, actively participating in the solution of existing and potential problems in this environment, seeing the changes in their environment, and gaining new behaviors towards the environment (Başaran, 1977; Yılmaz, 2016).

2. Environmental ethics

Ethics is the activity of valuing something (Özdemir, 2016). Thinkers, with the awareness that the environment is inalienable for human life, said that human beings are the biggest factor that consumes and harms nature, and as a solution, they put forward the concept of “environmental ethics”, which is an applied field of ethics (Ağbuğa, 2016). For many years, the field of ethical interest has been limited to man and society. Recently, the newly emerging understanding has tried to direct its ethical interest to living beings other than human beings, and beyond that, to the elements of nature and nature itself (Ertan, 2004).

The nature of environmental problems has pushed people to find some solutions in the face of these problems. It is not only a question of protecting the environment with strict rules, discipline, and force. (Keleş and Hamacı 1993).

Environmental ethics addresses the problems of morality between humans and the natural environment and how people’s behavior differs (Jardins, 2006).

The ethical principles that govern man’s view and behavior towards nature and other living things determine the duties and responsibilities of human beings towards the world, the natural environment, and all other living things (Taylor, 1989).

Environmental ethics addresses the moral issues between humans and the natural world and how human behavior is diversified in this way (Jardins, 2006).

3. Ethical Approaches to the Environment

Ethical approaches to the environment have been examined by various researchers and scientists from different perspectives and under different headings (Gagnon Thompson and Barton, 1994; Şahin, 2004: 198; Kayaer, 2013; Yalmançı, 2015). In short, all these can be generalized under the title of human-environment relations and can be considered in two dimensions human-centered (anthropocentric) and non-human-centered or nature-centered (non-anthropocentric) approaches (Karakaya & Çobanoğlu, 2012)

In our study, Anthropocentric, Ecocentric, and Antipathic approaches were taken into consideration.

4. Anthropocentric (Anthropocentric-Egocentric) Approach

Human beings are considered to be the most important actors in the solution of these problems as well as being responsible for the formation of environmental problems. Therefore, it is thought that the ethical rules that shape the behavior of people towards the environment and determine the relationship between the environment and humans should be considered and evaluated in this context and that the phenomenon of environmental ethics is of great importance in creating an ecological consciousness. Human activities damage the environmental balance and It is claimed that the reason why it causes problems is anthropocentrism, that is, anthropocentrism, which is the dominant view of environmental ethics adopted by the majority (Özsoy & Çini, 2020). According to the anthropocentric approach, which comes from the Greek word “anthropos”, everything such as plants, animals, and inanimate objects exists for human beings and has no value.

Believing that the environment should be protected because it is beneficial, good, and right for human beings The basic logic of the anthropocentric ethical approach is that the environment exists for the benefit of human beings and People and the environment for their potential to benefit in the future and for future generations and days It is the need to establish a balance. Anthropocentric ethics, which began to understand the importance of human and environmental relations with the endangerment of human life opportunities, has its roots in human and nature It is one of the oldest ethical approaches that go back to the days when the struggle began (Ertan, 2004)

This approach is based on the idea of human beings being the owners and master of nature (Ağbuğa, 2016). This approach is an approach that puts human beings at the center of life (Firat, 2003), gives people the right to consume unlimited (Real, 2016), and does not consider the relationship between humans and nature important. (Saka and Sürmeli, 2013).

The anthropocentric view is based on the view of ecological assets as a factor of production and the environment as a resource store; It causes environmental problems to be perceived economically within the framework of cost-benefit analysis, to seek solutions within the operating rules of the economy, and to offer mostly technical suggestions for solutions. Economists who adopt this approach and are concerned with the environment and environmental problems calculate the cost of environmental pollution and problems through economic techniques (Özsoy & Çini, 2020).

Aristotle is one of the greatest proponents of anthropocentrism, he drew a pyramid of living things and placed humans at the top of this pyramid and argued that there are plants for animals and animals for humans (Keleş and Ertan, 2002).

The thinker Kant also said that the goal is human beings. In other words, it is man who is superior, man has no responsibility for animals and plants. Animals and plants are just tools. If they will benefit people, they deserve to be protected (Karakoç, 2004: 63).

According to this approach, the stewardship and management of nature is in humans (nature is for human use and entertainment), and this approach is based on personal interests (Karakaya & Çobanoğlu, 2012). For example, a bacterium may be seen as more important than a tiger or penguin for human survival. That is to say, everything that is good for man is also good for nature (Wilkinson, 2002: 223).

Turgut (2009: 29) evaluated the rigid/strict version of the anthropocentric approach in a separate category as the egocentric approach.

In the strict anthropocentric approach, he states that the human ego is of unlimited value and that everything aims to increase human happiness at all costs.

Based on this understanding, western civilization, which consumes nature unlimitedly and irresponsibly, has adopted more understanding approaches to nature in the face of emerging environmental problems. Thus, it can be said that this approach is no longer valid today, at least at the theoretical level. Wilkinson (2002:223)

5. Ecocentric Approach

The ecocentric approach is an ethical approach that sees human beings as part of the global ecosystem and adheres to ecological laws. In the anthropocentric approach, *the 'human'* and the biocentric

In the approach, *the value of which 'all living beings'* is the subject, in the ecocentric approach, *the value of 'whole environment' or 'nature' in the sense of the whole of living and non-living beings.*

Ecocentrism is the latest and most advanced stage of 'ethical expansionism', *which expands from the relations between people to the relations between humans and society, and then extends to the relations between humans and other living beings with the biocentric approach, towards the relations between human and nature, and thus puts human-nature or human-environment relations into the ethical framework* (Ertan, 2004).

It is based on the understanding that ecosystems and/or the biosphere have ethical significance. It is argued that human beings are the sentinels of nature (Karakaya & Çobanoğlu, 2012).

How realistic is the environment-centered ethical approach that environmental problems show to human beings?

proves that it is. The pollution, deterioration, or destruction of air, seas, lakes, rivers, soil, mountains, and forests, in short, all environmental elements, reveals that the environment should be treated more ethically (Kayaer, 2013)

In this approach, it is emphasized that the mutual relations between the components of the ecosystem should take place following the natural functioning of the ecosystem. The source of environmental problems, and indeed most of the problems that people face today, is the rapid and uncontrolled increase in the human population, as well as the established and dominant habits in production, consumption, and the functioning of private property. Of course, the reason for all this is that only human beings are at the center of the ethical system that directs actions and thoughts, that is, anthropocentrism (Karakaya & Çobanoğlu, 2012).

According to Epictetus (2011), man should aim to live in harmony with nature.

Curi (2009) emphasized that man should stop believing that he is the master of the universe, give up a human-centered perspective, and respect the right of everything that exists in the environment to survive.

Reeves and Lenoir (2006) mentioned that people should abandon the habit of using natural resources only for their own interests and plant trees,

hold rainwater, and revitalize wetlands to prevent the spread of desert and arid lands.

Today, this situation has changed, and the awareness that human beings have responsibilities and ethical duties towards all other people has been established. According to the arguments of ecocentrism, the same ethical change can take place in a way that covers natural assets and the ecosystem as a whole (Karakaya & Çobanoğlu, 2012).

All approaches are valid despite their shortcomings.

Although the anthropocentric ethical approach has lost its theoretical validity, it is the most widely used ethical approach in environmental policies and law, that is, in practical life.

The biocentric ethical approach and the ecocentric ethical approach should be considered complementary, not substituting one for the other.

Accordingly, neither environmental hostility nor human hostility should be made, and new ethical approaches should be developed (Keleş and Ertan, 2002).

6. Eco-school model for a sustainable society

The Eco-Schools Project is an international project. So much so that it is implemented in 30 countries and a total of 7500 primary schools, and within the scope of this program, children are given environmental awareness and management and sustainable development education. (TÜRÇEV, 1995)

Among the countries implementing this project are Germany, Belgium, Bulgaria, Denmark, Estonia, Finland, France, South Africa, Southern Cyprus, Croatia, Netherlands, England, Ireland, Scotland, Spain, Sweden, Italy, Iceland, Kenya, Latvia, Lithuania, Malta, Norway, Portugal, Romania, Russia, Slovenia, Spain, Sweden, Greece and Turkey.

The Eco-Schools Project, programmed on a European scale, includes comprehensive environmental education practices. In the curriculum applied in schools, the transfer of environmental issues to daily life is ensured by this project.

This enables students to comprehend the importance of the environment and environmental issues and to be sensitive to environmental issues in all areas of life. In our country, the schools implementing the Eco-Schools Project include the program within the scope of the Eco-Schools Project within the framework of the primary education program determined by the Ministry of National Education (TÜRÇEV, 1995).

Environmental and sustainable environmental issues, which are very important today, are effective in all areas of human life.

Protection of the environment is only possible with the young generation and society that are aware of this issue. In this context, the Eco-Schools Project is of particular importance.

While the students of the schools implementing this project are informed about environmental issues, they also take an active role in raising awareness of their families, local governments, and non-governmental organizations about the environment and environmental problems.

Within the scope of this project, the “Green Flag Award” is given to schools that are actively working and have achieved outstanding success with their environmental education program. The award is for environmentally conscious schools that are internationally recognized and respected as an eco-label.

The active participation of students is the most important and integrative factor within the scope of the Eco-Schools Program. The program also improves students’ communication skills and enables them to become good citizens because, in this process, the committee is in contact with local people and administrators within the scope of environmental issues (TÜRÇEV, 1995).

Some of these schools are public schools, while others are private schools. If we look at the distribution by provinces, there are eco-schools in 42 provinces, while there are still no eco-schools in 39 provinces (Eco-schools, 2013).

The eco-school program is a long-term program. In eco-schools in Turkey, the award is renewed every two years. The awarded school receives an eco-labeled green flag. In addition, there is a document and logo that can be used among the official documents of the school (Eco-schools, 2013).

Schools included in the Eco-Schools Program shape their curricula according to the following elements that are the basis of the program. These items are as follows:

- **1. Establishment of the Eco-Schools Committee:** The committee, which is described as the brain of the Eco-Schools Project, includes volunteer students, teachers working in the school, administrative officials, parents, and even local administrators and coordinates the school’s activities on the environment and environmental issues.

- **2. Environmental Review:** The work in the school begins by examining the effects of the school on the environment. Students examine everything

from the amount of garbage disposed of in the school to the inadequacies of infrastructure (sewage, etc.).

- **3. Action Plan:** The information and results obtained as a result of the environmental investigations go through the evaluation process and clear dates are targeted to increase environmental performance, where feasible, realistic goals will be determined.

- **4. Observation and Evaluation:** The continuity of environmental education in the school is possible with observation and evaluation. The action plan created and the regular follow-up of this plan ensures the success of the subjects studied in the school.

- **5. Curriculum Work: Classroom** studies are carried out on subjects such as waste, energy, and water, in which the whole school is involved. With the participation of the whole school, water and energy are saved, waste is collected and separated, and recycling activities are carried out. In this context, it is aimed to make environmental education a part of national school curricula.

- **6. Information and Participation:** As parents, local authorities, industries, and the wider community become involved in the Eco-Schools Programme, the size of the project grows, and schools and students engage with other organizations to gain knowledge and experience. Schools call on their environment to be sensitive to environmental issues with their work.

