ENVIRONMENTAL LITERACY PROGRAM'S

IMPACT AND EVALUATION REPORT

TEACHERS ACADEMY FOUNDATION

DOW®

TABLE OF CONTENTS

LIST OF CHARTS

LIST OF PICTURES

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Climate change, global environmental problems, and accompanying social issues have led people living in different countries to develop different perspectives and views on the impact of human activities on increasing environmental problems. These perspectives have helped identify the right approaches to education, food safety, climate change, and several other issues through international and intergovernmental organizations. In recent years, many attempts have been made to incorporate environmental literacy more fully into the education system. By incorporating environmental literacy into educational programs, the goal is for students to grow up in a nature-based educational environment and to continue their everyday practices in the later stages of life on the axis of this awareness. Furthermore, students being raised with this awareness will understand the importance of environmental citizenship, be able to take individual initiatives by actively addressing environmental issues, use their knowledge to educate individuals about the environment.

Teaching is one of the professions that play the most important role in presiding over and adapting to social developments and changes. Education interacts with more than one field, such as economics, law and politics, and the professional and personal development of the teacher, who is one of the most important actors in the educational system, directly affects the changes and developments in other areas of society. Along these lines, the existence of teachers with environmental literacy is crucial to make individuals more aware and activate mechanisms to enforce policies to solve environmental problems at the local and national levels.

Based on these needs and requirements, we as the Teachers Academy Foundation have developed the Environmental Literacy Education Program to enable students and even parents to collaborate through their teachers for a sustainable future and achieve holistic environmental literacy with design oriented thinking steps. Under the protocol between the Teachers Academy Foundation and the Ministry of National Education, teachers were involved in training through Ministry's management information system MEBBİS. Participants followed the educational content on the Teachers Academy Foundation's distance learning platform, eKampüs. On this platform, the data provided by each participant were collected and transmitted to MEBBİS. This way, teachers who met the criteria for completing the training became eligible to receive a certificate of attendance. During the pilot stage in the first year, 240 teachers working in Istanbul, Ankara and Izmir completed the 6-day training. A total of 5,280 students were reached by participating teachers. During the 2-month mentoring program, mentees reviewed their consumption habits with their students in their schools and classes;incorporated the steps of the transformation economy into the school climate by making assessments on the basis of the question "is it a need" or "just a passing whim"; carried out applications on waste management, recycling and upcycling, and organized various activities in order to inform other individuals about these issues. Teachers who completed the mentoring process at the end of the educational program participated in the Online Design Camp with their students.

To measure the project's social impact goals, outcomes, and outputs, a series of monitoring and evaluation activities were conducted using quantitative and qualitative research techniques together. The research tools used throughout the educational program are:

- Educational Evaluation Survey
- Teacher's Pre-test
- Teacher's Post-test
- Student's pre-test
- Student's final-test
- Focus Group Study Video Recording
- Online Design Camp Video Recording

The educational evaluation survey applied to teachers and the pre-test and post-test applications applied to both students and teachers were analyzed using statistical and spreadsheet programs such as SPSS and Excel. The computer-assisted qualitative software program MAXQDA was used in the analysis of the open-ended questions in the questionnaires, the focus group's work, and the design camp videos.

Teachers who completed the training and filled out the evaluation survey indicated that participation in the environmental literacy educational program contributed positively to both their professional and personal lives. Referring to the pre- and post-test results applied to the teachers, at the end of the educational program, the teachers emphasized that they had gained a basic understanding of the environment in terms of knowledge expansion and change of attitude. Similarly, the pre-test and post-test results applied to students show that students are able to transfer the knowledge they have acquired through their teachers to their daily life practices.

Indeed, a total of 5,360 kg of waste was recycled during the studies conducted in schools. The fact that students are engaged in recycling and upcycling activities in their schools and living spaces and are acting more consciously shows that the social impact of the project starts from the school extending towards the local.

At Teachers Academy Foundation, we value the role of teachers in educating individuals who can be environmentally literate and develop solutions to social problems caused by environmental issues in line with the Sustainable Development Goals, we are proud to be involved in a project that responds to such a critical need, and we hope that the social impact of the project will grow in the years to come.

INTRODUCTION AND CONCEPTUAL FRAMEWORK

The concept of environmental literacy, which has historically gained importance, especially since the second half of the 20th century, derives its relevance both from academic studies (Ergler, 2020) in the field and from projects carried out by international and intergovernmental organizations (Brereton, 2018). In addition, it is critical that individuals, organizations, and countries have environmental expertise in order to create a common public opinion at the micro and macro levels in international calls to action to address the environmental and related social problems that are occurring around the world. For example, the Sustainable Development Goals (SDGs), which came into force in January 2016, are a universal call to action aimed at protecting the environment and the planet, eradicating poverty, and ensuring that humanity lives in peace and prosperity (Dodds et al., 2016). These 17 interrelated Goals approach the underlying causes of social problems from a holistic perspective.

Figure 1: Sustainable Development Goals

Since implementing the Sustainable Development Goals and taking necessary action on societal issues requires the participation and support of individuals, it is important that the public be made aware of sustainability issues. In this vein, countries in both the Global South and the Global North are trying to grow and rebuild their economies by attracting new and sustainable industries to their communities. This requires a workforce that has advanced technical skills and a basic understanding of the concept of sustainability. Therefore, the way to create a workforce with these skills is to raise awareness of environmental literacy early in life.

