ANADOLU UNIVERSITY | GRADUATE SCHOOL OF EDUCATIONAL SCIENCES
AJESI
ANADOLU JOURNAL OF EDUCATIONAL SCIENCES INTERNATIONAL

DOI: 10.18039/ajesi.1527069

Evaluation of Eco-School Programs from the Perspective of School Principals: The Case of Bursa Province[1]

Sedanur AY[2], Emin ATASOY[3], Selma GÜLEÇ[4]

Date submitted: *02.08.2024* ***Date accepted:*** *04.06.2025* ***Type[5]:*** *Research Article*

Abstract

Education and Sustainable Development (ESD) has become a central focus for education policymakers globally, leading to the establishment of various types of schools such as ESD, sustainable, nature, environmental, forest, eco, and green schools. This study specifically uses the term "Eco-School" for consistency, reflecting its common usage in Turkey. The study aims to assess the knowledge level of Eco-School principals regarding the Eco-School program and their perspectives on its implementation. Eco-Schools prioritize environmental awareness and sustainability. Therefore, it is crucial to understand the school principals of the program's content, objectives, methods, and impacts, as well as their opinions on its effectiveness and sustainability, in order to evaluate the educational policies and practices. This study intends to offer a comprehensive evaluation of the Eco-School program from the school principals' opinions. The study sample includes 21 school principals from private and public Eco-Schools affiliated with the Nilüfer, Osmangazi, and Yıldırım District Directorates of National Education in Bursa province during the 2022-2023 academic year. In the study, the researchers collected data through semi-structured interviews and analyzed them through the content analysis method. Study findings revealed that school principals believe Eco-School effectively promotes sustainability, integrating environmental awareness into education, thereby enhancing ecological knowledge. They recognize the significant potential of Eco-School programs in environmental education and express general satisfaction with their implementation. However, they also identify some challenges, such as time limits and coordination issues that need to be addressed to enhance the program's effectiveness. Overall, the study highlights the importance of Eco-School programs in fostering environmental consciousness and the need for strategic improvements to optimize their impact.

Keywords: Eco-School, environmental education, nature school, school principals' opinions

Cite: Ay, S., Atasoy, E. & Güleç, S. (2025). Evaluation of Eco-School Programs from the Perspective of School Principals: The Case of Bursa Province. *Anadolu Journal of Educational Sciences International, 15*(2), 655-678. https://doi.org/10.18039/ajesi.1527069

[1] This article is derived from the first author's master's thesis and has been prepared with the academic contributions of the thesis advisors, who are the second and third authors.

[2] Specialist Teacher, Bursa Uludağ University, Institute of Educational Sciences, Social Studies Education, Türkiye, sedanuray@uludag.edu.tr, https://orcid.org/0009-0001- 0051-8112

[3] Prof. Dr., Bursa Uludağ University, Faculty of Education, Turkish and Social Sciences Education, Türkiye, eatasoy@uludag.edu.tr, https://orcid.org/0000-0002-1473-7420

[4] Assoc. Prof. Dr., Bursa Uludağ University, Faculty of Education, Turkish and Social Sciences Education, Türkiye, sgulec@uludag.edu.tr, https://orcid.org/0000-0002-8961-3975

[5] This research study was conducted with Research Ethics Committee approval of Bursa Uludağ University, dated 25.11.2022 and issue number 25.

Introduction

Humans are a unique species that need a clean and healthy environment to survive. However, human communities can also degrade and destroy their natural environment, destroying and polluting ecosystems. Due to their careless and unplanned actions, human societies threaten the happy life of future generations. In this context, it is undeniable that environmental problems have reached alarming proportions on local, national, and global scales. The seriousness of the situation necessitates urgent and effective actions to reduce the negative impacts of human activities on the natural environment.

Our planet's climate is changing rapidly, as documented in global scientific reports and scientists' warnings (IPCC, 2021; Ripple et al., 2019), and evidenced by erratic climate patterns and severe weather emergencies (NASA, 2021). Rising global temperatures, deforestation, and biodiversity loss have intensified environmental crises, leading to unprecedented ecological and social consequences (Steffen et al., 2018). Today, climate-related natural disasters such as hurricanes, wildfires, and floods are increasing in frequency and severity, directly impacting millions of lives worldwide (United Nations, 2022). Humans deplete the world's limited natural resources faster than they can be renewed and global warming is disrupting ecological balance and biodiversity. Today, this struggle for human control over nature, intensified by scientific and technological developments, has become an important driver of the daunting environmental problems facing society. The multidimensional ecological challenges to sustainability arise from various human activities resulting in damage to environmental values. Likewise, environmental degradation is the result of the pollution of air, water, and soil- the building blocks of nature- along with the misuse and overexploitation of natural resources (Güler and Çobanoğlu, 1997). In the broadest sense, environmental problems are the imbalances in living organisms due to the disturbances caused by toxic or polluting substances (gas, liquid, or solid) released into the soil, water, or air, and vibration (noise) caused by various forms of energy radiation and natural events (Erden, 1990).

Damage to environmental values includes the loss of factors such as the disappearance of plant and animal communities due to overconsumption and changes in their habitats, and the deliberate and reckless sacrifice of the elements that make up the environment. These are indicators of the loss of all environmental values, from cultural heritage to everyday interests. Consequently, ecological problems make their weight felt by societies (Keleş and Hamamcı, 1998). Thus, İnam (1999) draws attention to social pollution and the internal environment, stating that as long as there are problems in our internal environment, which forms our world of emotion and thought, we cannot establish friendship with our external environment and that the environmental problem is a life-culture problem (İnam, 1999). Briefly, conscience blindness towards the environment at the level of social unconsciousness is effective in the pollution of our internal and external environment. Moreover, various factors such as time, place, and cultural differences also affect the understanding of environmental issues. Therefore, societies approach environmental issues differently based on their scientific, ethical, economic, and cultural norms and values, leading to perceptions of environmental threats at various levels. However, a frequently overlooked crucial fact is that the global ecological crisis transcends national borders, races, religions, and societies and affects the entire planet as a unified system (Atasoy, 2005).

The rapid increase in the world population has led to the unnecessary and unconscious use of natural resources, resulting in environmental problems such as industrialization, urbanization, and desensitization. Consequently, numerous studies have recently emphasized

the significance of international cooperation and sustainable environmental policies (Uludağ et al., 2017). For instance, research by Rockström et al. (2021) highlights the planetary boundaries framework, underlining the necessity for urgent global action to mitigate environmental degradation. Similarly, Sachs et al. (2022) emphasize the role of sustainable development goals (SDGs) in addressing climate change, biodiversity loss, and pollution globally. Furthermore, various international initiatives promote ecological awareness and actions. For instance, the Eco-Schools initiative, for example, has effectively integrated sustainability teaching into school curricula in many nations, including Finland, Denmark, and Japan. Germany's Energiewende policy serves as an example of transitioning to renewable energy sources and reducing carbon emissions (Müller & Schreurs, 2020). Countries like the Netherlands have implemented large-scale climate adaptation projects, such as "Room for the River," to mitigate flood risks, while urban centers like Singapore have pioneered sustainable water management solutions through advanced recycling technologies (Wong, 2020).