- **7. Eco-Principle:** It is an expression of the objectives that show the responsibility of the school in its environmental studies. The implementation of the project provides students with habits that they will use throughout their lives and affect their success as well as the environment (TÜRÇEV, 1995).

7. Benefits of the Eco-Schools Program

The benefits of the eco-schools program for students/children are as follows (Eco-schools, 2013):

- They develop a new identity and belong to a group.
- They create a collaborative structure by being involved in group work.
- They develop problem-solving skills.
- Initiative and decision-making skills develop.
- They develop the skills of setting up plans and writing reports.
- Their understanding of consumption changes and they are careful not to waste.
- They know that they need to conserve natural resources.

The benefits of the eco-school program to schools are as follows (Kadji-Beltran, 2002):

- It maintains cleanliness and order.
- Water and electricity savings are achieved with the participation of students.
- Students love and embrace the school.
- Obtains national and local promotional opportunities.
- It wins an internationally recognized prestigious award.

It has been concluded that the eco-school program not only benefits students in terms of developmental areas but also contributes to school staff in many areas as well as students. In many studies reviewed (Aktepe and Girgin, 2009; Krnel and Naglic, 2009; Batak, 2011; Bozdemir, 2011; Hallfreðsdóttir, 2011; Boeve-de Pauw and Van Petegem, 2013; Er, 2015), it has been concluded that with this program, children have become more conscious and self-sacrificing towards the environment.

The determination of the subjects and side issues related to the eco-school is created by taking into account the interest needs of individuals and the environment. Teachers love the activities carried out as part of the eco-school program; It has been revealed that it is loved for different reasons, especially for raising awareness about protecting nature.

Many weak points were encountered in the implementation of the eco-school program; It has been concluded that eco-school program practices should be disseminated according to needs and sharing among teachers should be increased. Although the eco-school program makes many contributions to all stakeholders in educational institutions and their environment, campaigns explaining the benefits of the eco-school program can be organized with the support of the higher authorities since there is no support from outside the institution and the gains cannot be achieved due to the reluctance of the parents (Altin, F & Gold, M., 2020)

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CHAPTER VII

1. SOIL POLLUTION AND PRESCHOOL EDUCATION

The smooth functioning of the environment and its resources, which are necessary for today and future generations, depends on the activities of human beings who benefit from the environment. Because among all living things, human beings are the creatures that have the largest share in the negative change and shaping of the environment (Menteşe, 2017).

The most important impact of human beings on the environment and its resources is on sustainable use. Sustainability is the concept that emerged as a result of the perception of environmental destruction as a problem and aims to solve these problems. The main condition of sustainability is the idea that humans and nature are complementary to each other, not opposite to each other (Menteşe, 2017).

As it is known, soil science; is a branch of science that examines the structure, formation, distribution, physical, chemical, biological, and mineralogical properties of soils. For this reason, soil science has sub-disciplines such as soil chemistry, soil physics, soil mineralogy, soil biology, and soil survey mapping (Ağca, 2012)

In particular, sensitive ecosystems such as soil, water, and air, which are physical elements of the natural environment, are polluted by human beings without realizing it. As a result of this situation, soil, water, and air, whose natural cycle is disrupted, cannot fulfill their functions. Environmental pollution occurs in the environment where human beings live, and as a result, it affects all living and non-living environments (Menteşe, 2017).

1.1. What is soil pollution?

Soil is fertile to the extent that it provides water and nutrients to the biological environment (plants, animals, microorganisms, and humans) living in and on it. Therefore, soil constitutes an important ecosystem for the biological environment. For this reason, the pollution of the soil ecosystem is vital for the biological environment (Algan & Bilen, 2005).

It is a substance consisting of soil, rocks, and some decomposition products of organic substances, which contain air, water, and many living things (Ergene, 1993).

When the industry was not yet developed, scientific knowledge was not so much, intensive agriculture was not carried out, and the population was sparse, there was no pollution in the soil such as water, air, etc. However, with the industrial revolution, industrial activities, urbanization, and population increase, soil pollution has taken its place in our lives as an important environmental problem. At first, soil pollution was not seen as important as water and air pollution, but recently developed countries have started to care about soil pollution (Su et al., 2014).

- Soil pollution, in a general definition, is the deterioration of the physical, chemical, biological, and geological structure of the soil as a result of human activities. Soil pollution occurs as a result of the application of wrong agricultural techniques, the use of wrong and excess fertilizers and pesticides, wastes and residues, and the accumulation of toxic and dangerous substances in the soil. Pesticides, which contain many chemicals, have an important role in water and soil pollution. As these move to more advanced organisms in the food chain, they become increasingly concentrated at each stage, causing significant damage to the carnivores that increasingly form the last link in the chain. That is, harmful chemicals are present in very small amounts in simple organisms, which concentrate as they are eaten by more complex organisms; When it reaches carnivores that eat herbivores, it has reached harmful dimensions. In particular, the negative effects of pesticides have been observed in birds of prey such as hawks, hawks, and eagles and birds feeding on fish such as pelicans and cormorants. Many insect species are immune to these substances; In addition, through heredity, the resistance of subsequent generations to poisonous drugs increases. On the other hand, the continuous use of these chemicals has led to the emergence of previously absent pest communities in some regions. The main reason for this is that pesticides destroy carnivorous insects that keep the herbivorous insect population under control (Karaca & Turgay, 2012)

- Heavy metal pollution, which is seen as one of the soil pollution factors, and related regulations form the basis of this study. In particular, if some of the lands contaminated with heavy metals are exposed to irreversible pollution, the lands can be completely out of agriculture. As a result of the analysis of the soil samples taken from these lands, pollution is defined if it remains within the limit values determined in the regulations or is above these limit values (Koca, 2019).

Along with the developing agricultural practices, various chemicals, wastes, and residues applied to soil and plants pollute soil and water resources and make them uninhabitable for the living things living on them. Some of these substances, which mix with rainfall and irrigation water and the lower layers of the soils and from there to the groundwater, deteriorate the quality of the water and make it undrinkable. In our country, which has great potential in terms of agricultural areas, agriculture is the main source of our economy. The fact that the country's population increases by 2.5% per year and the agricultural areas are based on the limit necessitates us to buy more quality products from the unit area. According to the research, the effect of fertilizer has a share of 58%, the effect of irrigation has a share of 20-25%, and the effect of seeds and pesticides has a share of 17-22% in the amount of product to be obtained. Pollution of agricultural origin can be grouped under four main groups:

1. Fertilizers
2. Agricultural pesticides (Biocides, Pesticides)
3. Watering
4. Other agricultural practices (Yildiz, 2008).

1.2. fertilizers are used in agricultural production to maintain high yields. There are main types of fertilizers of the breed: natural (organic) and artificial (inorganic) fertilizers. Natural fertilizers are made up of materials from different types of organisms, such as plant and animal residues. For this reason, it functions as a nutrient not only for the plant produced but also for all soil organisms and increases the population density and biomass of the organisms.

Artificial fertilizers, on the other hand, are created in a laboratory environment. There are three basic nutrients in fertilizers; nitrogen, phosphorus, and potassium.⁷ Basically, they are based on meeting the needs of the plant such as nitrogen, phosphate, and potassium, and increasing the yield, and they are developed based on this. For this reason, they do not serve as food for organisms in the soil other than plants.

When fertilizer is used more than necessary and for a long time; Problems such as acidification, salinization, accumulation of heavy metals, nutrient imbalance, yield losses, nitrate accumulation in water, and release of nitrogen and sulfur-containing gases into the air begin to occur in soils.

1.3. The break related to the high rate of soil pollution caused by pesticides (the general name of chemicals that kill target organisms or groups of organisms used in agriculture) was essentially the 20th century. It happened in the first quarter of the century with the discovery of synthetic pesticides produced in the laboratory. Unlike many pesticides used until then, synthetic pesticides had a much wider range of effects, were easy to apply, and, most importantly, were cheap.

In pesticide applications, 0.015-6.0% of the drug discarded reaches the targeted organism and the desired effect is obtained, the remaining 94-99.9% reaches non-target organisms and soil or is carried to the surrounding natural ecosystems as a pollutant by wind and currents.

1.4. Domestic and industrial wastes (including agricultural production processes) cause soil pollution with pollutants thrown directly into the soil, as well as indirectly through pollutants released into the air and water during individual use and industrial production processes.

These wastes contain high amounts of heavy metals, inorganic chemicals, minerals such as arsenic and asbestos, pollutants such as petroleum products, and radioactive elements such as uranium and radium. The soil in contact with the pollutants is polluted by direct irrigation of the soil area with these waters or by the indirect leakage of polluted water into the soil areas.

The fertility and capacity of the soil, which is polluted as a result of various human activities, also changes. As it is known, when the soil is polluted as a result of various activities, it creates a dangerous environment that is the most difficult to clean and sometimes not possible at all. In addition, the pollution in the soil cannot be easily noticed by human beings.

The most important effect of soil pollution on human beings is that it causes various diseases. Because the pollutants that pass into the body of the plants grown on the contaminated soil pass from there to the bodies of the human beings who feed on these plants and cause negative effects on the health of living things.

The transfer of pollutants accumulated in the soil to the plant body constitutes the most important effect of soil pollution in terms of environmental health. As a result, pollutants reach the human body as a result of the consumption of these plants directly or animals feeding on these plants.

Soil pollution is also important in terms of water pollution, as it also harms aquatic environments. Because pollutants in the soil enter groundwater with

leakage and surface waters with surface runoff and erosion, causing significant and serious problems. Therefore, it is necessary to protect soil resources and sustainable soil management.

2. Environmental pollution and preschool education

Environmental education is explained as the education carried out to understand and recognize the environment in which people live until death, and to have an idea about the future and protection of this environment (Dikmen, 1993).

Environmental education, which should continue throughout life, should be given from early childhood when human personality traits begin to take shape. Therefore, “preschool education” is the place where the foundation of the attitudes and behaviors that an adult should have is laid. The attitudes and behaviors that the child learns in early childhood constitute the main personality structure of individuals in the future. Researchers state that environmental knowledge and attitudes towards the environment begin to take shape in the preschool period and that the environmental awareness gained in the preschool period has an important place in developing a positive attitude towards the environment in the following years (Smith, 2001; Taskin and Sahin, 2008).

It is possible to summarize the importance of environmental education in preschool education programs as follows (Başal, 2005; Büyüktaşkapu, Koçyiğit, Öztürk-Samur and Özenoğlu-Kiremit, 2011):

Environmental education is important for the individual himself: Nature can both inspire people and enable them to live in peace, as well as nurture the personality and mind of the individual.. Our world is deteriorating through human influences and needs young generations to find solutions to emerging ecological problems: To raise generations that are respectful, sensitive, and environmentally conscious towards their environment; It is necessary to teach children the importance and methods of protecting the existence of the ecological system in the best way and how to live in harmony with the system.

Since nature itself is a model, it forms the core of educational programs: events such as birth, growth, and death are basic biological issues that are interesting and curious to children. In addition, observation, classification, and communication skills that increase the child’s success at school can develop during his interest in nature.

Environmental education in the preschool period also supports the developmental areas of children. Time spent in nature and games played

outdoors can support the development of children's physical and motor skills and contribute to their cognitive and language development by providing many learning opportunities. Green spaces can create opportunities for children to play more creatively.