The concept of environmental literacy encompasses the development of knowledge, attitudes, and skills necessary to make informed decisions about the relationships between natural and urban systems and social, cultural, and economic processes. In this sense, an individual with environmental literacy can do the following:

- Describe and discuss ecological and environmental systems and human influences on these systems;
- Engage in hands-on outdoor learning experiences that involve exploration, investigation, and problem solving;
- Analyzes information about the environment in which he lives and can pose new questions;
- can predict what actions might be taken to respect, protect, and sustain the health and well-being of human communities and environmental systems.

As discussed in detail in the Theory of Change section of the Environmental Literacy Education Program: Social Impact Goals of the Program, teaching practices implemented during the program aim at raising the awareness of teachers, on a personal and professional level, and children, who function as social actors just like adults, about the world they live in, making sure these skills are transferrable to daily life practices in the context of the aforecited learning outcomes.

ENVIRONMENTAL LITERACY PROGRAM THEORY OF CHANGE DESIGN

The Environmental Literacy Educational Program is basically a educational program designed to review the limited resources of the world we live in and our consumption habits, to deal with climate change, the effects of which are becoming visible, and to learn about the related concepts and realize what we can do. The program aims to empower students and even parents to work together for a sustainable future through its teachers, using project management and design-based thinking steps to achieve holistic environmental literacy. The topics covered during the program are as follows:

- Causes, Effects of Climate Change and Suggestions on how to Tackle it
- Earth's Resources and Our Consumption Habits
- Renewable Energy
- Carbon Footprint
- Air, Water, Soil, Noise and Light Pollution
- Project Management in Education
- Design Oriented Thinking
- Greenhouse Effect
- Sustainable Development Goals
- Waste Management From Linear Economy to Circular Economy
- Permaculture
- Plastic Waste and Recycling Symbols_Recyclability Potentials

The theory of change as covered in the Environmental Literacy Education Program is summarized in the table below. In this context, the program aims to enable participating teachers, and through them students and parents, to acquire a conceptual level of environmental literacy in the short term, to acquire knowledge about climate change and related environmental issues in the medium term, to make them realize what they can do individually to move from a linear economy to a circular economy, to raise people who are aware of what they can do individually to build a sustainable future in the long term, and to think consciously and in a design-oriented way about the impact of their consumption habits on the environment. From this point of view, the educational program started by providing an accurate conceptualization of words such as greenhouse effect, greenhouse gases, carbon footprint, which are frequently encountered in daily life. For example, whether greenhouse gases are harmful or the definition and scope of the carbon footprint are some of the topics covered at the beginning of the program.

In line with the social impact objectives of the educational program, the expected results of the Environmental Literacy Educational Program are: teachers, students and parents involved in the project should have a positive attitude towards the natural environment in which they live, display responsible behavior and be adequately knowledgeable to influence others regarding the environment; complete the mentoring process in order to implement and promote sustainable social initiatives within the scope of the program and finally, contribute to the recollection and recycling of 1 million tons of plastic within the scope of DOW's 2030 targets.

At the end of the project, 240 participating teachers completed the environmental literacy training. Approximately 5,280 students were reached by 240 participating teachers[1] . At the end of the project, a total of 5,360 kg of waste was sent for recycling in the schools where the participating teachers work. It is possible to divide the resources used during the project process into two, namely human and technical resources. The expert trainers coordinating the program and the part-time trainers conducting the mentoring process and their knowledge related to environmental literacy can be considered human resources, while the Teachers Academy Foundation's eKampüs distance learning platform on which the training is conducted, and the Web 2.0 tools used throughout the program can be categorized as technical resources. The following section of the report provides analyses of the monitoring and evaluation activities conducted using the quantitative and qualitative measurement tools to measure the social impact of the program within the framework of the Environmental Literacy Theory of Change.

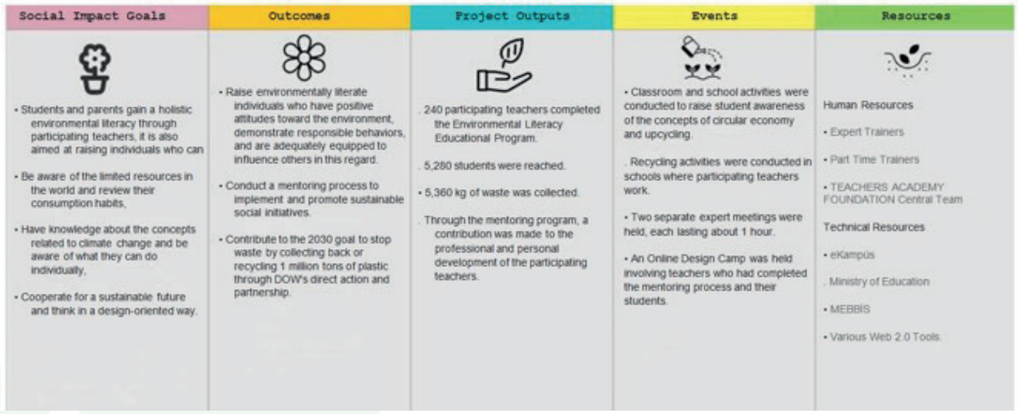


Figure 2: Environmental Literacy Program Theory of Change Design

[1]According to the National Education Statistics 2020-2021, the number of students per each classroom at the elementary level is 22.

1. ENVIRONMENTAL LITERACY EDUCATION EVALUATION RESULTS

1.1. Demographic Information

240 primary school teachers in Istanbul, Ankara and Izmir participated in and completed the Environmental Literacy Education Program. 75% of the participants are female and 25% are male teachers. The distribution of participating teachers' locations by gender is presented in the chart below.