Additionally, understanding and adopting the concept of "Eco-School" in the context of ecologically based education is vital, as it holds the potential to increase environmental protection awareness and solve ecological problems, a responsibility that falls upon all of humanity. The Eco-School program, implemented in over 101 countries, has proven to be an effective initiative in fostering environmental consciousness among students. In Norway, eco-schools integrate outdoor learning and renewable energy projects into their curriculum, while in China, the government promotes environmental education through school-based green initiatives (Foundation for Environmental Education, 2024). Moreover, the effectiveness of these programs is closely linked to school principals' levels of knowledge and attitudes, highlighting the need for leadership-oriented sustainability training for educators. Today, there is an increase in the importance of combating environmental problems and adopting sustainability principles. In this context, educational institutions must actively participate in environmental awareness and sustainability. Eco-School programs are an essential initiative and many countries have already implemented and adapted them on a global scale. School Programs are offered via schools that incorporate different activities and projects into the schools to educate students about environmental awareness and sustainable principles and how to implement them in their own lives. This includes projects on waste management, energy efficiency, water conservation, and environmental protection. However, another factor affecting the efficacy and durability of Eco-school programs is the school principals' level of knowledge and attitudes.

Purpose and Significance of the Study

The current study aims to investigate the awareness level of the principals about Eco-School programs and, therefore, to make a profound assessment of what they think and feel about implementing this program. Since Eco-Schools generally base their activities around environmental literacy and sustainability, it appears logical to investigate to what extent Eco-School programs effectively communicate these principles to students. Hence, the effectiveness and sustainability of the Eco-School program rely on the level of knowledge of Eco-School principals in the content, goals, methods, and impacts of the program. Furthermore, Eco-School programs are not isolated but are closely linked to broader environmental education policies nationally and internationally. Many countries incorporate Eco-Schools as part of their sustainability strategies, aligning them with frameworks such as UNESCO’s Education for Sustainable Development (ESD) goals and the UN Sustainable Development Goals (SDGs) (UNESCO, 2020).

Additionally, Eco-School initiatives often complement national curricula by integrating environmental awareness into subjects like science, geography, and social studies, fostering a multidisciplinary approach to ecological education. Thus, evaluating Eco-School programs requires considering their role within the larger context of environmental education policies and their potential impact on shaping future generations' ecological consciousness.

Problem Situation

The main problem of this research is to evaluate the contributions of the Eco-School program to administrators, teachers, and other school staff by analyzing its educational impacts compared to traditional schools, the challenges encountered in its implementation, and proposed solutions to these challenges. In this context, the research problem is to assess how educational policies and practices are perceived concerning the Eco-School program from the perspective of school administrators and to evaluate the feasibility and effectiveness of implementing this program in schools.

In line with the purpose and main problem of the study, the researchers have investigated the following sub-problems:

(1) What are the school principals' knowledge level and opinions about conducting an Eco-School program within the scope of a nature school?

(2) What is the impact of the education in a nature school implementing the Eco-School program compared to traditional schools?

(3) What are the problems encountered while conducting the Eco-School program and what are the solutions to these problems?

(4) What is the satisfaction level of the school principals with the Eco-School program?

(5) What are the impacts of the Eco-School program on school principals, teachers, and other staff?

Method

Research Design

Today, this study aims to examine the pedagogical impact of the Eco-School program, with the opinions of principals and vice-principals in Eco-Schools. Hence, the study adopts a qualitative research design, a "case study" approach, to understand and interpret the school principals' experiences and opinions. Creswell (2007) states that a case study is a qualitative research approach in which the researcher examines a limited number of situations in depth, using data collection tools from multiple sources (Creswell, 2007). This research identifies situations and situational themes, using data from various sources such as observations, interviews, audiovisual materials, and documents. It aims to understand and explain a phenomenon or event comprehensively. Case studies systematically collect data about a specific situation or event, helping to understand why the event occurred as it did and identifying areas for future research (Davey, 1991). This research, like Davey's view, aims to deeply analyze specific cases of Eco-School principals' experiences to explore how these cases reflect broader issues related to environmental education and sustainable school practices.

Universe and Sample / Study Group / Participants *(Use the relevant ones)*

In the study, the researchers selected 21 school principals and vice-principals working in private and public institutions labelled as Eco-Schools in the Nilüfer, Osmangazi, and Yıldırım districts of Bursa province by random sampling. These districts were chosen because they have the highest number of Eco-Schools in the region. While the initial selection was based on random sampling, the final sample was refined through purposive sampling to ensure the participation of key individuals who had direct experience with the Eco-School program and its implementation**.** This method allowed for the inclusion of school principals and vice-principals who could provide rich, relevant data regarding the Eco-School program's impact on environmental education.

The decision to select participants from Nilüfer, Osmangazi, and Yıldırım districts was based on the high concentration of Eco-Schools in these areas. The idea was to capture diverse perspectives on the program’s implementation in areas where its influence could be most pronounced. The purposive sampling approach was further refined to focus specifically on principals and vice-principals who were actively involved in Eco-School activities, ensuring that the study would reflect those with firsthand experience. This sampling process ensures that the data collected is both relevant and rich in content, representing a variety of perspectives from different schools in these districts. The process of selecting participants and the choice of districts may have influenced the findings, as the districts selected had a greater presence of Eco-Schools, which may have different implementation levels and challenges compared to other districts in Bursa. As such, the results may not be directly transferable to regions with fewer or no Eco-Schools. However, this targeted sampling approach provides a deep insight into how the Eco-School program operates in areas where it has been most widely adopted.

Table 1

Descriptive Information on the Sample of Eco-School Principals and Vice-Principals Interviewed

Variables	Categories	*f*
Gender	*Female*	16
	Male	5
Mission	*School Principal*	8
	Vice-Principal	13
Education status	*License*	8
	Master's Degree	13
	PhD	0
Management Seniority	*1-5 years*	8
	6-10 years	4
	11-15 years	3
	16-20 years	4
	21 years and above	2
Management Experience at Nature Schools	*1 year*	1
	2 years	7
	3 years	2
	Other (3 years and above)	11
Type of School	*Kindergarten*	6
	Primary School	11
	Middle School	5
	High School	4
Course/Seminar, etc. on Nature and Environmental Education during the Educational Process.	*Yes*	9
	No	12

Table 1 shows the demographic information of the participants. The study sample included 21 participants. Considering the gender variable, the number of female participants was 16 and the number of male participants was 5. In terms of mission, 13 of the participants were vice-principals and 8 were school principals.