In addition, the opportunity for children to share simple nature experiences with an adult who cares for them or all of the activities they will perform with their peers in nature can positively affect the social and emotional development of the child (Yayla, Ceylan and Ülker, 2014).

It is seen that the importance of environmental education is emphasized within the scope of many preschool education programs implemented today.

Montessori stated that for the child to discover himself and move freely, he should notice the order, harmony, and beauty in nature and be happy about it (Temel and Toran, 2012; Akt; Yayla Ceylan and Ülker, 2014: 37-58). According to Montessori, schools with gardens, fields, and animals should be established so that children can observe the development of living beings and learn to show interest, care, and care for plants and animals during these observations. By taking care of plants and animals, the child can feel love, sympathy, and trust towards these creatures. Observing the gradual germination of a seed planted in the ground, he will be able to get used to being patient and waiting. When the child learns that the survival of the plant he has planted depends on its watering and that an animal is waiting for the food that it will give, he will be able to begin to understand that he has a duty in life.

The Regio Emilia Approach is one of the preschool education programs that attaches importance to environmental education. In the schools where this program is implemented, the presence of live flowers and plants, the important place of outdoor games in the program, and the presence of climbing hills and trees of a wide variety of species and heights are considered important in terms of enabling children to interact with nature.

The Waldorf Approach, reveals the importance they attach to the environment with the idea that natural materials should be present in the classroom and that these materials help to establish the connection between nature and the world (Yayla Ceylan and Ülker, 2014).

In the 2013 MEB Preschool Education Program implemented in our country, there are achievements and indicators for the child to recognize and protect his environment. As well as the achievements and indicators, the environments and strategies that should be created to provide children with these achievements and indicators are also important.

Environmental education in preschool can be carried out in a wide variety of settings. Kindergartens, zoos, gardens of schools and houses, picnic areas, and any place where nature and children can interact can be given as examples of these environments. What is necessary is to provide children with opportunities that will enable them to have a direct relationship with nature.

Wilson (1996) emphasized that some situations should be considered in environmental education practices in early childhood. These:

3. With simple apps where children can feel safe
4. should be started.
5. The active participation of children should be ensured.
6. They should be given enjoyable and memorable experiences.

Environment

7. It should not be forgotten that the pleasure to be obtained from its education is as important as its content.

8. Not only education but also experiences should be prioritized.

9. All the emotions of the children should be involved.

10. More than one method and technique should be used at the same time in education.

11. Teach children that all components of the natural world interact together and

12. Studies should be carried out to help them understand what they are in.

13. Model to build children's interest in the natural world

14. should be.

15. A warm and friendly environment should be created for children.

16. Different cultures and perspectives should be introduced.

17. They should be made to focus on the perfection and beauty of nature.

18. Spend as much time outdoors as possible: If children want to be aroused with a love and curiosity about the environment they live in, an opportunity should be created to interact with them at every opportunity.

19. Environmental education should be included in every aspect of the preschool program.

20. It should be considered that the most suitable learning environment for children is play, and

21. Play should be used as a learning tool.

22. The child's interaction with his natural environment affects his physical, mental, and emotional

23. It should make it easier to participate.
24. Understanding concepts rather than learning by rote and patterns,
25. Analysis-based learning should be carried out.
26. Children's exposure to different elements of nature such as plants, animals, water, soil
27. Daily activities should be done to ensure their interaction.
28. Formation of social interaction, cooperation, and cooperation among children
29. Ensured.
30. In environmental education activities, families as well as children should be included in the process.
31. Nowadays, children, especially in big cities, do not have many opportunities to interact with nature. Children who are not aware of the power and beauty of nature are gradually moving away from nature and can grow up by keeping themselves separate from natural life rather than as a part of natural life.
32. Environmental education offers children the opportunity to move and be in touch with nature, while it can enable them to get to know the environment and develop positive environmental attitudes. It should not be forgotten that most of the attitudes and behaviors acquired in preschool education can continue into adulthood. If future generations are to be more sensitive to the environment, a qualified environmental education should be provided in pre-school education.

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CHAPTER VIII

1. WATER POLLUTION AND PRESCHOOL EDUCATION

1.1. What is the environment?

The concept of environment, which is of vital importance for living things, has different definitions.

The Turkish language association explains the concept of environment with two definitions.

1. Near something, therefore, around, the periphery.
2. It is the environment that makes up the society in which the person lives.

Albert Einstein, one of the scientists, stated that the environment is a concept with a broad meaning with his definition of the environment as “everything that happens outside of me”. (Çoşanay, 2018)

1.2. Environmental pollution

Environmental pollution; It is the whole of the environmental problems that negatively affect the lives of living things, which occur with the formation of damaging effects in the basic physical factors of nature such as air, water, and soil.

It has been revealed that the environmental problems encountered in industrial zones are not only a physical and mental threat to human beings but also threaten civilization and cultural facts and heritage. Towards the end of the twentieth century, environmental pollution reached its highest level and began to affect industrial zones, oceans, entire continents, and even the mechanisms of international order. (Karaca, 2018)

Moreover, these problems affect not only developed countries and backward or developing countries at the same level. Some of the factors that accelerate environmental pollution are;

- Growing World Population
- Uncontrolled Consumption of Natural Resources

- Unplanned Industrialization
- Urbanization
- Nuclear Studies
- Regional Wars
- Pesticides
- Chemical Fertilizers
- Detergent
- We can count them as chemical substances. (Altinsoy, 2018)

1.3. What are the Types of Environmental Pollution?

We can examine environmental pollution under 5 different headings.

- Air Pollution
- Water Pollution
- Soil Contamination
- Noise Pollution
- Light Pollution

1.4. Su and water pollution

Water is a colorless and odorless liquid consisting of 2 hydrogen and 1 oxygen. It is very difficult to withstand thirst. Although a person can survive for 40 days with only water without taking food, he can only withstand thirst for 10 days.

- ❖ 95% of the fetus
- ❖ 62-67% of human organisms
- ❖ 60-70% of animal organisms consist of water.

Water is very important for our body and our world. Physiological events cannot be sustained in an environment without water. Some of the life-threatening diseases occur when the cells are dehydrated. All vital activities are dependent on water. It is necessary to provide the water necessary for these vital activities in a way that does not contain harmful chemicals and disease-causing organisms. The water used must be also removed in a way that does not harm people.

1.5. What is water pollution?

- It is the deterioration of the existing physical, chemical, and biological properties of water quality to the extent that it can prevent any use. (Erol, 2016)
- Water pollution is the mixing of substances that will harm water such as biological, radioactive, organic, and inorganic into the water to the extent that it will deteriorate the quality of the water. (Çoşanay, 2018)

2. CAUSES OF WATER POLLUTION

2.1. Organic Water Pollutants

- Detergents
- Chemically treated drinking water
- Food processing waste
- Pesticides and herbicides
- Oil Hydrocarbons, petrol, Diesel fuel, Jet fuel, fuel oil and engine oil
- Debris of trees and shrubs scattered from forest workshops
- Volatile gases (VOCs) such as industrial solvents resulting from improper storage
- Hygiene and cosmetics waste

2.2. Inorganic Water Pollutants

- Acidic factory waste, such as sulfur dioxide
- Ammonia, which is among the food processing wastes
- Chemical factory waste
- Nitrogenous and phosphorus compounds in fertilizers
- Heavy metals
- Various man-made alluviums

2.3. Coarse-Scale Pollutants

It is a type of physical pollution that occurs when visible substances are mixed with water. Especially as a result of floods or storms, large substances can pass into watersheds.

These pollutants are

- Trash such as paper, plastic, or food scraps
- Various plastics transported by ships
- Shipwrecks

3. TYPES OF WATER POLLUTION

- Pollution of surface waters
- Groundwater Pollution
- Microbial Pollution
- Chemical Pollution

3.1. *Pollution of Surface Water*

- It is visible pollution.
- We can see it in our rivers, lakes and oceans.
- Water bottles, plastics, and other waste products that we often encounter as a result of human consumption are examples of this.
- Another pollution is the pollution that consists of oil and gasoline wastes that float on the surface of the water, affecting the water and its habitats.

3.2. *Groundwater Pollution*

- Chemical pollutants mostly reach groundwater and cause certain pollution there.
- Generally, pollutants with high toxic substance content are caused by pollutants such as pesticides leaking under the soil and mixing with groundwater.

3.3. *Microbial Pollution*

- It is a pollution caused by microorganisms in untreated water.
- Cholera is harmful bacteria or viruses that can cause serious diseases such as typhoid.

3.4. *Chemical Pollution*

- Due to mass production in industrial farms and power plants, there is a lot of chemical flow into water sources and streams.
- Metals and solvents are introduced into the water from factories, polluting the water.
- The main causes of groundwater pollution are;
- Giving domestic wastes and industrial wastes to nature without treatment,
- Excessive and unconscious use of pesticides in agriculture,
- It can be said as the absence or inadequacy of sewage systems.

When it comes to surface waters, we should think of oceans, streams, lakes, and seas. In our country, which is surrounded by seas on three sides, marine pollution is of great importance.

3.1. Marine Pollution

- Use of the seas for transportation and tourism purposes,
- Domestic wastes and industrial wastes are given to the seas without any or adequate treatment,
- Oil spills that occur as a result of marine accidents,
- Leaks from platforms and pipelines established in the seas,
- Garbage is carried to the seas through streams and streams

3.2. Riverwater Pollution

- Chemicals and fertilizers used in agriculture,
- Factory wastes,
- Garbage carried by small streams,
- It is the descent to the earth with precipitation as a result of air pollution

3.3. Lake Pollution

The main causes of lake pollution can be said to be pollutants and acid rain carried by the streams they feed on.

In our country, the “priority environmental problems according to provinces” classification has been made and with the 2016 data, the water pollution problem (30 provinces) has come first and managed to become a priority environmental problem. The environmental problems that follow it are air pollution (26 provinces), waste (21 provinces), noise pollution (3 provinces), and erosion (1 province).

Water pollution; Water pollution, which is stated as the priority environmental problem in 27, the second in 30, and the third priority in 16 of our 81 provinces in our country, stands out as an important environmental problem in a total of 73 provinces.

Turkey’s Environmental Problems and Priorities Assessment Report 2 When Turkey’s hydrological basins are taken into consideration, it can be said that the provinces where water pollution is the priority problem are concentrated in the Meriç-engine, Susurluk-Gediz, Kızılırmak-Yeşilırmak, Eastern Black Sea-Coruh, and Van Lake basins. ((Turkey Environmental Problems and Priorities Assessment Report, 2019)

- Not building factories close to clean water sources
- Reducing the consumption of cleaning materials and similar measures can be taken.

5. Preschool education and water pollution

The process of providing children with an environment opportunity suitable for their developmental levels, supported by various stimuli, supporting all developmental areas of the child, developing their creativity, and gaining a planned behavior is called “preschool education” Individuals gain some basic knowledge and skills that will support what they will learn in adulthood in the preschool years, which starts at birth and lasts until the day the child starts primary education.