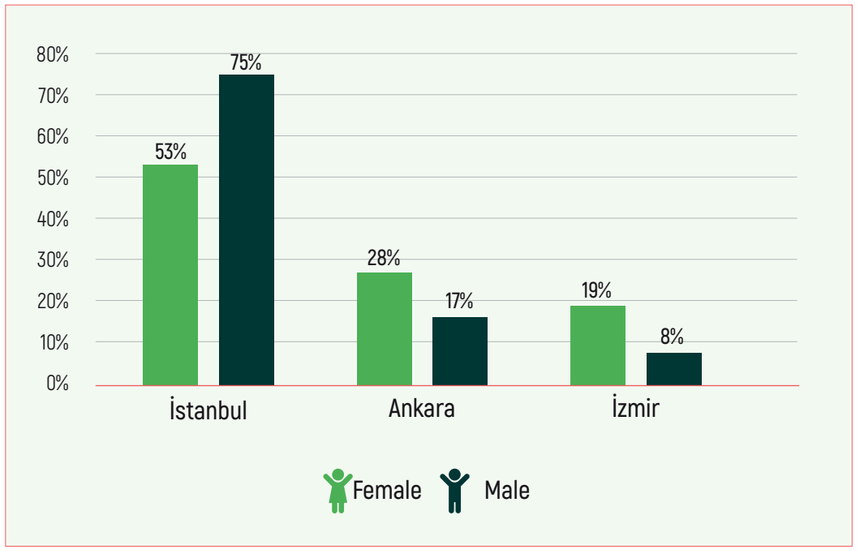


Chart 1: Distribution of Locations by Gender

As can be seen in Chart 1 above, the majority of the participating teachers are employed in Istanbul. 53% of female teachers work in Istanbul; 28% in Ankara and 19% in İzmir. While 75% of male teachers work in Istanbul; 17% in Ankara and 8% in İzmir.

1.2. Service Time of Teachers

31% of the teachers who filled out the teaching program evaluation survey had between 16 and 20 years of professional experience; 23% 25 years and above; 21% 21-25 years, 17% 11-15 years, 6% 6-10 years, and finally 2% 1-5 years of experience. The distribution of the service time of teachers who filled out the teaching program evaluation survey by the grade level they teach is shown in the following chart.

Chart 2: Distribution of the Professional Service Time according to the Class Level Taught

As can be seen in the chart above, the grade level taught by teachers with a tenure of 16-20 years is generally evenly distributed. While 45% of teachers with 25 years or more of experience are teaching 3rd grade students this year, 40% of teachers with 21-25 years of experience are teaching 1st grade students this year. The inclusion of freshly graduated and veteran teachers alike in this online program makes it clear that the training meets a real need.

1.3. News Tools

During the COVID-19 epidemic, which has had a global impact for about 2 years, teachers continued to use digital platforms to follow the news and share their thoughts. Social media tools, playing an important role in maintaining communication between colleagues despite the limiting circumstances of the epidemic, also ensured that teachers were aware of their professional and personal development. In the educational evaluation survey, participants were asked a question allowing them to circle more than one option, to find out through what means they heard about the Environmental Literacy Education Program. Descriptive data on teachers' tools/means through which they heard about the program are presented below.

News Tools	Frequency	Ratio (%)
I got an e-mail.	26	8,8
I was told about it by another colleague.	26	8,8
I was told about it by a colleague from the Teachers Academy Foundation.	25	8,4
Instagram	23	7,7
Facebook	22	7,4
Twitter	23	7,4
www.orav.org.tr	25	8,4
eKampüs	25	8,4
I take part in all courses offered by the Teachers Academy Foundation.	25	8,4
Other (please specify)	80	26
TOTAL (N)	294	100
*Number N exceeds the sample size.		

Table 1: News Tools

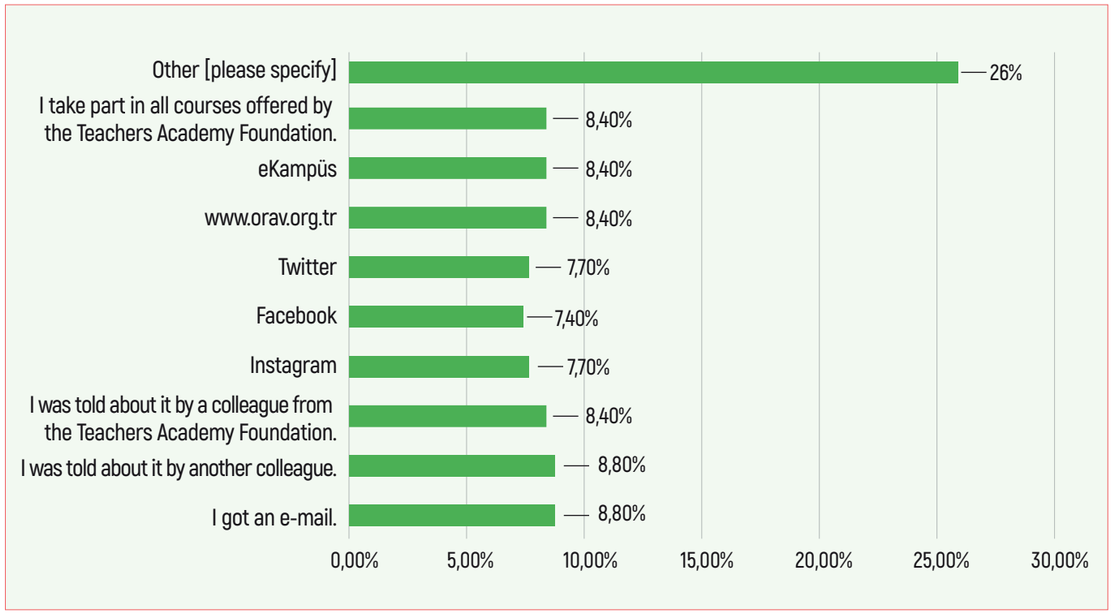


Chart 3: News Tools

Considering the data set in Table 1 and Chart 3, it was observed that most teachers circles the "Other" option when describing how they heard about the program. Looking at the responses given under the "Other" option, participating teachers indicated that they mostly became aware of the environmental education program through MEBBİS, in addition to other responses connected with the existing options.