Regarding the education level of the participants, 13 of them had a master's degree, 8 had a bachelor's degree and no participant had a doctorate. It is noteworthy that none of the

participants had a doctorate. It shows that the need for doctoral education in managerial positions in nature schools has not yet become widespread.

As for management seniority, 8 participants had been working as school principals or vice-principals for 1-5 years, 4 participants for 6-10 years, 3 participants for 11-15 years, 4 participants for 16-20 years, and 2 participants for 21 years or more. In terms of management experience in nature schools, 11 participants had 3 years or more experience, 7 participants had 2 years, 2 participants had 3 years and 1 participant had 1 year of experience.

Concerning the type of school where the participants worked, 11 participants worked in primary school, 6 in kindergarten, 5 in middle school, and 4 in high school. While the number of participants who received training on nature and environmental education was 9, the number of participants who did not receive training was 12.

Based on these data, the majority of the participants were women and vice-principals, who had master's degrees, and varied management seniority. Additionally, the majority of the participants did not receive any nature and environmental education to serve as principals or vice-principals in nature schools.

Table 2

Descriptive Information on Training Received on Nature and Environmental Education

Environmental Education Relationship Level	**Categories**	***f***
Active participation	*Eco Energy design seminar*	1
	Eco-School coordinator training	5
	Zero waste training	1
	Forest school training	1
	Nature and forest pedagogy trainer training	2
	Responsible production and training	1

Table 2 shows the training received by the participants on environmental education and the relationship levels of this training. According to the table, 9 participants received one or more of these trainings. Considering the training received within the scope of environmental education; 5 participants received Eco-School Coordinator Training and 2 participants Nature and Forest Pedagogy Trainer Training. One participant each received an Energy Design Seminar, Responsible Production-Consumption Training, Zero Waste Training, and Forest School Training. Accordingly, the participants preferred different types of training based on their areas of interest related to environmental education.

Hence, the study determined that a small number of participants received training in environmental education compared to the majority. Additionally, 9 participants received training in different fields and actively participated in these fields. It shows that the participants, albeit a small number, made efforts to increase their awareness of environmental and nature education and to specialize in these areas. In addition, the participation level was high in Eco-School coordinator training compared to other training programs. Other training programs had lower levels of participation. Based on this table, it is possible to interpret that almost half of

the participants had different interests in environmental education and had participated in various trainings in this field.

Data Collection Tools

This study used a semi-structured principal interview form consisting of 5 open-ended questions, developed by the researchers to collect school principals' and vice-principals' opinions. The principal interview form focused on the pedagogical importance of Eco-Schools and measured principals' experiences, perceptions, and opinions. The interview form consisted of questions designed by the researchers and structured within the purpose of the research.

During the research process, the researchers presented interview questions to two field experts, a social studies education specialist and an environmental education specialist. Considering the experts' opinions, the researchers made suggested changes and corrections. In the editing phase, the researchers corrected some expressions that could cause confusion and removed some questions that did not address the sub-problems from the form. In addition, the researchers conducted interviews with each school principal or vice-principal to test the comprehensibility of the interview questions. The interviews also indicated that the questions were free from any misconceptions. Feedback and edits reinforced that the interview questions were transparent and understandable and served their purpose.

Data Collection Process

The study has been applied in the data collection and a semi-structured interview technique was employed. A semi-structured interview is a specific way of conducting an interview with some basic questions by the researcher, but it is a conversation opening themes to discuss (Yıldırım & Şimşek, 2013). This approach ensured the relevant data to address the research questions. These interviews were recorded one-on-one with 11 Eco-Schools principals or vice-principals through the researcher. The interviews were conducted based on the principal questions interview form. Questions in the form were mainly related to the Eco-School program's pedagogical impacts, environmental knowledge and attitudes, program implementation, and participants' experiences. The researchers made sure that the participants of the Eco-School program had the opportunity to tell the researchers and the evaluators what they noticed about the program. The researchers also taped and transcribed the interviews, to reproduce participants' words and experiences as accurately as possible. The researcher did this to make the phase of collecting data as reliable as possible.

Reporting and Data Coding: To make the results and discussions more understandable the authors coded each participant during reporting as "Principal 1 (P1), Principal 2 (P2), Principal 3 (P3)...". Researchers used this code in the anonymization of the participants to reduce the readability of the data. The coding process allowed the data to be analyzed while keeping the real identities of the participants hidden, thus securing the opinions of the participants. During the reporting of the data, each of the transcripts was read through carefully, and relevant themes were identified for analysis. This phase of analysis utilized a content analysis approach and facilitated the devising and interpreting of categories from the data.

Data Analysis

The data that was collected in the current study was analyzed by using the Content Analysis method. Content analysis is a method of analysis that is aimed at searching and comparing key principals' opinions to define their themes and patterns (Yıldırım & Şimşek,

2013). The interview data were digitized, checked, and analyzed by the researchers in cooperation with the experts. Then, depending on each other, they divided and arranged all the data that they found in their topic into tables.

Validity and Reliability / Trustworthiness *(Use the relevant ones)*

The research included the following steps to ensure the validity and reliability:

- Content Validity: The researchers explained that they have defined the study scope with references to the literature review and expert opinions in the current study. In addition, the researchers have mapped the research design following an approach to examine the perception of the principals to assess the teaching relevance of the Eco-School program, depending on the scope of the subject.
- Validity of Analysis: It also includes a content analysis method which allows giving an objective on the collected data. In a critical assessment process, the data are reviewed to check whether there is a compatibility issue between the researcher and the experts. Therefore, the researcher, the social studies education specialist, and the environmental education specialist modified the codes and variables to establish categories. After that, they included a comparison between the perceived categories by the two parties involved. To compare the categories identified by the researcher and two experts, this stage used the reliability formula of Miles and Huberman (1994) that states “Reliability = Consensus / (Consensus + Disagreement) x 100” to determine consensus and disagreement among the participants and therefore assess reliability. This formula sought to assess the inter-observer reliability or the actual or approximate extent of agreement between two participants or coders. The percentage of interrater reliability came to 95% by using the formula, which said that 95% was acceptable for the validity and reliability of the agreement between the coders. However, the aspect of validity and reliability was found to have improved when the researcher applied direct quotes and descriptive definitions. The result was very important for assessing the reliability of the study.

Ethical Issues

In this study, the principles of research ethics were observed and the necessary ethics committee permissions were obtained. Within the scope of ethics committee permission; Bursa Uludağ University Social and Human Sciences Research and Publication Ethics Committee, November 25, 2022, 2022-10 numbered document was obtained.

Findings

The study examined the results of the interviews with the school principals to evaluate the effectiveness of Eco-School programs. The study aimed to analyze the school principals’ knowledge level of Eco-School programs and opinions on implementing the program. In this context, the researchers meticulously categorized and organized the findings from the interviews with the principals in tables. The findings section presents the school principals’ experiences and opinions about the Eco-School program. The study findings will make an important contribution to understanding the potential of Eco-School programs and developing effective strategies in environmental education.