When we look at the developmental characteristics of the children of this period, it is seen that these years are curious, willing to explore, inquisitive, have high learning ability, are creative, and have the highest learning potential. For this reason, a qualified environmental education given in this period is of vital importance to raising environmentally sensitive individuals. (Çoşanay, 2018)

In particular, providing environmental education to young children is the most important investment to be made to live in a healthier world. (Karatas, 2013). Attitudes and behaviors acquired in the preschool period, which are seen at a young age, turn into a permanent identity structure when you become an adult. The environmental awareness gained by individuals in this period enabled the development of a positive attitude towards the environment in the following years. (Saz, Osmanpehlivan, Demir and Bay, 2020)

Environmental education should start at the home of the preschool child and in the immediate vicinity and should be developed with the education given in educational institutions. In this process, the duties of teachers are very important. Teachers need to be more aware. It should ensure that children participate in afforestation activities and social activities related to the environment. (Akçay, et al. 2017)

Among the reasons why environmental education is important in the preschool period

- a) To raise sensitive generations to restore the ecological balance, which has deteriorated as time passes due to the harmful behaviors of individuals,
- b) To provide information about nature and the environment by providing a program suitable for children,

c) Children who have experience with the environment in the preschool period are expected to be individuals who can protect the environment and take precautions against any environmental threat,

d) From a social point of view, environmental education that can be given to preschool children is becoming compulsory day by day.

To develop these educational environments, it is important to determine the thoughts and understandings of preschool students about water. The earlier the students' prior knowledge is determined, the better their thoughts can be examined in all aspects (Ahi, 2017).

6. Objectives to be gained in environmental education

- Environmental awareness
- Environmental information
- Environmental skills
- Environmental attitude
- Environmental involvement

It can be examined under five headings.

6.1. Environmental Awareness

We can express it as the understanding of the importance of environmental sensitivity and protection by people. While supporting the formation of environmental awareness in the individual, it is necessary to allow them to use the skills gained. In a study conducted on preschool children, it is seen that as the age of children increases, there is an increase in their environmental awareness levels. (Kahrیمان Pamuk, 2019)

6.2. Environmental Information

It is aimed to gain information about the duties of the environment, people's interactions with the environment, people's responsibilities towards the environment, how environmental problems arise, and how environmental problems can be solved. (Kahrیمان Pamuk, 2019)

6.3. Environmental Skills

We can explain what the environmental problems are and the acquisition of skills as a result of the research on this subject.

According to the research, when the education program was examined, it was seen that children were given environmental knowledge, but very little space was given to environmental responsibility and skill acquisition. In this case, it is not expected that an increase in children's behaviors and environmental skills will be observed. (Kahriman Pamuk, 2019)

6.4. Environmental Attitude

- It seems that the attitudes of individuals towards the environment are difficult to observe. Attitude is the individual's guidance of his actions without putting them into behavior.

- When the researches are examined, it is seen that environmental attitudes and behaviors towards the environment are confused. (Kahriman Pamuk, 2019)

6.1. Environmental Involvement

- We can explain environmental participation as individuals who have developed awareness of the environment to take an active role in environmental issues and against environmental problems and to encourage them. (Kahriman Pamuk, 2019)

7. Methods and techniques

It is possible to specify some of them in items as follows.

- Project Approach
- Educational drama method
- Collaborative teaching method
- Problem-solving method
- Brainstorming technique
- Excursion-observation method
- Question-and-answer technique
- Experiments
- Concept maps and concept cartoons

8. Related research

According to their research, Yılmaz and Yanarateş (2020) investigated the determination of the metaphorical perceptions of pre-service teachers, who have a great responsibility to society and will be the teachers of the future, about water pollution through data diversification. The research was carried out with

the participation of pre-service teachers from 11 different departments studying at a state university. In the study, 4 different applications consisting of qualitative and quantitative research methods were made. It is thought that this research, which was carried out by drawing attention to the issue of water pollution, will contribute to the literature, and the perceptions of pre-service teachers have been discussed from many different perspectives and mutually supportive results have been reached. In their research, Güzelyurt and Özkan (2019) aimed to examine which topics are covered by the picture books prepared for environmental education, which are suitable for the preschool period, and for which purposes environmental education is prepared. The study group of the research consists of 50 illustrated children's books determined by the criterion sampling method, which is one of the purposive sampling methods. Children's picture books were examined by document analysis method, which is one of the qualitative research methods, and analyzed by content analysis technique. It was concluded that the majority of the books examined within the scope of the research were insufficient in terms of explaining the love of nature, environmental problems, and why precautions should be taken for environmental problems. In addition to these, it was determined that 10% of the books examined were water pollution, 8% environmental pollution, climate change, global warming, 6% air pollution, melting of glaciers, 4% concretion, acid rain and 2% of the waste not being lost in the universe.

Saz, et al. (2020) aimed to examine the perception of environmental pollution of preschool children in their research. In the study, the art-based research method, which is one of the qualitative data collection methods, was used. 17 children from the age group of 5 years of kindergarten participated in the study. It was collected through pictures and semi-structured interviews with children. The researchers examined the pictures one by one and determined each indicator. While 1 of the children was making drawings for water pollution; 15 of them made drawings on pollution on land. A child, on the other hand, dealt with both water and land pollution in his painting. In addition, no drawings of air pollution were found. Environmental pollution has mostly been shown through plastic, packaging packages, papers, glass wastes, metal wastes, garbage cans, recycling bins, and foodstuffs.

As a result of the research, it is thought that the reason for the low variety of environmental pollution in children's pictures is that the limited experiences of the children as well as their environmental awareness cannot be developed sufficiently.

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CHAPTER IX

1. AIR POLLUTION AND PRESCHOOL EDUCATION

1.1. What is Air Pollution?

The problems of air pollution and environmental pollution were first noticed after the Second World War. It was thought that air pollution was entirely due to industrialization and was experienced only in these regions. People living in places other than these regions were unconsciously and insensitively unaware of the seriousness of the situation and did not have anxiety (Altınsoy, 2018; Özdemir, 1997).

In a world where people focus on production and consumption, it has not avoided harming nature as well as production. With the acceleration of technology, air, soil, and water have been polluted in some way; these have consciously or unconsciously brought harm to nature (Özenoğlu Kiremit, 2015).

All nature and the balance of nature are a whole. The problem that occurs in a place shakes the ecological balance and gradually disrupts it. Buddha affects all living and non-living beings in nature. Because this balance is interconnected. It will become a global problem and cause major problems such as increasing population growth, world wars, consumption of all natural resources, and environmental pollution (Altınsoy, 2018; Gormez, 1991).

If we divide air pollution into two important groups, can be divided into natural causes (fires, volcanic eruptions, storms, etc.) and human-induced secondary causes, that is, artificial causes (industrialization, city life, etc.) (Çakır Sümer, 2014). The return of all pollutants mixed with the air, whether natural or artificial, after the spread, is also chemical (Özenoğlu Kiremit, 2015).

The main cause of all this air pollution is the damage to nature. As long as we do not disturb the balance of nature, nature will provide us and our generation with sufficient resources. Education is of great importance at this point. Environmental awareness gained with education will cause awareness in individuals. Individuals' perspectives towards the environment and nature are shaped in line with the attitudes and behaviors shown. The individual is

expected to behave collectively, not just as himself. The higher the awareness of the individual, the more important the environmental awareness he perceives will be. A person, who has many experiences from the day he is born to the time of death, has a great responsibility in exhibiting the culture of the environment he lives in, all his attitudes and behaviors (Köşker, 2019).

It was realized in the 2000s that environmental problems are a global problem that is not regionally sourced or country-based. Air pollution, which is known only as air and water pollution and is thought to be mostly concentrated in industrial areas, affects many things such as the death of living species, chemical toxins, climate change, thinning ozone layer, and pollution of the earth's waters. Human beings, who will be affected even by polluted waters, will be destroyed in every way, physical and spiritual. Since it is a global problem, it should be considered everyone's problem, whether it is advanced countries or backward countries, and it should be known that everyone will be affected by these problems (Altınsoy, 2018; Özdemir, 1997).

1.2. What are the Causes of Air Pollution?

Mankind has used resources unlimitedly without thinking about the future years with the idea that they dominate nature. And it has always failed to harm nature. Since primitive times, it has harmed the environment and nature in some way with the development of technology. When they realized that resources were not unlimited, people could not get out of the vicious circle of this situation. An unmanageable situation has been created (Altınsoy, 2018; Gökdayı, 1997).

With the development of technology, fabricated products, and wastes from the factories where they are manufactured are one of the most common causes of air pollution. In ancient times, people could somehow produce their production, urbanization was not so much and the population rate did not increase so much. Since almost everything produced in today's world is the result of industrial activities, the pollutants dispersed into the atmosphere have increased. For example, the smoke of coal used due to gas and fog emitted from a car or heating somehow spreads into the air and harms nature (Özenoğlu Kiremit, 2015). The structure of nature, which deteriorates due to the influence of living people, many wastes that come out with consumption and the inability to recycle them in nature are the main causes of environmental pollution (Altınsoy, 2018; Kislalioglu and Berkes, 1985).

The inaccuracy of the chosen location or the inadequacy of the measures taken are the main causes of air pollution in industrialization. Since the use

of fuel will increase in proportion to the population density, there is also air pollution caused by heating in cities. Along with the population, the increase in the use of individual vehicles, wrong urban settlements, all the structures and lack of green areas, and the use of harmful fuels also cause air pollution. It plays an important role in the pollution brought by the wind from outside, together with the air carried. Air pollution affects all living and non-living beings. It will inevitably affect mass deaths in lakes or the extinction of species in the long term (Çakır Sümer, 2014).

Since human beings are intertwined with technology (car exhausts), airplanes, etc., the gases that pollute the air released by vehicles are at the top of the chemical pollutants. On the other hand, the care products used have made it inevitable for artificial (artificial) gases to pollute the air with the gases they emit into the air (Özenoğlu Kiremit, 2015).

1.3. Harmful Effects and Consequences of Air Pollution?

We know that air pollution primarily harms people. However, it also affects plants and animals, which are other living things in nature. Depending on the duration and intensity of the pollution emitted in the air, its negative consequences on living things occur. This can appear as a mass death or a different disease in certain species years later. For inanimate substances such as stones, minerals, etc., which have been found in the world for hundreds of years, the result is that they are adversely affected. Chemicals accumulated in the air fall into our nature in the form of acid precipitation and affect all living and non-living beings. The reason for mass deaths is due to these. Another effect is the presence of many harmful gases that deplete the ozone layer. Methane gas, which is one of them due to the thinning ozone layer of greenhouse gases, affects skin cancers (Özenoğlu Kiremit, 2015).

If the dust that causes air pollution is smaller than 5 microns, it passes into the bloodstream through the lungs. If they are much smaller than 5 microns, they damage the human body remain in the lungs, and cause health problems such as respiratory problems. Again, these dusts protect our vitamin D from the sun. Rickets is the name given to the softening and weakening of the bones, which is usually seen in children due to excessive and long-term vitamin D deficiency. In addition to vitamin D deficiency, hereditary problems can also cause rickets in rare cases (Özenoğlu Kiremit, 2015).