1.4. Assessments of the Educational Structure

In the educational evaluation survey, participating teachers rated their satisfaction with training with a very high score of 9.5 out of 10. In their assessments on the structure of instruction, teachers rated instruction using a 5-point Likert question set consisting of 6 items (1 = "strongly disagree," 2 = disagree," 3 = "neither agree nor disagree," 4 = "agree," 5= strongly agree"). In general, the weighted average score for items in the scale that did not have marginal scores such as 1 and 2 was 4.49. The dataset containing teachers' ratings of educational structure is shared below.

Chart 4: Assessments of the Educational Structure

1.5. Assessments of the Educational Content

In their assessments on the content of instruction, participating teachers rated instruction using a 5-point Likert question set consisting of 10 items (1 = "strongly disagree," 2 = disagree," 3 = "neither agree nor disagree," 4 = "agree," 5= strongly agree"). The weighted average score for this 5-point Likert question was calculated as 4.7. Teachers emphasized that they would like to share the training with their colleagues, giving a score of 4.73 out of 5. At this point, the strong interest in the Environmental Literacy Education Program can be explained under two separate headings. First of all, environmental problems, both global and national, and related social problems increase the interest in studies in the field of environment and ecology. Secondly, Environmental Literacy is one of the leading topics of education teachers need to be trained about the most, as shown by research from the Teachers Academy Foundation (https://www.orav.org.tr/i/assets//pdf/degerlemeraporlari/Gelisim_Egitimleri_Tercih_arastirma_rapor_.pdf) and statistics from the regularly organized Teachers Without Borders webinar series. Therefore, it can be said that the ability of the environmental literacy educational program to address a basic social need has an impact on participants' desire to share the training with their peers. Statistical data on the content are shared below.

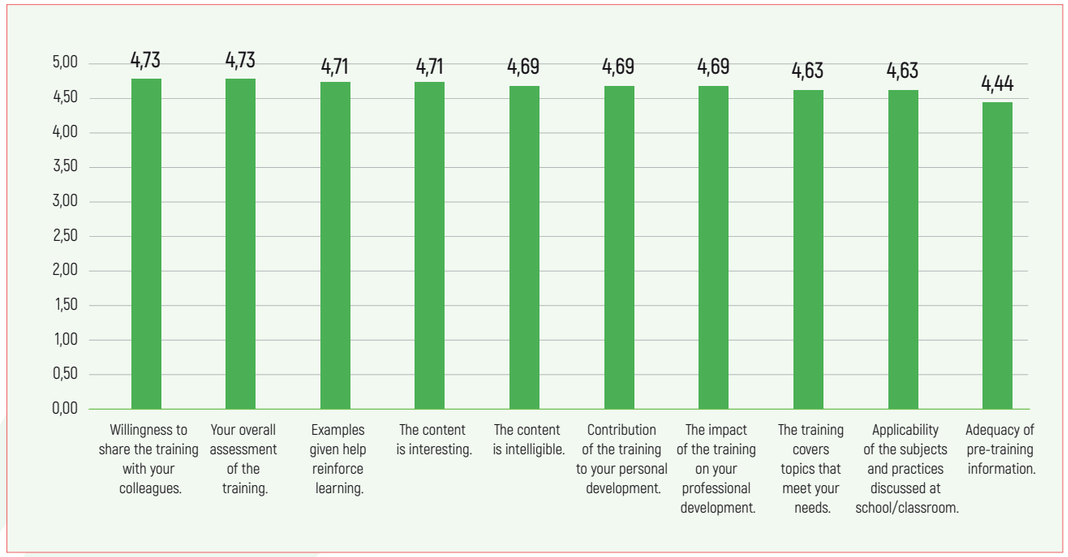


Chart 5: Feedback on the Educational Content

1.5. Evaluations of Trainers

Finally, teachers who filled out the educational evaluation survey rated trainers on a range of skill sets such as communication and presentation skills, mastery of the subject matter, and time management. The weighted average score for this 5-point Likert question consisting of 6 items was calculated as 4.8. The following chart illustrates data that includes trainer ratings from teachers. In addition, the following sections of the report discuss in detail the analyses of the focus group meetings as part of the mentoring process.