Findings on Eco-School Principals' Knowledge Level of Eco-School Program and Their Opinions about it

The researchers asked the question "What are the school principals' knowledge level and opinions about conducting an Eco-School program within the scope of nature school?" in the semi-structured interview form to the school principals and vice-principals to determine the findings related to the main problem of the study, "Eco-School Principals' Knowledge Level of Eco-School Program and Their opinions about it". Thus, Table 3 and Table 4 present the findings from the analysis of the answers from the school principals and vice-principals to the question:

Table 3

School Principals' and Vice-Principals' Opinions on the Purpose of Eco-School Program

Theme	Code	Subcode	*f*	%
Environment	Environmental awareness and consciousness	*Children with environmental awareness*	6	29
		Recycling awareness	4	19
		Fostering a love for nature	3	14
		Awareness of energy and water conservation	2	9
Sustainability	Education for sustainable development	*Awareness of renewable energy*	3	14
		Responsible consumption	2	9
Protection	Protection of natural and cultural assets	*Protection of natural and historical sites*	1	5
		Total	21	100

The data in Table 3 reflect the school principals' and vice-principals' opinions about the purpose of the Eco-School program. Within the scope of the research, the researchers evaluated answers from 21 principals regarding the purpose of the Eco-School program. Accordingly, 15 principals (71%) stated that they saw "raising *environmental awareness and consciousness"* as an important purpose of the program, and some of their opinions are as follows:

P4: "All our children have the awareness of a nature-friendly school. In addition to providing schools with a guiding program on environmental education, the Eco-Schools Project is also an award scheme, as it awards the Green Flag to schools that have achieved outstanding success in their work and environmental education within the project. The Green Flag is an internationally recognized and respected eco-label that symbolizes an environmentally conscious school. The implementation of the project provides students with habits that they will use throughout their lives and will affect their success and environment."

P9: "The Eco-School program aims to contribute to raising nature-friendly generations, placing activities aimed at raising environmental awareness in school education and training processes."

P11: "This project in our school aims to raise children with environmental awareness. Every year we implement it and we can draw attention to natural problems within the framework of our subject. We ensure the participation of each course by getting the support of all the classes. It is a project in which both teachers and students contribute and benefit commonly."

However, 24% of the principals emphasized the purpose of *"Education for sustainable development"* and 5% emphasized the purpose of *"Protection of natural and cultural assets"*. These results show that the school principals and vice-principals evaluated the Eco-School program as a program aimed at developing environmental awareness and consciousness. Participants expressed fewer opinions on sustainable development education and the protection of natural and cultural assets.

Table 4 presents the *"School Principals' and Vice-Principals' opinions on the Contribution of Eco-School Programs to Environmental Education*". The table includes the Eco-School principals' and vice principals' opinions, evaluating the contribution and impact of the Eco-School program on environmental education. Under this question, the researchers considered 21 school principals' and vice-principals' opinions.

Table 4

School Principals' and Vice Principals' Opinions on the Contribution of Eco-School Programs to Environmental Education

Theme	**Code**	***f***	**%**
Individual awareness	*Raising environmental awareness in students*	5	24
Awareness in the family	*Raising environmental awareness in families*	1	5
Awareness in society	*Raising environmental awareness in society*	9	43
Habitual change	*Environmental awareness in habits*	6	28
	Toplam	21	100

According to the data in Table 4, 43% of the principals emphasized the contribution of *"raising environmental awareness in the society"*. Additionally, 28% of them emphasized the contribution of *"Environmental awareness in habits*", 24% of them emphasized *"Increased environmental awareness in students"* and 5% of them emphasized *"Raising environmental awareness in families"*.

The results in the table showed that Eco-School principals and vice-principals attached the highest importance to the Eco-School program's contribution to *"raising environmental awareness in society"*. Some of their opinions on the subject are as follows:

P9: "If all stages are applied consciously, I think it will contribute to raising conscious generations."

P10: "I think that the presence of different subject areas and our chance to experience every field in the continuity part make the program efficient. Therefore, I think that it provides an opportunity for the adults in the school to complete the parts they are missing in this process and moves them away from spontaneity."

P14: "It can contribute to teachers, students, and parents gaining different perspectives."

Considering the answers from the participants to the question "Do you find the training carried out as a nature school implementing the Eco-School program more effective compared to classical schools?" in the interview form, the following results emerged:

Table 5

School Principals' and Vice-Principals' Opinions about the Effects of Eco-School Training Compared to Classical School Training

Effect Levels of Eco-Schools	***f***	**%**
More effective	21	100
Similarly effective	0	0
Less effective	0	0
Total	21	100

Table 5 presents the school principals' and vice-principals' opinions about the impact of Eco-School training compared to classical school training. According to the data, all administrators thought that Eco-School training was *"more effective"* than classical school training.

Some of the answers from the participants who agreed that Eco-School training was more effective than classical school training are as follows:

P2: "Yes. First, the fact that it is based on projects and activities carried out together and requires solidarity enables us to work as a team and achieve a result. It is not the same as saying 'this is nature awareness' in classical lessons."

P16: "Definitely. Since it progressed in the form of a curriculum, the practices lead to the transformation of known acquisitions into habits after a while because they require the transition of known acquisitions to life."

P19: "Yes. The Eco-School program aims to provide students with habits that they will use throughout their lives and address environmental issues. From this point of view, I find the training in nature schools more effective than conventional schools in terms of students' participation in group work, developing the ability to recognize problems, producing and discussing solutions, taking initiative, making plans, writing reports, developing decision-making skills, preventing wastefulness by changing consumption habits, and developing awareness of protecting natural resources."

The results obtained in line with the answers from the participants to the question "Are there any problems you encounter as an institution while implementing the Eco-School program? If so, what are your suggestions for solutions to these problems?" are as follows:

Table 6

School Principals' and Vice-Principals' Opinions about the Problems Encountered While Implementing the Eco-School Program

Frequency of Encounter	Code	*f*	%
Never	*No problem*	8	38
Sometimes	*Time problem*	5	24
	Age problem	1	5
	Coordination problem	5	24
Usually	*Budget problem*	2	10
	Total	21	100

Table 6 presents the *"School Principals' and Vice-Principals' Opinions about the Problems Encountered While Implementing the Eco-School Program*". The table shows the problems encountered by the school principals and vice-principals during the implementation of the Eco-School program and the frequency of these problems. According to the data obtained from Table 6, 8 (38%) participants stated that they did not encounter any problems, which took place in the *"No problem"* category. Within the *"Time problem"* category, 5 (24%) participants stated that they sometimes encountered time problems. Additionally, in the "*Age problem*" category, 1 (5%) participant stated that s/he sometimes encountered age problems, and in the "*Coordination problem*" category, 5 (24%) participants stated that they sometimes encountered coordination problems. Besides, in the "*Budget problem*" category, 2 (10%) participants stated that they usually encountered financial problems.