Vitamin D helps the human body absorb calcium and phosphorus from food. Not having enough vitamin D makes it difficult to maintain proper and

healthy levels of calcium and phosphorus in an individual's bones. This can cause rickets in children who are in developmental age. As a result, these reasons cause an increase in rickets and tuberculosis, a lung problem, caused by vitamin and mineral deficiency, which are among today's diseases. Chemicals and heavy metals in the atmosphere are very harmful to the human body. Digestive problems originate mainly from the intestines in our body and kidney diseases caused by the fact that the pastries, which are another important organ of ours, filter them. When carbonaceous hydrogen gases are taken by direct respiration, they cause cancer formation of organs (Özenoğlu Kiremit, 2015).

1.4. What are the Measures That Can Be Taken Against Air Pollution?

Due to the destruction of nature and general problems, people have tended to find solutions in some way. In the pieces of training given, people should be given behavior by taking into account the requirements of the age and the needs of the general society (Altınsoy, 2018; Ozer, 1993).

Smoke, fog, gases, and clouds of dust produced by a certain amount of pollution of the air harm all human, animal, plant, living, or non-living beings.

According to Çepel (1994), the measures that can be taken for these damages are listed below.

- Using chimney strainers to prevent escaping gases
- Switching to a fuel application sparingly without being indiscriminate
- Since the gases of substances such as coal harm nature, switching from fossil fuels to natural energy sources, that is, renewable energies
 - The catalytic converter aims to mix the toxic gases generated during combustion and coming out of the vehicle exhaust into the air as clean as possible. Inside the catalyst, there are special materials coated with zircon dioxide. Toxic gases undergo a chemical reaction as they pass through the area where these materials are located. Through a reaction called final combustion, the toxic gases become less harmful and exit the exhaust pipe and enter the air. Thus, using such tools is very effective in preventing air pollution.
- To make use of rail systems such as underground trains to prevent pollution in public transportation and to reduce the density of individual vehicles
 - Opting for unleaded gasoline as fuel
 - Avoiding crowded traffic density
 - To increase the number of greenery in the name of clean air, clean nature, and life, and to increase parks and recreation areas in urban life

- Paying attention to the type of fuel and controlled use of fuel in residences
- To convey the reasons and what needs to be done for the sake of the future, to raise awareness on this issue, and even to focus on education and training
- To direct our conscious people to contribute to legal regulations

Public participation should be ensured in the legal regulations issued by public institutions to prevent air pollution, and personal, national, or global reactions are given on this issue laws are enacted, awareness is instilled and studies are carried out with many organizations and institutions. All kinds of precautions are taken. In particular, measures are taken in terms of education and economy. In particular, these measures are taken in developed countries and countries with high air pollution increases. Air pollution during the winter months and as a result of industrialization and urbanization with the increase in fuel demand shows its intensity at these times. Due to these problems, legal arrangements have been made and people have started to organize in this regard. Of course, this is a global problem and concerns not only some countries but also all humanity (Çakır Sümer, 2014).

1.5. Current Air Pollution in Turkey and Other Countries

When the air pollution report was examined, it was revealed that air pollution even resulted in death. Every year, there are deaths, six hundred of which are children, out of seven million. It causes \$2.9 trillion in damage to the worldwide economy. According to the results of the report, ten percent of the world is exposed to external polluted air. People living in cities with more intense air pollution are more at risk of breathing this air (BBC, 2021).

The fact that factories and production were suspended for a while due to the coronavirus epidemic that came as of 2020 has been very effective in reducing air pollution. In 84 percent of countries and 65 percent of cities, this rate has changed positively. With the lifting of the prohibitions after the pandemic, there may be an increase in air pollution again. In the report, it is shown that East and South Asian countries are the first to lead the way in air pollution. According to the report, the top 50 cities with the highest air pollution are the provinces of countries such as Pakistan, China, India, and Bangladesh. In this report, which includes 96 countries, Turkey ranks 43rd and the city with the most intense air pollution is shown as Çorum (BBC, 2021).

1.6. Air Pollution in Konya and Its Causes

It will be useful to examine the studies carried out to examine the change in the air pollution level of Konya over time.

In his study, Bozyiğit (1996) attributes the cause of the current air pollution in Konya to two reasons. These are natural and human factors. Since the location of the city on the map and its climate cannot be changed, it is stated that it is necessary to focus on human factors as a solution to air pollution. In the research, several suggestions have been made that will be beneficial in preventing air pollution. Some of these are;

- Instead of coal, which is an important factor in air pollution, natural gas should be brought to the city and used in homes.
- Carrying out greening works in different areas of the city.
- Caution in the selection of industrial zones.
- Directing and encouraging the community to use public transport instead of private passenger cars.
- That it should turn to renewable energy sources.

Çiftçi, Dursun, Levend, and Kunt (2013) state in their study that industrialization is the basis of air pollution in Konya. In particular, they emphasized the importance of industrial zones. As a result of the research, several suggestions were made. Some of these are;

- When choosing industrial zones, they should be especially outside the city centers.
- Installation of filters in the chimneys of factories located in all production sites or industrial zones.
- Directing the main roads passing through the middle of the city to ring roads to relieve traffic.
- Creation of settlements taking into account the wind factor.
- Raising public awareness from the beginning of formal education and increasing the work of CSOs in this field.

In their study, Kara, Yalçınkaya, Özdil, and Avcı (2018) examined the air pollution level in Konya province between 2012 and 2017 in terms of some variables. As a result of this research, a serious increase in the level of air pollution was detected, especially in winter. As the main reason for this increase

in the winter months, it has been concluded that the fuel used in homes is coal. The quality of coal used in people's homes has been cited as another factor in air pollution. It has been understood that the number of households with natural gas available in Konya is still high and more families still use coal. Another reason for air pollution in the province is the geographical region where it is located. Konya is located in the center of Turkey and is located on a basin, so it is an advantageous region for industrial branches. Air pollution is increasing since the concept of green belt, which is important in the establishment of a planned and orderly city, is not used for Konya and the gases coming out of the chimney reach the city center due to the problems experienced in the planning of industrial zones.

2. Air Pollution in Preschool Education

Preschool, which is important for children, is a holistic development period. It provides the fastest characteristic development in terms of both emotional, mental, and bodily functions. It is also a big step for children in later years. Studies have mentioned and proven the importance of studies to gain these skills in completing all attitudes and behaviors for children's education after the family (Altınsoy, 2018).

To explain with the saying that the tree bends when it is old, this consciousness, which is instilled at a young age, will cause us to carry the value we give to our environment to the future more beautifully. For an individual, the preschool period has an important place. All the achievements and attitudes that the person learns during this period in which his character is formed are a step forward. The environmental awareness given at these times will show the positive attitude of the person years later. This period, which covers the age range of 2-6, is the most important turning point of the development process. For this reason, these periods are of great importance for environmental awareness and education (Saz et al., 2020). Environmental awareness gained in preschool, which is an important period of the child (2-6) years of age, helps him to develop more conscious behavior and acquire a positive attitude toward his environment (Basil, 2000; Buhan, 2006).

Organizing trips to introduce nature will attract the attention of children and they will better understand their perception and awareness. It will be a one-to-one learning situation that we do not only live in this world and that we should not be selfish in this regard to think about future generations (Altınsoy, 2018).

This period, in which children tend to get answers to the questions they ask with curiosity and their ability to establish cause-and-effect relationships, should be given great importance and this awareness should be instilled in children. The training to be given should be evaluated in detail in every aspect during this period (Kesicioğlu and Alisinanoğulları, 2009; Ozbey, 2006).

For children to evaluate the events holistically, concrete data should be presented to children, storytelling should be used in the form of games, and the opportunity to discuss among themselves in science activities and nature activities should be provided (Demiriz, 2001; Kesicioğlu and Alisinanoğulları, 2009).

Individuals who have created awareness of recognizing and protecting the environment have also become aware of environmental education. Environmental education should be presented in a diversified manner, taking into account the levels and the age of the individual (Saz et al., 2020). Another research that supports this situation states that diversification is important at this point for individuals to gain environmental education considering their age and levels (Gülây and Ekici, 2010).

Emphasis should be placed on the diversification of educational programs that include environmental awareness and environmental education in preschool education. The needs in this regard should be determined and enriched training programs should be increased. In these programs to be given to students, the teacher is of great importance. For this reason, it will contribute to themselves and the children if the teachers who will provide this training make progress with examples in raising environmental awareness among children. To gain environmental awareness, it is necessary to raise awareness among teachers and to educate them on this issue (Koçak Tümer and Temel, 2018). To create a better world, it is important to educate individuals on this subject from a young age (Karataş, 2013).

The pre-school environmental awareness education given to these children who grow up in urban life allows them to make one-to-one observations and groupings. Children gain an active and playful gain with these direct experiences (Buhan, 2006).

Due to today's conditions, neither children nor adults can be intertwined with nature. With urbanization, these opportunities remain very limited. Children who cannot meet and mingle with nature are not aware of the importance of this. Many of these achievements are given to students in the preschool period. Many of the attitudes and behaviors acquired at this age are carried over to later

years. For these gains to be realized positively from childhood to adulthood, environmental education should be provided to children in all aspects of the preschool period (Ogelman, Güngör, 2015).

First of all, education for the child begins in the family. For this reason, families should be aware of this issue. When necessary, cooperation should be made with the school-parent association. Posters and posters should be prepared at the school about environmental awareness, and parent letters should be sent to families. For the theory to turn into practice, it should be ensured that the attitudes of the children go parallel both at home and at school. After the education that starts in the family, children spend their most effective periods in the preschool period between the ages of 2-6. In this important and effective period, environmental awareness should be intensively emphasized and awareness should be created. First of all, it is of great importance that preschool teachers, who are role models, are sensitive to environmental awareness and can instill this in their students (Altınsoy, 2018).

When children's pictures were analyzed, it was observed that children gave more place to environmental pollution in their pictures compared to the clean environment. It has been determined that soil pollution is mostly included in children's paintings, sea pollution, water pollution, and air pollution remain abstract in children and their awareness is lower on this issue (Saz et al., 2020).

In his research, Özsay (2012) explained the basis of children's limited knowledge about environmental problems as their lack of experience as a result of examining children's perceptions of the environment with the pictures they made. On the other hand, the reason for the low perception of children towards the environment was insufficient experiences and in addition to this, awareness. The inadequacy of the education and achievements given in the preschool period kept the perception of environmental awareness low. Preschool children with environmental awareness are more sensitive and more conscious of protecting the environment (Saz et al., 2020).

In his study, Şahin (2008) aimed to explain how preschool children characterize the environment and what are the perspectives and factors affecting them. The study examined whether the concept of an environment of preschool children is affected by the social and economic levels of the region they live in and their families. The study was carried out in 14 preschool classes with different socio-economic levels living in different residential areas in a city in the Black Sea region. The research was conducted using qualitative techniques. Data were collected according to research techniques. According to the results of the study,

the concept of environmental awareness of students with low-income levels was also low, and the environmental awareness and environmental awareness of student groups with high socio-economic levels were higher. The environmental awareness of the low-income group was lower, and the environmental awareness of the high-income group was higher.

3. What to Do in the Preschool Period and Activity Example

What can be done in the preschool period is listed by Altınsoy (2018) as follows;

- Bringing our creatures living in nature together with children in a learning environment and being able to transfer their care will make them more responsible in this regard.

- By activating children's empathy skills, stories can be created and animated about introducing domestic or non-domestic animals, expressing that we have responsibilities towards them, and the need to be sensitive to the habitat of animals.