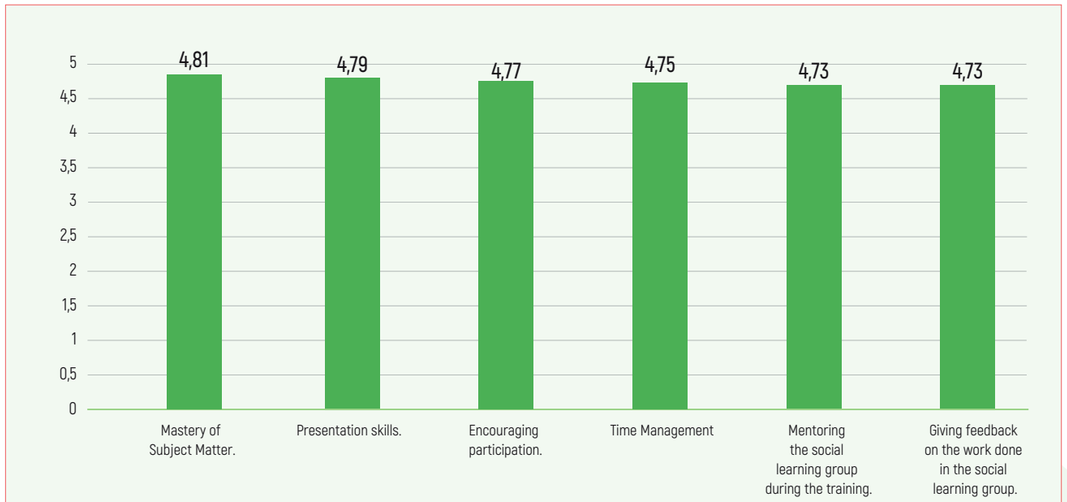


Chart 6: Evaluations of Trainers

2. IMPACT ON THE PROFESSIONAL AND PERSONAL DEVELOPMENT OF TEACHERS

As discussed in the Theory of Change section of the Environmental Literacy Education Program, the program aims to enable students and parents to acquire environmental literacy through teachers to first acquire knowledge on the subject and then apply the acquired knowledge to their daily lives and influence others around them. In this context, participating teachers were asked a 5-point Likert-type question with 15 items to measure learning outcomes, the first step of the project's social impact. The alpha reliability coefficient[2] of the educational outcome scale for environmental literacy was measured as 0.94. The charts containing the data for this scale, which statistically has a very high reliability coefficient, are shared below.

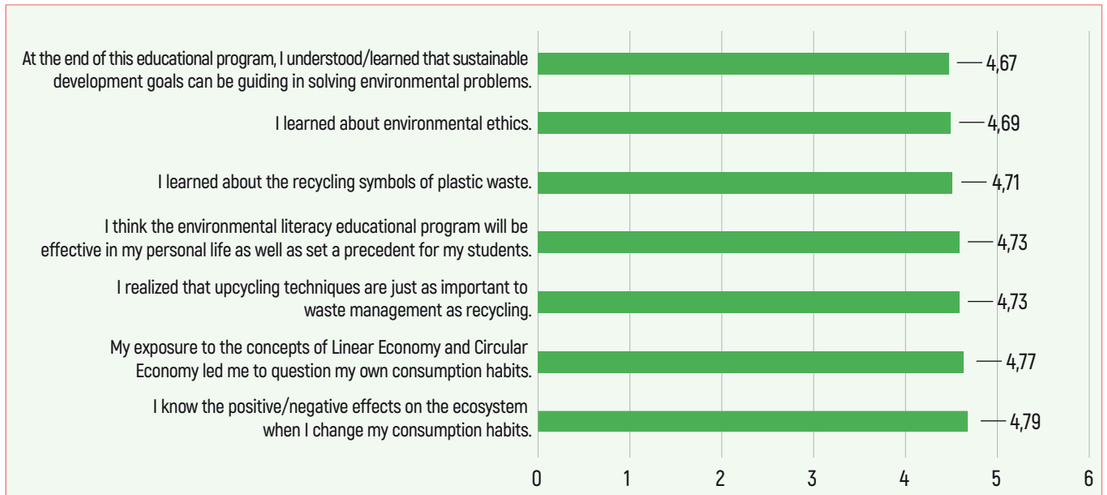


Chart 7: Learning Outcomes I

[2] A Cronbach's alpha reliability score of .70 or higher is generally considered sufficient for test result reliability.