Some of the participants' opinions about time problems while implementing the Eco-School program are as follows:

P1: "In addition to intensive training programs, some activities cannot be carried out as planned. Sometimes the date or the content of the event changes. Sometimes the event has to be cancelled."

P11: It is difficult for us teachers to come together and create the action plan in terms of time. In addition, we have difficulty finding enough time to meet with the student group within the framework of the action plan. As a solution suggestion, before the coordinator teachers prepare the action plan, branch teachers should submit their activity suggestions in written form. Meetings with students can be helpful outside school hours or class hours can be arranged by this. Breaks are not enough."

The participants' opinions about the problem related to the student's age while implementing the Eco-School program are as follows:

P4: "We regret that we cannot realize some school trips because our students are too young (For example, recycling factories, water treatment factories, dam excursions, etc.)."

Some of the opinions of the participants about coordination problems while implementing the Eco-School program are as follows:

P7: "It is necessary to encourage students in the project area. They may be hesitant and not assertive when they start working in a field. As the process progresses and they start to bring products and see each other, their motivation increases and they make more effort."

P19: "I think that the most important and integrative factor in the Eco-Schools program is student participation. As an institution, we may sometimes have trouble ensuring student participation and motivation. In these cases, we try to increase participation by adopting incentive methods and modelling them personally."

P21: "When we were implementing the Eco-Schools program in the first years, our teachers and parents were very insensitive. I observe that our parents and teachers are more sensitive today compared to the past years."

The opinions of the participants who generally experienced budget problems while implementing the Eco-School program are as follows:

P6: "For the program to be implemented, first of all, the management staff should not get caught up in the wage issue."

P8: "Financial difficulties encountered in the activities. Support can be received from social institutions in this regard."

Considering the answers from the participants to the question "In general, can you state your opinions about whether you are satisfied with implementing the nature school program in education with the reasons?" in the interview form, the following results emerged.

Table 7

School Principals' and Vice-Principals' Satisfaction Levels with Implementing Eco-School Program

School Principals' and Vice Principals' Satisfaction Levels	***f***	**%**
Satisfied	20	95
Dissatisfied	0	0
Uncertain	1	5
Total	21	100

Table 7 presents school principals' and vice-principals' satisfaction levels with the Eco-School Program. While 20 out of 21 administrators (95%) stated that they were satisfied, no participants were not satisfied. Only 1 (5%) participant gave an uncertain answer. However, it may be necessary to conduct a more detailed analysis as to why the participant who gave an ambiguous answer was dissatisfied or gave an ambiguous answer.

These results show that school principals and vice-principals generally evaluated the Eco-School Program positively. Some of the satisfaction opinions about the subject are as follows:

P1: "They can observe the good results of working together. They get the desire to belong to a group. Their logic and reasoning skills improve. In general, we are satisfied for the reasons I mentioned."

P13: "We are satisfied because we expand the vision of our students. They realize that the world does not only belong to us."

P20: "We are very pleased to enable our children to process in detail the awareness they need to have for the sustainability of the future and the functioning of the world. Especially in the preschool period, I think it is important to give some achievements since it is the period when knowledge is the most permanent in children."

Nevertheless, a participant who did not want to state whether he/she was satisfied with the Eco-School program in his/her institution:

P6: "I do not want to express an opinion on this issue."

The reasons for the ambiguous answer may include factors such as the lack of knowledge about some aspects of the program, difficulties encountered during the implementation, or failure to meet expectations. Identifying these reasons is important for developing the Eco-School program and transferring it to school principals and vice-principals more effectively. In addition, the fact that there were no dissatisfied principals indicated that the program was generally successful. It showed that the participants adopted the Eco-School program positively and supported it.

Table 8 and Table 9 present the results from the answers given by the participants to the question "Do you think that the Eco-School program implemented in your institution as a nature school contributes to you as school principals, vice-principals, teachers, and other staff?" in the interview form are as follows:

Table 8

School Principals' and Vice-Principals' Opinions about the Contribution of Eco-Schools to School Principals, Vice-Principals, Teachers, and Other Staff

Contribution of Eco-Schools	***f***	**%**
Contribute	19	90
Partially contribute	2	10
Do not contribute	0	0
	21	100

According to the data in Table 8, the number of participants who thought that the Eco-School program contributed to school principals, vice-principals, teachers, and other staff was 19, which corresponded to 90% of the total number of participants. The number of participants who thought that the Eco-School program had partially contributed to school principals, vice-principals, teachers, and other staff was only 2, corresponding to only 10% of the total participants. In addition, there were no participants who thought that the Eco-School program does not contribute at all to school principals, vice-principals, teachers, and other staff.

In conclusion, the data in the table shows that the majority of the participants (90%) evaluated the Eco-School program positively and believed that the program contributed to these stakeholders. Some of the opinions of the principals who thought that it contributed are as follows:

P7: "It has been observed that it has contributed to all other staff, except students. Especially in projects related to sustainability, the importance of recycling has increased, setting a goal and working towards this goal has created an environmental social awareness."

P16: "It has a contribution. Because with different activities belonging to each branch, it enables other branches to implement interdisciplinary plans, and both develop the teacher and raise environmental awareness among other staff."

On the other hand, a few participants thought that Eco-School partially contributed, and they commented positively. Thus, no participants expressed negative opinions. The opinions of the principals who thought that Eco-Schools partially contributed to school principals, vice-principals, teachers, and other staff are as follows:

P11: "We think partially. In the past years, within the scope of the project, every class did a cleanup every morning with our coordinator teachers to draw attention to the garbage in our school. That year, there was very little garbage or recycling materials thrown around. Therefore, it attracted the attention of other staff and each class teacher. We once again realized the importance of acting with children."

P12: "Yes, as much as possible. We pay attention to the consumption and production processes within the school and continue to produce less waste, eat clean, and continue awareness-raising activities."

Table 9

Contributions of Eco-Schools to School Principals, Vice-Principals, Teachers, and Other Staff

Theme	**Code**	***f***	**%**
Contributions of Eco-Schools	*Raising environmental awareness*	4	19
	Sustainability awareness	3	14
	Waste management and recycling	4	19
	Conservation of natural resources	1	5
	Developing Eco-School culture	9	43
	Total	21	100

Considering the contributions of Eco-Schools to school principals, vice-principals, teachers, and other staff in Table 9, "Developing Eco-School culture" was the most frequently mentioned issue by 9 people. With this contribution, which focuses on integrating environmental and sustainability values into school culture, school principals, vice-principals, and other staff carried the sustainability awareness of Eco-School culture into daily school life. Some of the opinions of the school principals and vice-principals about this issue are as follows:

P2: "Yes, it is obvious that it contributes. Everyone from the school cleaning staff to the founder participates in the projects."