- Since one-to-one learning will be more beneficial than indirect or abstract learning, curiosity and interest in nature will be increased if it is supported by nature-themed paintings, visual materials, and documentaries for children.

- In the child, the terms of nature do not remain abstract; The words in the content of the songs or rhymes in the activities to be embodied with examples should be presented by originating and analyzing.

- Artistic activities in the works can be presented with materials collected from nature and they can be introduced more closely.

- They may be asked to draw nature-themed pictures. The use of recyclable materials for nature protection can be requested from materials at home to prevent waste generation.

- In terms of the importance of recycling, these boxes should be kept in the classroom, and the materials that can be recycled should be thrown into this box. Support should be obtained from the municipality in this regard.

- The concept of environment should be presented to children at every stage and attention should be drawn by integrating them with other subjects without limiting environmental activities.

- Experiments that comprehend the functioning of the systems that describe the life cycles of all living things in ecological balance can be carried out and the observations as a result of the experiment can be presented to the children and everyone's ideas can be obtained.

Event Example;



Ingredients

1. Cardboard
2. Electrical tape
3. Cardboard
4. Adhesive
5. Crayons

The ground with mountains, rivers, clouds, and sun-like figures is prepared before the event. In the classroom, air pollution is mentioned, the importance of trees in preventing air pollution, and then tree templates are given to the children. The children paint the given tree templates in the color they want. On the ground prepared in advance, each child places his tree wherever he wants. The children chatted about the resulting painting and the painting is hung in a corner of the classroom.

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CHAPTER X

1. TECHNOLOGY POLLUTION AND PRESCHOOL EDUCATION

1.1. Technology Pollution

Throughout history, it has been known that many different energy sources can be used by human beings purposefully or randomly. However, this interaction continued in harmony with the natural carbon cycle until the last 200 years. So what has happened or changed in the last 200-250 years? The world was introduced to the coal mines in Sheffield, England, and the Industrial Revolution, which created a new production system that had not been seen and used until that time. Coal has affected the way and amount of iron, which is the basis of the industry used even today. In the following period, industrial production and energy growth continued by supporting each other (Yılmaz and Kılıç, 2018).

The amount of greenhouse gases in the atmosphere has gradually increased due to the Industrial Revolution, which started to develop in the early 1900s, the increase in the use of fossil fuels such as oil and coal, technological developments, and the increasing need for energy due to these developments, and new unnatural human activities. This increase began to shake the balance of nature, which makes life sustainable in its natural system. Many technological habits that we actively use in our daily lives and make our lives easier have started to cause an increase in greenhouse gases, which are one of the causes of climate change (Bahçeci, 2019).

The demand for resources and services created by the rapidly increasing population has been met to some extent with the increase in efficiency and product achieved by industrialization. However, this situation has led to more demands due to further population growth, which has become a vicious circle until today. As a result, it has become inevitable to extract, process, and distribute more natural resources and return them to the environment as waste. In this way, industrialization has emerged as the human activity that causes the most harm to the environment (Özdemir, 2017).

Large-scale industrial and technological advances have caused two major problems. The first of these is the destruction of the natural environment by excessive pollution. Excessive pollution has threatened the life in nature and destroyed it in a chain manner. The second is the problem of overconsumption of natural resources, and the use of natural resources, oil resources, minerals and mines, and forests, in a way that cannot be replaced.

The fact that countries compete in terms of technological development and economy has caused the world trade volume to grow, move, and reach a size that exceeds the borders. Rapidly developing industrialization and urbanization, developments in technology and economy, and modernization in agriculture have disrupted the balance of resource needs. In the face of these developments, on the one hand, the continuation of humanity is being ensured, on the other hand, the needs of future generations are being consumed at an incredible speed. In this way, the main purpose of sustainability, on which development is based, disappears, and while the use of natural resources for today's needs is ensured, the opportunities to meet the needs of future generations are irresponsibly destroyed (Baykal and Baykal, 2008).

Since the Industrial Revolution, human beings have thought of the developments in technology as a path that leads to happiness. However, the atomic bombs dropped on Hiroshima and Nagasaki in World War II changed this view and the view that advanced technology has many harms as well as possibilities has begun to form.

The fact that people and developing technology cause problems that can bring the end of life has paved the way for the questioning of existing production and consumption systems (Yılmaz, Yılmaz Bolat, Gölcük, 2020). Since the 20th century, environmental problems have become a common problem in all countries on a global scale, but problems such as climate change, water, and air pollution, global warming, and ozone depletion are still considered among the serious environmental problems that threaten the health of nature and human beings (Sonneld and Mol, 2002, Cited.: Yılmaz, Yılmaz Bolat, Gölcük, 2020).

Environmental pollution refers to air, water, soil, and noise pollution in the most general sense. As a result of industrial activities, polluting factors such as solid and liquid wastes, gases and particles, radioactive wastes, and noise are released (Es, 2011).

Air pollution; also occurs due to many natural reasons such as the eruption of Yanar Mountain and the rise of underground gases to the earth. However, nature can eliminate this pollution in its cycle. The rapid increase in the use

of technological devices, industrialization, and industrial developments caused air pollution to increase far above natural pollution, breaking the self-cleaning power of nature (Özçelik, 2018). Causes: incineration of garbage, consumed fossil fuels, radioactive rays. Consequences: Global warming, acid rain, fog formation, ozone layer damage (Erten, 2004).

Water pollution: It can be expressed as the mixing of foreign substances into the water to the extent that it impairs the quality of the water. Water pollution can occur in two ways. The first is the introduction of impurities into the water due to natural causes such as erosion, and the second is its contamination by human influence. Human impact is in the form of releasing unwanted substances into the water because water is considered a place to leave waste. This situation is causing more damage to water resources day by day and negatively affecting their sustainability (Özçelik, 2018). Causes: Excessive fertilization, tanker accidents, uncleaned domestic and industrial wastewater, and chemicals. Consequences: Pollution of drinking water, pollution of rivers, mass deaths of marine creatures, and proliferation of epidemics (Erten, 2004).

Soil pollution can be considered as the physical, chemical, biological, and geological deterioration of the soil and its structure. Human activities sometimes directly cause soil pollution, and sometimes soil pollution occurs as a result of water and air pollution. It occurs as a result of pesticides, wrong agricultural techniques, and leaving toxic substances in the soil (Özçelik, 2018). Causes: Litter and garbage piles, fertilization work, acid rain, pesticides. Consequences: Change in the PH- value of the soil, increase in the density of heavy metals in the soil, and deterioration of aesthetics (Erten, 2004).

With noise pollution, technological advances, and a rapid increase in the quality of life, noise sources and impact values have also increased rapidly. Public vehicles (planes, trains, buses, ferries), private vehicles, manufacturing and factories, electrical kitchen appliances, and ventilation equipment used for a comfortable life have become sources of noise that disrupt people's health and peace (Çepel, 2006).

2. Historical Development of Approaches to Environmental Problems

The search for solutions to the environment, which started in the 1970s, was mostly based on the prevention of pollution. The technologies that developed based on this principle were those that were used after the release of pollutants into water, air, or soil was completed. For this reason, they are relatively low-efficiency technologies that require high energy and materials.

In the 1980s, another approach began to gain attention: industrial ecology. This approach aims to understand the flow of energy and matter in industrial systems, the effects of this flow on the environment, and the effects of technology and applications on this flow. However, industrial ecology includes the recycling of wastes as inputs by examining the production stages and the rearrangement of the product by considering the effects of the product on the environment.

In the 1990s, these approaches included the total quality approach. The basis of this approach is that companies and consumers have a common attitude in determining environmental education, management strategies, and measurements. The total quality approach includes offering new possibilities such as energy efficiency and reuse and recovery of materials by reducing waste. Today, a new one of these approaches, “clean production”, has been included (Yücel and Ekmekçiler, 2008).

Cleaner production is the continuous use of processes and products that will prevent pollution of water, air, and soil, eliminate wastes at their source, and minimize the damage to people and the environment while increasing efficiency. The basic principles of cleaner production are to take into account preventive approaches, not corrective and cleansing, for pollution control, to reduce waste by using less raw materials and energy, to improve technological processes that will ensure the best use of natural resources, and to develop new processes. Clean technologies are part of sustainable production.

Today, unlike in the past, the ideas of polluting the environment as little as possible, cleaning the polluted places, the polluter covering the cost of pollution, environmental degradation is a price to be paid for economic development, natural resources are inexhaustible, water and air are free resources have changed (Baykal and Baykal, 2008).

3. Environmentally Friendly Technologies

Technologies that emerge as a result of social and economic activities, minimize the harmful effects on human and environmental health, use natural resources more efficiently, and make all of them sustainable are expressed as “environmentally friendly technologies” (Halkman, Atamer, and Ertaş, 2004).

Technologies to eliminate the harmful effects that occur as a result of a process: These are technologies that intervene in the wastes and other damages that occur as a result of production without changing the production process.

Technologies that minimize raw materials, auxiliaries, natural resource inputs, and waste outputs by changing the process: They are

aimed at changing the production process and the way of production. They are processes and end products that use less water, energy, and chemicals, work efficiently, and produce less and more harmless waste.

Recycling and reuse technologies: These are technologies that prevent damage to the environment by converting wastes and waste materials into new materials by ensuring their reuse, throwing them into the environment, and reducing the consumption of natural resources.

Traditional and old environmentally friendly technologies: These are technologies that do not harm the environment and are already environmentally friendly due to their characteristics (Halkman, Atamer, and Ertaş, 2004).

Today, as long as the current energy system continues to develop, it is not possible to achieve environmentally friendly development goals. The realization of sustainable development depends on the harmonious use of renewable resources, high energy yields, and advanced technology (Uzmen and Arar, 2001).

The way to prevent environmental pollution caused by developing technology is to use scientific findings and technology effectively. With technological measures, it can be ensured to a large extent that wastes can be treated and rendered harmless. However, these measures impose large operating costs and additional investment. Therefore, the expenditures to be made should be made by considering the effects of the wastes to be treated on the natural environment and the different benefits to be provided. In particular, industrial wastes (mineral oils, heavy metals, various toxic gases, radioactive substances) that have toxic and permanent effects on ecosystems should be controlled and treated first (Baykal and Baykal, 2008).

It is possible to bring industry and technology choices into a form that we call eco-technology. Manufacturing units should work to develop new technologies to make the best possible use of the resources they use, to limit waste, to reuse waste, and to keep resources clean (Es, 2011).

4. Reduce, Reuse, Revert

Reduce:

- Products with less packaging should be preferred.
- When buying fruits and vegetables, less packaging should be used.
- It should be preferable to buy products in large quantities. One large packaged product contains less packaging material than two small products.
- Packages that can be used repeatedly should be preferred.

- Instead of paper napkins, cloth napkins that can be used repeatedly should be preferred.

Reuse:

- Unused clothes can be given to the poor in need, in orphaned homes, or sold as second-hand goods.
- Materials such as empty bottles and boxes can be turned into products that can be used for different purposes by using creativity (Özarslan Aktar, 2017).

Recycle:

- Aluminum cans can be recycled with 5% of the energy of reproduction. The energy gained by a returned box is equivalent to a television being on for 120 minutes.