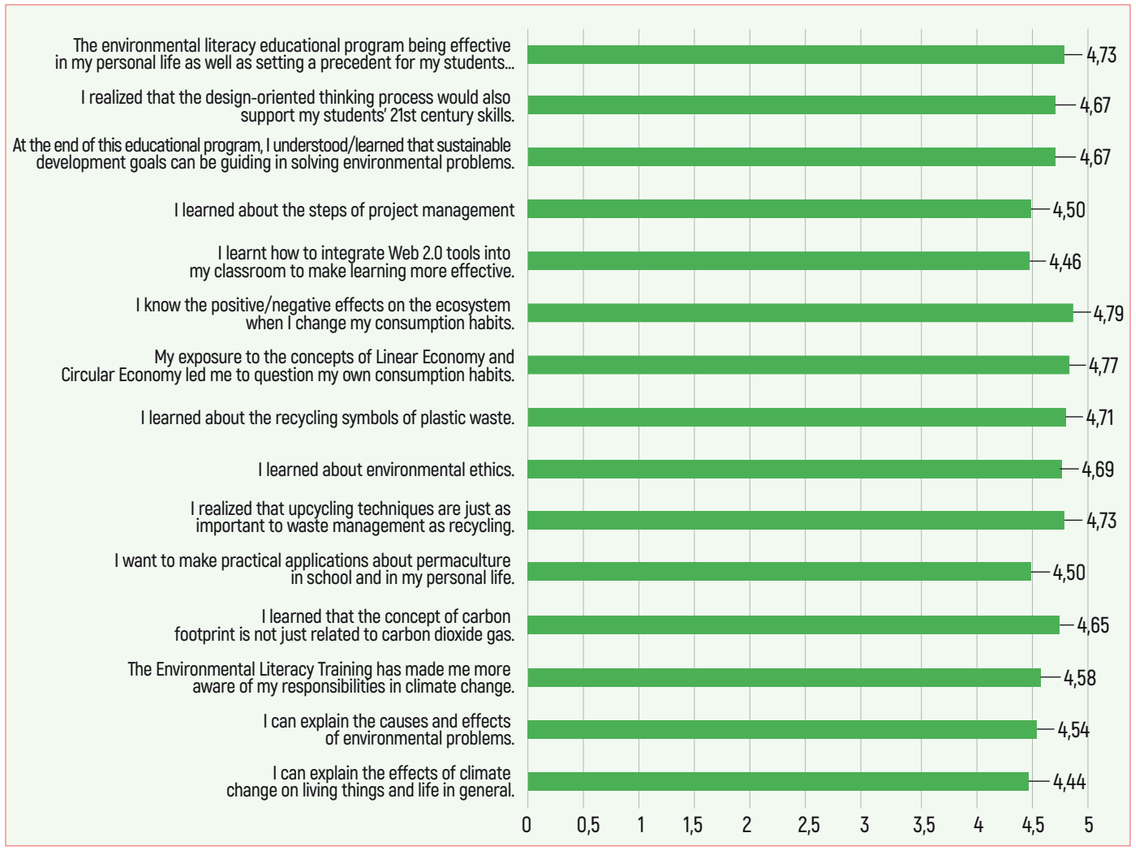


Chart 8: Learning Outcomes II

According to the data set in Chart 7 and 8 above: Teachers have developed an understanding of the impact of human activities on the natural environment at the end of the environmental literacy education program. They also gained the theoretical tools necessary to cooperatively implement design-oriented social projects to solve environmental problems in their professional and personal lives.

The educational evaluation survey asked teachers two different open-ended questions to provide more comprehensive analyses of learning outcomes and to understand the impact of the education on the teachers:

- What can this training change about you? For example, what will you do differently after this training?
- How did training contribute to your professional development?

Teachers' responses to these 2 open-ended questions were analyzed using the MAXDicto module of the MAXQDA computer-assisted qualitative software program.

As a result of these analyses, two main categories were determined around the theme "The Effect of Education on Teachers." "Influence on Professional Development and Influence on Personal Development." There is a concurrence between the effect of the educational program on teacher's professional and personal development and learning outcomes. Participating teachers who filled out the educational evaluation survey emphasized that the training had contributed significantly to their development of teaching methods that focus on environmental awareness while allowing them to adopt design-oriented thinking, teamwork, and project management in their professional lives. Similarly, the teachers emphasized that the environmental literacy educational program raised their awareness of the impact of man-made activities on the increase of environmental problems in their personal lives enabling them to examine their consumption practices in their daily lives. The comprehensive data set on the effect of education on teachers is shared in Table 2.

Theme	Category	Code	Participant Statements
The Effect of Education on Teachers	The Effect of Education on Professional Development	Design Oriented Thinking	"I learned how to produce a project and implement the project according to the stages of design-oriented thinking."
		Teamwork	"I've learned that in order to promote recycling in our country as soon as possible, theoretical education and practical application must be started in cooperation with local governments in schools without wasting time."
		Teaching Practices	"It's helped me develop an environmental awareness that we can use to enable our students to learn not only the curriculum, but also life itself." "It gave my students the opportunity to learn about and apply environmental literacy practices in school and in my daily life." "I realized I needed to incorporate more comprehensive environmental and nature awareness into my lesson plans." "I found answers to a lot of questions that I was only concerned with in my personal life which I could never figure out how they could contribute to my professional life."
	The Effect on Personal Development	Environmental Awareness	"I always thought I was an environmentally conscious person, but after this training, my awareness has become even stronger."
		Conscious Consumers	"I will use greener and renewable materials in my home, classroom and school. I hope to inspire my students and parents to think and act." "I will be mindful of the types of plastics in the products that I buy." "I learned that I still have a lot to learn about climate change that I thought I knew.
		Waste Management	"I will start separating waste in my daily life." "I will use recycled materials more often in my life."

Table 2: The Effect of Environmental Literacy Education Program on Teachers

3. OUTCOMES OF THE ENVIRONMENTAL LITERACY EDUCATION PROGRAM

According to the Environmental Literacy Education Program's theory of change: At the end of the educational program, primary beneficiaries (teachers and students) and secondary beneficiaries (parents and local community members) are expected to become aware of what they can do as individuals for a sustainable future, have positive attitudes towards the environment in which they live, demonstrate responsible behavior and be knowledgeable enough to inform others around them. A pre-test and post-test were applied before and after the project to understand if there were differences between participants' levels of awareness of environmental literacy and any attitude changes. This section provides evaluations of the results of the Environmental Literacy Education Program from the perspective of teachers and students.

3.1. Education Program Outcomes from the Perspective of Teachers

A pre-test and post-test study was applied before the project began and after the project was completed to measure the participating teachers' level of awareness of the concept of environmental literacy. There is a scale consisting of 32 items in the form of pre-test and post-test, which includes the topics covered during the training. The pre-test and post-test results applied to teachers are illustrated in 3 separate charts:

- Teachers' Level of Environmental Awareness,
- Waste Management Awareness Level and
- Circular Economy and Project Management.

The following chart compares the pre-test and post-test results on "Teachers' Level of Environmental Awareness".