P10: "We do not think it is right to expect children to start practising where adults are not conscious. Every year we expand the training areas we go to and can go to in order to think innovatively about what we can do."

Some of the opinions of the school principals and vice-principals who expressed it as effective in raising environmental awareness:

P14: "I think the program contributed to us. I think it contributed to gaining environmental awareness, increasing the efficiency of the course process, diversifying the activities, and increasing student participation."

P19: "Of course. The program covers all school activities for the environment. Therefore, we can say that the success of the program in the schools where it is implemented is directly related to the interest of the school administration and *teachers, especially the school principal. As educators, we strive to increase our knowledge and awareness about environmental awareness and to be role models for our students by putting this knowledge into practice."*

Some of the opinions of the school principals and vice-principals mentioning waste management and transformation are as follows:

P1: "The collaboration of all the departments contributes to creating a common consciousness and making value acquisition fun. We have observed serious improvements in waste evaluation, recycling, and paper utilization."

P4: "Yes, of course. We have a very effective program in terms of water, air, soil, hygiene, environmental pollution, recyclable waste, natural resources, climate change, green areas, environmental awareness, environmental management, and sustainable development education. As an Eco-School, we established our Eco-Team and took representatives from all classes (3, 4, 5, and 6 years old) as the project is implemented throughout the school. With the guidance of our teachers in charge of our Eco-Committee, our Eco-Team students continue their work with great enthusiasm and effort. As parents, local governments, industries, and the wider community begin to take part in the Eco-School program, "Local Agenda 21" begins to be implemented in schools. Our school has reached out to other organizations to gain knowledge and experience. We invited our environment to be sensitive to environmental issues through the work we did in our school."

Conclusion, Discussion, and Implications

This part of the study presents the findings regarding the Eco-School program's effectiveness and its impact on the knowledge and perceptions of school principals and vice-principals. The results highlight significant insights into the program's success and its implications for educational policies and practice.

Conclusion and Discussion of the Findings on Eco-School Principals' and Vice-Principals' Knowledge Levels and Opinions about Eco-School Program

The data in Tables 3 and 4 comprehensively present the "Findings on Eco-School Principals' and Vice-Principals' Knowledge Levels and Opinions about Eco-School Program". The problem statement of the study aimed to examine the knowledge levels and opinions of the school principals and vice-principals about the Eco-School program. Five questions in the semi-structured interview form helped to analyze the school principals' and vice-principals' opinions about the Eco-School program in depth. In this context, the results in Tables 3 and 4 reveal similar findings in the literature. Table 3, which focuses on "School Principals' and Vice-Principals' Opinions about the Purpose of the Eco-School Program", presents the participants' perceptions of the objectives of the program. From the study, it annexed that the school principals and vice principals of the participants postulate the elementary goal of the program to be "Environmental awareness and consciousness". It shares a similar vein with the mandates of environmental education and awareness, as is often highlighted by the literature. Geray's (1997) article "Education for the Environment,", a paper that analyzed the ideas of environmental education and education for the environment proposed some issues such as, the need, significance, aims, area, and role of education for the environment. However, the article also underlined that the most fundamental role was to raise concerns over the

environment and individuals' conscience regarding it. Apart from that, the school principals and vice-principals placed the focus on the goal of promoting the "education for sustainable development" and "guardianship of the natural and cultural heritage." This proves that the Eco-School program in addition to increasing the awareness level of students on environmental issues observed different areas of interest, including protection of the natural resource and sustainable development. For example, another article by Ünal and Dımışlı (1999) on secondary environmental education in Turkey/ and the development of environmental education under the auspices of UNESCO-UNEP gave an overview of the development of environmental education at the international level and the scientific studies made on this subject. The study also addressed issues such as "Environmental education goals", "Environmental education objectives" and "Principles of environmental education" with explanations in the Tbilisi Declaration. Also, the article generally mentioned environmental awareness and consciousness and sustainable environmental education. All these examples in the literature indicate that the main objectives of environmental education in various studies were generally in a similar direction. In this context, the results of the present study and similar studies are largely parallel. Ray et al. (2025) emphasized how Eco-School initiatives are effective in raising awareness and fostering a proactive attitude toward environmental protection among students.

Table 4 presents the school principals' and vice-principals' evaluation of the effects of the program by focusing on "School Principals' and Vice-Principals' Opinions about the Contribution of Eco-School Program to Environmental Education". The table shows that almost half of the participants gave the highest importance to the contribution to "raising environmental awareness in society". This result indicates that the goal of raising environmental awareness, which was frequently discussed in the literature, had been achieved. Likewise, the contribution of "environmental sensitivity in habits" was one of the most important contributions. These results show that the Eco-School program was effective in raising environmental awareness and sensitivity among students and society in general. Similar studies in the literature emphasized that environmental education was an important tool and that raising environmental awareness was critical for the sustainable future of society. According to Lotfi and Ibourk (2023), environmental education promotes sustainability and encourages active participation in environmental decision-making. Based on the objectives of Eco-Schools, various studies revealed that children in schools that implemented the program fulfilled their environmental responsibilities and exhibited positive behaviors in water, energy saving, and environmental cleanliness. In his study, Yüksel (2009) stated that the Eco-School program provided students with environmental awareness and raised awareness about environmental problems. Similarly, Korkmaz (2014) emphasized that Eco-School practices were effective in raising environmental awareness in children. Additionally, the students noticed the saving opportunities in the classroom and around the school and put these behaviors into practice. Within the framework of "purpose", educators stated that Eco-School programs increased environmental awareness and led to positive behavioral changes in children. It is clear that the Eco-School program has goals, especially on environmental awareness, awareness, and sustainable development, determines the ways to achieve these goals, and increases social environmental awareness. On the other hand, the participants placed less emphasis on the goal of "protecting natural and cultural assets" and it can be an important indicator that this aspect of the program should be emphasized more.

As a result, the data in Table 3 and Table 4 and the consistency of these data with the literature support the Eco-School program as an effective and successful method in the field

of environmental education. These findings make an important contribution to understanding the level of knowledge and perceptions of Eco-School principals and vice-principals about the purpose of the Eco-School program and its contribution to environmental education. The data obtained will form a valuable basis for determining strategies for the effectiveness and development of the program.

The findings from Table 5 reveal that the nature school training of the Eco-School program was more effective according to the school principals and vice-principals than the classical school training. All of the participants stated that Eco-School training was "more effective" than conventional school training. This result shows that the participants evaluated the characteristics and approach of the Eco-School program positively. According to Yüksel's (2009) study, the students of Eco-Schools and the schools with a green flag were more conscious than the students of classical schools, so Eco-Schools were more effective than classical schools. According to Aktepe (2005) and Aktepe and Girgin (2009), Eco-Schools were more effective because they were more successful in practice than classical schools. This study also found that Eco-Schools were more effective than conventional schools. There were various reasons supporting these views of the participants. The participants emphasized that Eco-School education was based on projects and that the activities and solidarity developed students' teamwork and ability to achieve results. In addition, it was effective in the educational approach that children were closer to nature and environmental issues. Moreover, Eco-School education, which contributes to the development of creative thinking skills and the ability to take responsibility, can also be useful in the future of students.