- A returned glass bottle requires half as much water to produce a new one. It is equal to having a 100-watt light bulb on for about 4 hours.

- Paper produced from recycled paper is equivalent to 60-70% less energy and 55% less water use than producing a new one.

- Recycled newsprint with a height of one and a half meters or 700 shopping bags is worth a tree (Özarslan Aktar, 2017).

6. Some Suggestions We Should Apply in Our Daily Lives for a Sustainable Life

- Renewable energy sources such as wind and solar can be used in living spaces.

- Be economical in energy use; Use energy-saving light bulbs, turn off unnecessary burning lamps, do not over cool/heat closed spaces, and have thermal insulation done.

- Unplug electrical appliances when not in use.

- Do not open the door of your oven while it is running. Every time the door of the oven is opened, an energy loss of 20% occurs.

- Instead of supercooling or heating the place where you work/live, we should arrange the clothes according to the environment.

- Washing machines and dishwashers should not be operated before they are full. By implementing sustainable energy consumption, Earth Overshoot Day can be moved forward by 93 days (Aksoydan, 2020).

If we want a healthy and livable world not only for ourselves but also for future generations, measures should be taken now for this purpose. We must

give environmental awareness to every new generation that will be the adults of the future and make them love nature and the environment. The most important responsibility in this regard falls on educational institutions (Özkalp, 1992).

Early childhood is of critical importance for children to gain positive attitudes and behaviors towards the natural environment and for these achievements to form the basis for their future lives. Environmental education to be applied in early childhood is very effective on children's environmental awareness and attitudes. One of the important components that form the basis of environmental education is recycling (Erdaş Kartal and Ada, 2020).

7. Studies on Recycling in Preschool Period

Onur, Çağlar, and Salman (2016), in their studies, aimed to raise awareness of the evaluation of paper waste in children; They concluded that the knowledge of children in the five-year-old age group about the environment, environmental protection, and recycling before education was insufficient. It has been concluded that the practical training given by the researchers on the conversion and use of waste paper into paper by making pulp increases children's knowledge about the environment, environmental protection, and evaluation of solid wastes.

Kara, Aydos, and Aydın (2015) stated that preschool children's attitudes towards the environment in terms of recycling, transportation area preferences, living space preferences, paper consumption, and environmental protection are positive; However, according to the observations, they have concluded that children do not behave in this way in their real lives.

Erdaş Kartal and Ada (2020) conducted a study with 41 children between the ages of 3-6 and the data were collected using the draw-and-tell method. It was concluded that the perceptions of preschool children included in the study about recycling were limited. It has been observed that especially 3-year-old children do not use symbols related to recycling in their drawings. It has been determined that children in the 4-year-old group generally perceive recycling as environmental pollution and throwing / not throwing garbage into the trash, but in the pictures of 5-year-old children, symbols related to the recycling bin, recyclable materials, and separation of garbage are more included.

In another study, the effect of the family participation project method on children between 60 and 72 months making them aware of the concept of recycling was examined. Families; They stated that they gained sensitivity while preparing presentations with their children about the practices related to recycling, which they did not apply effectively in their lives even though they knew it, and that they would put them into practice more consciously in the

future. With this determination, the research can be handled with a different dimension, and project studies with family participation can be carried out to gain environmental awareness (Şallı, Dağal, Küçüköğlü, Niran, Tezcan, 2013).

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CHAPTER XI

TRAINING TURKISH PRESCHOOLERS TO BE CONSCIOUS CITIZEN ENVIRONMENTALISTS FOR SUSTAINABLE COMMUNITIES

1. Introduction

In the last fifty years, there has been a great advancement in the economy, technology, and industry, which has increased the living standards of people all over the world. These advancements have increased consumption in every field. Ecological values like forests, oceans, coasts, and seas have been vandalized and polluted rapidly to meet the increasing demands of the people. Developments and advancements were tolerated and appreciated until environmental pollution threatened the economy, agriculture, and people's health. Fitianos & Samara-Konstantinou [1] warn that the quality of both the natural and the urban environments worsens continuously with consequences that cannot be yet calculated. Nowadays, governments admit that environmental pollution is the most dramatic problem to threaten anything in the world therefore they offer some courses like environmental education for the students by starting their preschool years as a solution to the matters [2-7]. Piaget [8] believes that children in the early period of the learning cycle have 2 stages, which are exploration and explanation.

Literature abounds with arguments justifying the shift towards education for sustainable development because environmental education failed to deliver what it promised [9]. The research done on environmental education in Turkey is not sufficient enough to contribute to preschoolers and elementary students to improve environmental awareness, either [10]. Preschool education which is described as the magic years of life, is of vital importance in respect of child education in various domains [12, 13]. Vodopivec [14] also emphasizes the role of environmental education tasks in the cognitive area as a selection of adequate environmental education content and promotion of children's orientation toward adults.

Training preschoolers should be taken seriously during this critical age in which children acquire basic knowledge, skills, and habits. Therefore, trainers and teachers make good use of this age as the turning point for children in shaping any domain including multiple intelligences [15, 16]. During preschool periods, children are curious and are in search of learning and discovering anything about the life they lead. They learn best during their early years [17]. That is why they are curious investigators to learn anything in the world they live in. They try to make connections between reason-results they meet in daily life. Taking these characteristics of the children's advantage, it is proved that preschool periods is the most suitable stage to accommodate any habits related to daily life and the environment they live in. Environmental education of the children can also be best suited in this period by strengthening the multiple intelligence areas of the preschoolers. Therefore, teachers and educationalists should create a nature-rich school environment to foster preschoolers' various domains dominantly their naturalistic intelligence as Gardner [18] emphasizes in his book. In a nature-rich atmosphere, children may have a chance to use and investigate authentic materials and practice what they learn through their all senses. Environmental education for the early years may tend to focus primarily on young children exploring and enjoying the world of nature under guidance and the companionship of teachers.

Having carried out some titles European Union requires all the candidate countries to take place, Turkey, at the brink of entering the EU has to fulfill the requirements of the EU related to the environment. It is not an easy process for Turkey to carry out all the procedures related to the environment but, Turkey should take necessary precautions to train and educate all her citizens about the environment, pollution, recycling, and used-up batteries starting from preschool to university level.

This study is conducted to build up the knowledge base about environment education, recycling, and disposing of used-up batteries and to support preschool children to acquire environmental consciousness via pre-training activities and their teachers' views and opinions about the environmental education process in pre-training, training, and post-training frames. There is limited attention to student-teacher cooperation about the matter. Therefore, further investigation is needed to view the matter both from preschoolers' and their teachers' angles. Besides this, it is also important to reveal the concrete outcomes of their practices on environmental education and discuss ways to enhance environmental education both from preschoolers and their teachers' views.

The purpose of this study was to put forward the environmental educational process of the preschoolers and their preschool teachers' views in the frames of pre-training, while-training and post-training practices and to determine to what extent the classroom practices would work about environment education, recycling, and disposing of used-up batteries. In the preschool period, children have some idea about living organisms, especially the animals they meet in daily life, and distinguish between living organisms and artificial objects [19].

It is a pity that environmental education has not been carried out in the schools despite it having a vital importance for the nation. Environmental education should be focused on how animal lives depend on ecological factors and how people keep the balance of ecology. At this point, children and their teachers should collaborate and cooperate to find a solution to environmental problems. In this way, environmental education is an interdisciplinary subject and should be a way of lifestyle [20]. It is stated that the preschool years may prove to be critical for the environmental education of the children [12]. Therefore, environmental education should involve activities that help children recognize their environments such as play, music, drama, and art activities.

In this way, children may acquire environmental consciousness and maintain this habit for years long. During environmental education, children should be in the natural life and interact with nature directly [21]. Even though teachers are not held responsible for the current state of the environment, they do recognize a role for themselves in contributing to the formation of environmentally responsible students and future citizens [22].

Environmental education is carried out in three ways. The first one is to train children in the real environment. It aims at presenting children with direct experiences and supports them to acquire positive attitudes towards nature [18]. Investigating in the open air, playing with water, sand, and mud, collecting fallen and yellow leaves of the trees, making nests for the birds, or growing vegetables are among the examples of activities that help children acquire positive attitudes towards the environment.

The second approach is to support children in understanding how natural systems work and to teach them the relations between complex systems of nature and human lives. Water and oxygen cycle, recycling, how vegetables grow, the importance of water sources for human lives, and some basic ecological principles are some of the concepts to be taught in this stage. In addition to this, the fact that children feed domestic animals causes them to be more sensitive to environments and habitats [19].

The last approach is to provide education for the environment, which includes taking some measures for environmental problems. While emphasizing the effective use of water sources, it comprises putting it into practice in our daily lives. Education for the environment necessitates children to have an empathy towards the environment, and dependence to put the knowledge about social and ecological processes into practice.

If we want the children to acquire lifelong environment consciousness and love we should include the three training approaches in question in our curriculum [23].

2. Method

The study has two steps. In the first step, the study was conducted in 4 preschool education institutions taking place in Meram municipality, which is one of the 3 district centers of Konya province with a population of 1.5 billion. 60 preschoolers, 15 preschoolers in each preschool in question above were drawn by a cluster random sampling technique [24]. The names of the preschools are Meram Ali Tasoluk, Meram Ayse Sonmez, Meram Ticaret Borsasi, and Meram Dr. Teoman Bilge primary schools. In addition to this, a project group composed of 6 preservice teachers was involved in this research. In the second step, the preservice teachers' views and opinions in this process will be analyzed in the frames of pre-training,

while training and post-training practices. The aim of the course "Community Service Practices" is to define the community's daily problem, and to defend that the problem is generalizable, really important, and useful to solve, to suggest a solution using field knowledge such as syllabus designing and instructional design about the subject and to attain the solution recommended for the sake of community (www.erciyes.edu.tr).

In the course of Community Service Practices, 4 groups composed of 6 preservice teachers in the Faculty of Education are required to plan and prepare a project for the public interest under the supervision of the researcher. One of the groups of preschool teacher candidates is guided to accommodate recycling and disposing of used-up battery consciousness in the preschools in question above.

3. Result and discussion

In this part, firstly, the preschoolers' training results were taken into consideration.

First of all, the preschools were visited to get permission to conduct the study. The preschoolers were trained for 4 weeks about ecology, clean environment, environment pollutants, especially damages by battery waste, and how to protect our environment from battery waste and, recycling and disposing of them for the future by supporting posters, flashcards, and visual aids. Then, four dustbins were hand-made with the collaboration of the preschoolers as authentic waste boxes instead of getting ready-made ones to make the preschoolers motivated to the matter. The dustbins were ornamented with skulls and crosses, which means danger! Following this, the preschoolers were warned not to touch the used-up batteries with naked hands in order not to harm themselves and they were distributed gloves to collect and handle the waste batteries. The preschoolers were told to reward TL1 and a free battery charger for ten used-up batteries they put in the dustbin. Each step in this study was attained under the patronage of the researcher.

The preschool teacher candidates in the project visited the preschools in question 10 days under the supervision of the researcher after the training on whether the training of the preschoolers about recycling and disposing of the used batteries worked or not. The result was successful. 320 used-up batteries were collected by the preschoolers in question, which was a good start to accommodate environmental awareness. With the help of the school administration and the Turkish Mothers Association, the waste batteries were delivered to the Environment Directorate under the dominance of the Ministry of Environment.