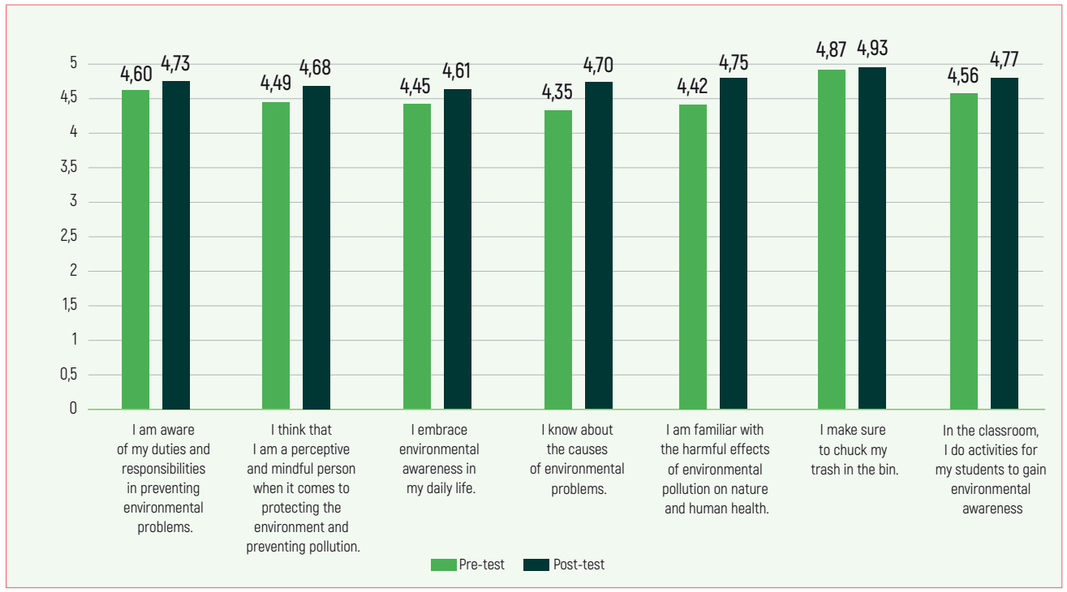


Chart 9: Participating Teachers' Environmental Awareness Level.

Looking at the pre-test and post-test results according to the chart above, there was a significant increase in baseline awareness among teachers who completed the project. For example, the item "I know about the causes of environmental problems," which was rated 4.35 out of 5 in the pre-test application, was rated 4.70 in the post-test application. Similarly, the item "I embrace environmental awareness in my daily life" increased from 4.45 to 4.61. The second aspect, which addressed training outcomes at the level of knowledge and attitude change, was "Waste Management Awareness Level" for teachers. Data for pre- and post-tests completed by teachers are given in Chart 10.

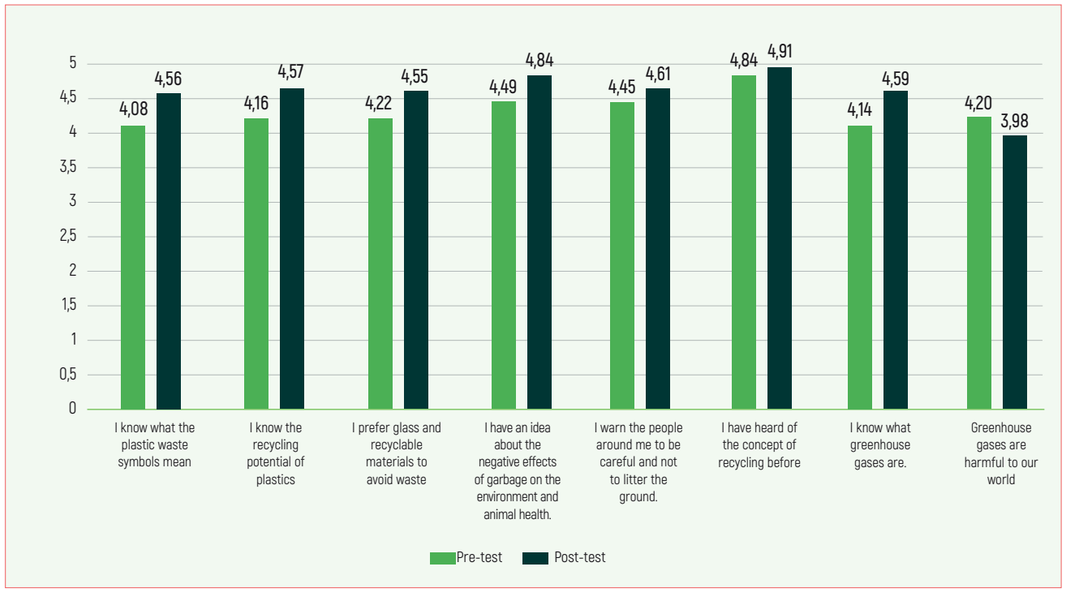


Chart 10: Waste Management Awareness Level of Teachers

There has been a noticeable increase in the awareness of teachers about waste management, which is one of the primary topics of the educational program. For example, the score for the item **"I know what the plastic waste symbols mean"** increased from **4.08** to **4.55**, while the score for the item **"I know the recycling potential of plastics"** increased from **4.16** to **4.57.**

Finally, the data in Chart 11 below includes statistics on teachers' "level of awareness of the circular economy and project management" in the context of knowledge and attitude change caused by the educational program.