The results in Table 6 reflect the challenges encountered by school principals and vice-principals during the implementation of the Eco-School program and the various dimensions of these challenges. According to the participants' views, there were mostly no problems during the implementation of the Eco-School program. However, some school principals and vice-principals encountered time, age, coordination, and budget problems. The participants who encountered time problems stated that program activities could not be conducted as planned and content changes were sometimes necessary. In addition, there were challenges in ensuring student and teacher participation, managing the program in a disciplined manner, and ensuring that activities progressed coherently. It was also noteworthy that age groups could be an obstacle for some activities and that the coordination required by the program could sometimes cause difficulties. Opinions about the lack of coordination emphasize that this deficiency was multifaceted (P3=teacher and student-related, P7 and P19=student-related, P 9=teacher-related, P 21=teacher and parent-related). To address these issues effectively, the role of the Eco-School coordinator was important to ensure a well-organized and coherent approach. Also, some steps can be taken to overcome the resistance of some teachers and parents to motivate students through meaningful participation for more effective coordination. According to Huz's (2015) study, some parents were overly concerned about their children in out-of-school activities. Besides, Sağdıç (2013) emphasized that teachers were conscious of environmental education. Hence, the purpose of the Eco-School program was achieved largely, but the goals was not fully realized due to the lack of support from families. The main reason for this situation was the parents' lack of interest or reluctance to participate in the activities and the existence of financial inadequacies. This can be explained by finding a similar situation in this study, in which teachers experienced indifferent parents as a complaint. Some parents were ignorant of environmental issues and lacked adequate concern to accord the issues the due concern. However, set-aside funds emerged as another component that formed the budget issue of the program, where the adequacy of financial means was also reported as

inadequate. This problem indicates that it is possible to have constraints in numbers when it comes to realizing the activities in question.

These results are valuable irrespective of the object of knowing different aspects of the Eco-School program. When identifying the problems that confront educational institutions in the course of enhancing special programs like environmental education, they should be in a position to seek and develop good solutions to the challenges, as well as work out ways and means of making the special program sustainable. This also goes to show the support that the stakeholders need to give the program for it to succeed in the coming years. In conclusion, the following challenges can be noted they represent some issues that educators and principals have to overcome to take the full benefits of the Eco-School program. The ultimate success of this program rests in the ability of the key stakeholders to address the issues at hand objectively and to acquire and apply problem-solving skills that embrace the goals of the program. They are recommending that there is a need to address these problems to enhance the effectiveness of the Eco-School program.

Table 7 shows the perceptions of school principals and vice-principals regarding the Eco-School program. 95% of participants expressed satisfaction with how the program was implemented, and none of the respondents complained about dissatisfaction. However, one administrator had mixed feelings, suggesting the need for further exploration. This ambiguity may arise from a lack of awareness of certain aspects of the program, problems during implementation, or unmet expectations.

Participants also highlighted areas of satisfaction, such as the program's impact on raising awareness of social and environmental issues and promoting sustainability. Some noted that the program’s focus on environmental awareness could be beneficial for students’ future lives. In conclusion, the study shows that the Eco-School program positively influenced both school principals and vice-principals, who strongly supported it. Further evaluation and improvements in the program’s strategies could help build on these positive outcomes.

The information highlighted in Table 8 and Table 9 can be used to determine the benefits of the Eco-School program to school principals, vice-principals, teachers, and the rest of the staff. The statistical findings depicted in Table 8 indicate that over nine (90%) of the participants were convinced that the program benefited them. According to the findings of the study conducted by Altın and Altın (2020), the Eco-School program made other stakeholders of the school conscious of the importance of the environment and the program awakened the desire of people in the stakeholders to protect the environment and to work in harmony. This situation just supports the notion that everything that the group tried to accomplish with the help of the Eco-School program was positive. Further, none of the participants perceived that the program made no contribution, which shows that the program had some effect to some extent. The information presented in Table 9 focuses on the benefits that the Eco-School program has brought about to the school principals, vice-principals, teachers, and other support staff. Namely, in the case of ‘frequently mentioned’, the table demonstrates that the participants intended “developing the Eco-School culture” most often. This shows that the program not only adopted environmental and sustainability values but also integrated these values into the school culture and made it a lifestyle. Participants believed that this culture had a positive impact on students and other staff. These results indicate that the participants successfully implemented the Eco-School program and it created a positive impact.

Contribution to educational policies and practice:

The findings of the study indicate that the Eco-School program has the potential to contribute significantly to shaping educational policies, particularly those concerning environmental education and sustainability. The principal goal of raising environmental awareness and promoting sustainable development aligns with the current global focus on environmental issues and sustainability. The study suggests that integrating the Eco-School program's objectives with national education policies can support broader goals of sustainability in education. It can be achieved by encouraging the inclusion of environmental education in the national curriculum, ensuring that students are equipped with the knowledge and skills necessary for responsible environmental stewardship.

Furthermore, the positive effects of the Eco-School program on school principals, vice-principals, and other educators suggest that it can serve as a model for fostering environmental consciousness in schools. Educators can use the findings to improve the implementation of such programs, particularly by focusing on aspects like collaboration between teachers, students, and parents, which was identified as a key to the program's success. Policies that support teacher training, interdisciplinary cooperation, and continuous professional development in environmental education could enhance the effectiveness of programs like Eco-School.

To increase the effectiveness of the Eco-School program and contribute to the development of similar educational models, some suggestions are as follows:

- **Educational Materials and Content Enrichment:** Incorporating various interactive materials and content can make Eco-school training more effective.
- **Competencies of Educators:** The personnel who will implement and supervise Eco-School training should be well conversant with environmental education and information, which is always changing.
- **Implementation Monitoring and Evaluation:** There were some recommendations stated regarding the impact of the program, which included the need to assess and treat the results of the shed program constantly to determine areas of weakness and have them worked on. Further, incorporating student/past participant feedback may increase the quality of the program.
- **Time Management and Planning:** A further improvement in the way the time is managed will ensure effective planning and timeliness in the implementation of the program's activities.
- **Coordination and Communication:** The Eco-School coordinator should foster prompt communication with the various school principals and vice-principals, teachers, students, and parents. It is suggested that the program can get more of the students' daily behaviors regarding environmental protection incorporated into practice if the parents are involved.
- **Financial Support and Cooperation:** Some of the ways local governments, NGOs, and other stakeholders can contribute are through financial support of the effort.
- **Interdisciplinary Cooperation:** Each of the groups can bring new ideas into the project, and the integration of different disciplines can make the effect of the program stronger.