By the end of the training in the project, the preschoolers in question would have acquired the habit that the used-up batteries included hazardous elements threatening ecology and human lives and should not be thrown randomly, should be kept for recycling and disposal of, the component of the hazardous elements in the content of the batteries should be decreased, each battery polluted 4 square meter soil by the mercury which prevented the soil to be productive forever, etc.

Secondly, student teachers' opinions and views about classroom practices in the Community Service Practice course were analyzed quantitatively in the pre-training, while-training, and post-training frames.

Student teachers' opinions and views about classroom practices in the Community Service Practice course in the frame of the pre-training phase

In this process, the pre-service teachers were required to respond the open-ended questions about the practices they applied at the preschool institutions in question above.

They were asked how they felt that environmental education would work in the sample preschool institutions before training activities.

All of the preservice teachers believed that environmental education would work in the sample preschool institutions as they prepared effective instructional designs that would involve any domain of the preschoolers.

The preservice teacher A explained

...I thought it would have worked because I thought that it would have been more permanent for preschoolers and they would like it much more if they were trained by a new and different teacher than their teacher. Therefore, I believe that I would take concrete outcomes as a result of environmental education.

The preservice teachers were asked what their impressions were on the classroom environment, on the preschooler's attitudes and behaviors about used-up batteries, recycling, and keeping environment from the waste before pre-training activities on environmental education.

Some of the pre-service teachers explained not all of the preschoolers were aware of what the recycling dustbins were for although the preschool institutions had some.

The pre-service teacher B quoted

... Although there were dustbins, flashcards, and cartoons about recycling the preschoolers did not have enough theoretical and practical knowledge about the matter.

The pre-service teacher C commented

... Some of the preschoolers were conscious about recycling and they threw junk into the dustbins, but they did not have any knowledge about used-up batteries, bottles, and plastics recycling. The preschoolers perceived environmental cleanliness as not throwing junk around.

The pre-service teachers were required to answer what their impression was of preschool teachers', preschoolers' parents, and preschool principals' attitudes and behaviors about used-up batteries, recycling, and keeping environment from the waste before pre-training activities on environmental education. All of the pre-service teachers explained that the preschool teachers and the preschool principals helped and supported the process wholeheartedly.

The pre-service teacher A noted

... the preschool teachers and the preschool principals showed positive attitudes toward training the preschoolers about environmental education, they were all conscious of environmental education and they helped us as they could do the best.

Student teachers' opinions and views about classroom practices in the Community Service Practice course in the while-training phase

The pre-service teachers were asked to respond to what teaching methods and techniques they used during the training phase of the preschoolers on environment in art, language, play education, and leisure activities.

The pre-service teachers explained that they used various methods and techniques for environmental education in each course including visual aids, authentic materials, communicative activities, drama, story-telling, and flash cards.

The pre-service teacher B reflected

....I used different techniques and methods which are suitable for the characteristics of the course in question. I used showing and practicing in art education; conversation circling, brainstorming, and story-telling in language education; drama and educative plays in play education; slayt showing, and aquarium technique in leisure activity courses.

Student teachers' opinions and views about classroom practices in the Community Service Practice course in the post-training phase

The pre-service teachers were required to respond to what their impressions were on the classroom environment, on the preschoolers' attitudes and behaviors about the used-up batteries, recycling, and keeping environment from the waste after post-training activities on environmental education.

All of the pre-service teachers stated that training preschoolers about used-up batteries, recycling, and keeping environment from the waste had a positive impact on them and raised their awareness about the environment.

The pre-service teacher F explained

.....the feedback from the preschoolers proved that we attained our aim in the study and we are very pleased to see raising awareness of the preschoolers on environmental protection. The preschoolers were

observed to warn each other about a clean environment. As a result of the environmental education, more dustbins and battery recycling boxes were placed in the classrooms by the class teachers. Having trained the preschoolers were seen to be careful to keep their environment and even warn each other not to run the water from the taps in vain when brushing their teeth and washing their hands.

The pre-service teachers were asked what their impressions were of preschoolers' parents', teachers', and principals' attitudes and behaviors about used-up batteries, recycling, and keeping environment from the waste after post-training activities on environmental education.

All of the participants emphasized that preschool teachers and preschool principals were affected by our struggle and they were very pleased when they heard positive feedback from the European Union Coordinators about the process.

The preservice teacher F quoted

.....the preservice teachers were seen to be more conscious and doing more activities about the environment in the classroom. They were observed to encourage the preschoolers to do the right behaviors while correcting their wrong behaviors. The fact that the preschoolers brought the used-up batteries from their homes shows that their parents were conscious of the environment and supported their children's awareness of the environment. Consequently, the school principals catered for more dustbins and recycling boxes for the classes while inspecting the teachers about the process.

The pre-service teachers were asked to explain what teaching methods and techniques they thought were the most effective for the preschoolers in environmental education.

All of the pre-service teachers explained that drama, story-telling, and demonstration were the most effective techniques in the environmental education of the preschoolers.

The preservice teacher D expressed

....drama was the most effective technique for preschoolers in environmental education as they learn by enjoying. In addition to this, I thought that concrete objects like puppets, and authentic materials worked effectively for their environmental education

The pre-service teachers were asked to respond to what preschoolers' parents' roles should be related to environmental education.

All of the participants agreed that the parents are sine qua non for this process and they are even in the center of the education of preschoolers as their training starts with the parents.

Preservice teacher E reflected

...the parents should take place in every phase of training preschoolers. First, the parents should be a good model for their children as they usually do what they see but, not what they were said. Therefore, parents should be conscious of the environment so that their children can raise awareness of the environment they live in.

Some of the teachers commented that the preschool institutions were to be inspected about environmental education for sustainable development while some of them proposed that the parents were to involve in the process actively.

Preservice teacher B noted

.....noise and appearance pollution should be taken into consideration. Lectures and seminars should be organized to make the parents more conscious about the matter. In addition to this, environmental education should be given concrete samples from daily life.

4. Discussion

The study has two phases. In the first phase of the study, the preschoolers were trained for 4 weeks about ecology, clean environment, environment pollutants, especially damage by battery waste, and how to protect our environment from battery waste and, recycling and disposing of them for the future by supporting posters, flashcards and visual aids. At the end of the training, the fact that the preschoolers in question collected 320 used-up batteries, which is a good start to accommodate environmental consciousness shows that the result produced the fruit about the matter [25]. It is also supported by Bögeholz [26] that the first base of improving values and knowledge related to the environment is an interaction with the environment. In the second phase of the study, the preservice teachers' views and opinions in this process would be analyzed in the frames of pre-training, while-training, and post-training practices.

The fact that all of the preservice teachers had a strong motivation and determination by effective instructional design from the first start caused positive

outcomes about environmental education in the sample preschool institutions. It is also supported by Gardner and Hatch [16] by say that trainers and teachers make good use of this age as the turning point of children in shaping in any domain including natural and environmental education.

Because all of the preschool teachers, and the preschool principals in question helped and supported the process wholeheartedly is also emphasized by Appamaraka et al. [27] by explaining that environmental education is the learning/teaching process that encourages the teachers and learners to have an awareness, understanding, concerning and valuing the natural environment. While-training phase of the preschoolers on environmental education all of the pre-service teachers explained that they would prefer using both teacher- and student-centred approaches which could be explained as they would prefer an eclectic method of teaching, the mixture of two approaches [28, 29], including audio-visual aids, authentic materials, communicative activities, drama, storytelling, question and answer. It is also supported by Sornsakda et al. [30] that the instruction of environmental education should emphasize instructional activities related to various kinds of experiences or the surrounding environment of children with their interest and curiosity. In line with this, the teachers should employ different kinds of teaching approaches.

After post-training, all of the pre-service teachers agreed that training preschoolers about used-up batteries, recycling, and keeping environment from the waste had a positive impact on them and raised their awareness about the environment, which is supported in the research carried out by [31]. According to the preservice teachers in question, the preschoolers would have acquired the habit that the used-up batteries included hazardous elements threatening ecology and human lives and should not be thrown randomly, should be kept for recycling and disposal, the component of the hazardous elements in the content of the batteries should be decreased, etc [32-37].

After post-training activities on environmental education, all of the preschool teachers and preschool principals received positive feedback from the European Union Coordinators about the process encouraging and motivating them to be involved in the matter with pleasure as environmental education is not an individual, but a wholistic process to carry out.

All of the participants agreed on the importance of parental involvement in environmental education as an accelerating and motivating factor in their children's education and actively participating parents help their children rightly judge the kind of behavior. It is also confirmed by Henderson and Berla [38],

that parent involvement makes an enormous impact on students' attitudes, attendance, and academic achievement. The resulting partnerships between parents and teachers will increase student achievement and promote better cooperation between home and school.

5. Conclusion and suggestions

By the end of the training in the project, the preschoolers would have had a first step to be conscious about the environment and it would have been a process for creating young environmentalists to protect and preserve their environment. Most of the students were not aware of the dangerous materials they had been using in their daily lives before training. After the training, it was seen that each one is a strict environmental keeper and they collected about 320 used-up batteries. Their preschool teachers also emphasized in the interview that training the preschoolers would work effectively, cause positive change towards the environment, and have a positive impact on them and produce its future. By the end of the training, the preschoolers would have learned that

- batteries are not to be thrown into the fire
- batteries are to be kept covered while carrying
- batteries are to be kept in dark and cool areas.
- batteries are not to be used in high-temperature
- dischargeable batteries are not to be permitted if the producers take necessary precautions to recycle and dispose of the waste batteries.
- City municipalities are to be warned to collect the waste batteries in different boxes.
- the batteries including mercury and cadmium in high proportion are to be limited to produce.
- accumulator producers are to be warned about recycling and disposing of waste accumulators.
- production of rechargeable batteries is to be encouraged by the governments.
- people all over the world are to be warned about the hazardous effects of waste batteries on the environment by mass media tools.
- they are to be introduced and encouraged by solar systems and renewable energy sources.

All of the pre-service teachers explained that the preschool teachers and the preschool principals helped and supported the process wholeheartedly in the process of environmental education of the preschoolers.

All of the pre-service teachers believed that they would prefer an eclectic method of teaching, the mixture of two approaches including audio-visual aids, authentic materials, communicative activities, drama, story-telling, question and answer while-training phase of the preschoolers on environmental education.

Being at the brink of the European Union, all of the Turkish preschool teachers and preschool principals in the study were very willing and motivated to help and support the environmental education process to involve the matter due to the European Union coordinators' appreciation of the practices carried out in their schools.

All of the participants commented that the parents are sine qua non for this process and that actively participating parents would be an accelerating and motivating factor in their children's environmental education and collaboration and partnerships between parents and teachers would produce its fruit for a better tomorrow in this process. They were also of the opinion that all those involving the environmental education process should have been responsible and inspected about what they could have succeeded by the authorities.

It can be put forward that not only should preschoolers but also elementary, and secondary schoolers be trained about the hazardous effects of waste materials on the environment. Children at every level are to be introduced to environmental pollutants by audio visual and mass media tools. Teachers are to be trained as environmentally conscious citizens by in-service courses. The names of the pre-service teachers in the study are withheld for ethical considerations.

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