Recommendations for other researchers: The sample selection process may have shaped the findings because the experiences and perspectives of the selected school principals and vice principals are directly related to the implementation of the Eco-School program in these specific districts. The findings should be interpreted in this context and while they provide valuable insights, the results are not generalizable to every school setting. Future research could provide a more comprehensive understanding of the impact of the program in different contexts by including other districts with Eco-Schools.

These recommendations can be useful for future improvement and a clearer and more effective application of the Eco-School program. In this way, the positive effects of the program on students' development can increase.

Contribution Rate of the Researchers

This study is a part of the master's thesis completed by the first author. It was conducted under the supervision of the second and third authors. The second and third authors guided the entire process of the study.

Statement of Conflict of Interest

There is no conflict of interest between the authors.

References

Aktepe, S. (2005). *İlköğretim Okullarında Çevre Eğitimi (Eko-Okulların ve Diğer Okulların Karşılaştırılması* [Yayımlanmamış yüksek lisans tezi], Gazi Üniversitesi, Ankara.

Aktepe, S., ve Girgin, S. (2009). Comparison of Eco-Schools and Other Primary Schools in Terms of Environmental Education. *Elementary Education Online*, *8,* 401-414.

Altın, F. ve Altın, M. (2020). Eko-Okul Programının Öğretmen Görüşleri Doğrultusunda Değerlendirilmesi: Bir Durum Çalışması*. Temel Eğitim Dergisi*, *2* (3), 18-26.

Atasoy, E. (2005). *Çevre İçi Eğitim: İlköğretim Öğrencilerinin Çevresel Tutum ve Çevre Bilgisi Üzerine Bir Çalışma* [Yayımlanmamış doktora tezi]. Bursa Uludağ Üniversitesi, Bursa.

Creswell, J. W. (2007). Qualitative Inquiry and Research Design: Choosing Among Five Approaches (2nd ed.). Thousand Oaks, CA: Sage.

Davey, L. (2009). The Application of Case Study Evaluations. (Çev: Tuba Gökçek). Elementary Educatıon Online, 8(2), 1-3.

Erden, B. (1990). *Çağımız ve Çevre Kirliliği*, Kadıoğlu Matbaası, Ankara.

Foundation for Environmental Education. (2024). *Eco-Schools: Engaging The Next Generation In Sustainability*. https://www.ecoschools.global

Geray, C. (1997). Çevre İçin Eğitim, (Yayıma Hazırlayan: Ruşen Keleş). *İnsan Çevre Toplum*, İmge Kitabevi.

Güler, Ç ve Çobanoğlu, Z. (1997). *Toprak Kirliliği.* Çevre Sağlığı Temel Kaynaklar Dizisi No: 40.

Huz, Ç. (2015). *Eko-Okullar Etiketi Bulunan ve Eko-Okullar Etiketi Bulunmayan Anaokullarının Bahçe Özellikleri* [Yayımlanmamış yüksek lisans tezi]. Pamukkale Üniversitesi, Denizli.

İnam, A. (1999). *Dünya Gönülden Gönüle*, ODTÜ Geliştirme Vakfı Yayıncılık, METU PRESS, Ankara.

IPCC. (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. [Masson-Delmotte, V., Zhai, P., Pirani, A., Connors, S. L., Péan, C., Berger, S., Caud, N., Chen, Y., Goldfarb, L., Gomis, M. I., Huang, M., Leitzell, K., Lonnoy, E., Matthews, J. B. R., Maycock, T. K., Waterfield, T. Yelekçi, O. Yu, R., & Zhou B. (Eds.)]. Cambridge University Press.

Keleş, R., Hamamcı, C. (1998). *Çevrebilim*, İmge Kitabevi, Ankara.

Korkmaz, A. (2014). *Eko-okul Programını Uygulayan Okulöncesi Eğitim Kurumlarının Sürdürülebilir Gelişme İçin Eğitim Açısından Değerlendirilmesi* [Yayımlanmamış yüksek lisans tezi]. Hacettepe Üniversitesi, Ankara.

Lotfi, H., & Ibourk, A. (2023). Effects of School-Based Environmental Clubs: Fostering Environmental Awareness and Strengthening Eco-Citizen Behaviors Among Students. *Journal of Law and Sustainable Development, 11*(12), 1775.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Thousand Oaks, CA: Sage Publications.

Müller, F., & Schreurs, M. (2020). The Energiewende and Its Implications for Environmental Sustainability. Springer.

NASA. (2021). How Do We Know Climate Change Is Real? Retrieved From https://climate.nasa.gov/evidence/.

Ray, A., Prabhu, A. V., Champettil, M. K., Krishnan, H. P. K., Bhaskaran, S., & Bommisetti, R. K. (2025). Role of Eco-Club in Fostering Environmental Sustainability Awareness Among School Students. *Salud, Ciencia y Tecnología - Serie de Conferencias, 4*, 1403.

Ripple, W. J., Wolf, C., Newsome, T. M., Barnard, P., & Moomaw, W. R. (2019). World Scientists' Warning of a Climate Emergency. *BioScience, 70*(1), 8-12.

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., ... & Foley, J. A. (2021). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. Ecology and Society, *26*(3), 1-10.

Sachs, J. D., Schmidt-Traub, G., Mazzucato, M., Messner, D., Nakicenovic, N., & Rockström, J. (2022). Six Transformations to Achieve the Sustainable Development Goals. Nature Sustainability, *5*(2), 1-9.

Sağdıç, A. (2013). *A Closer Look Into Turkish Elementary Teachers Regarding Education for Sustainable Development* [Unpublished Master's Thesis]. ODTU, Ankara.

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. & Sorlin, S. (2018). Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences, 115*(33), 8252-8259.

Uludağ, G., Karademir, A. H. & Cingi, M. A. (2017). Okul Öncesi Öğretmen Adaylarının Sürdürülebilir Çevreye İlişkin Davranış Düzeylerinin İncelenmesi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 1* (41), 120-136.

Ünal, S., Dımışlı, E. (1999). UNESCO-UNEP Himayesinde Çevre Eğitiminin Gelişimi ve Türkiye'de Ortaöğretim Çevre Eğitimi, *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 17* (17), 142-154.

United Nations Environment Programme (UNEP). (2023). *Climate Justice and Environmental Sustainability: A Global Perspective*.

United Nations. (2022). *Global Climate Change Impacts and Adaptation Strategies*.

Wong, P. (2020). Sustainable Water Management Strategies in Singapore. *Journal of Urban Environmental Policy, 27*(4), 89-102.

Yüksel, Y. (2009). *Klasik Okullar ile Eko-Okullar ve Yeşil Bayraklı Eko-Okulların Çevre Eğitimi Açısından Karşılaştırılması*. [Yayımlanmamış yüksek lisans tezi]. Gazi Üniversitesi, Ankara.