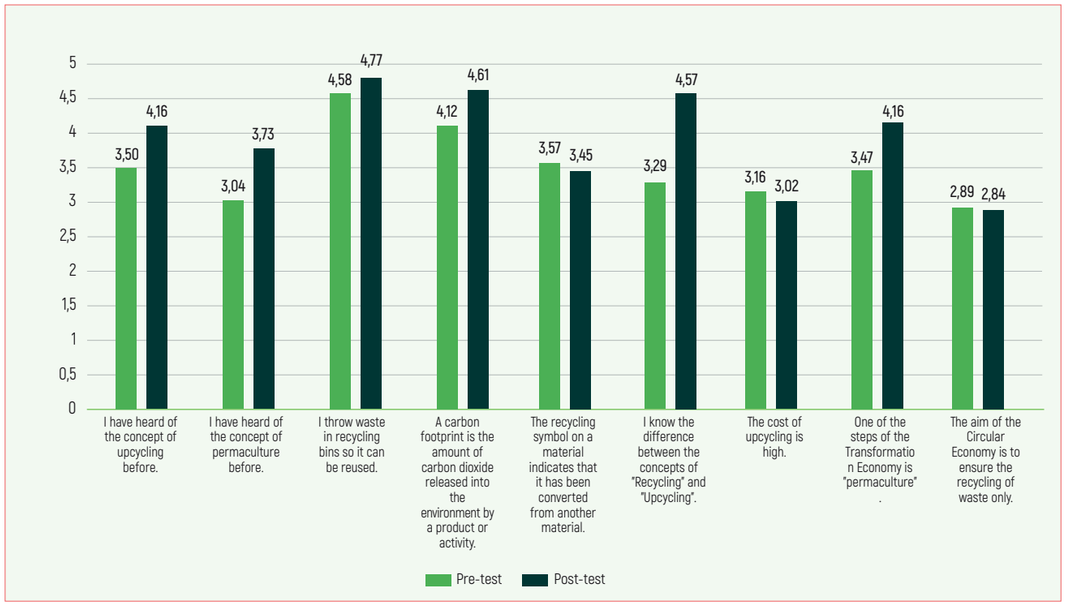


Chart 11: Circular Economy and Project Management I

The statistical data set in Chart 11 include items on the teachers' level of knowledge at the end of the environmental literacy program and the attitude changes they experienced. The **"I know the difference between the concepts of 'Recycling' and 'Upcycling'"** item in Chart 11 shows both the level of knowledge teachers have acquired and the possible attitude changes they can go through in their daily lives based on this theoretical baggage they have acquired. Therefore, it is statistically significant that participants' scores for this item increased from **3.29** to **4.57.** In addition, the fact that the control item **"The cost of upcycling is high"** has a score of **3.16** in the scale in the pre-test which decreased to **3.02** in the post-test shows that teachers have developed an understanding of the idea of upcycling.

Finally, the following Chart 12 contains the statistical data set for the evaluation of the scale points on the concept "Circular Economy and Project Management".

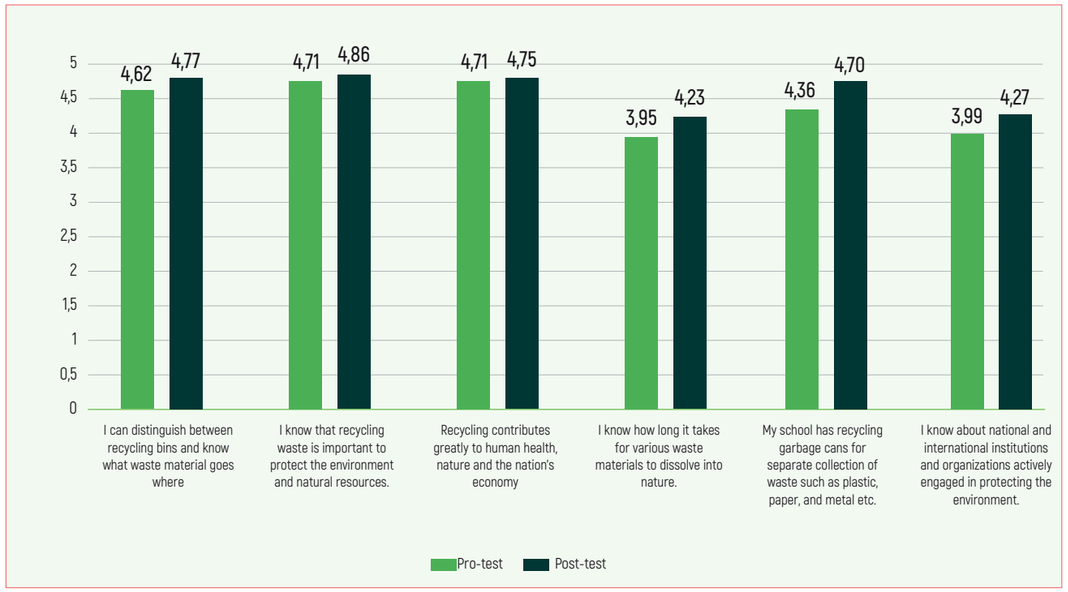


Chart 12: Circular Economy and Project Management II

The chart above includes the rating of the items indicating the teachers' level of knowledge of environmental literacy, the understanding they have gained, and the potential change in attitude they will experience at the end of the training. Consistent with the findings in Chart 12, there was one area in project management processes that was open to development. In general, based on the responses to this attitude scale, it can be projected that teachers have environmental literacy and can transfer the knowledge acquired in the educational program to their professional and personal lives. However, social desirability[3], which is a handicap for quantitative research techniques, should also be considered in the context of the environmental literacy educational program. Finally, in this context, the pre- and post-test questions asked about teachers' expectations of this educational program and the teaching practices they would consider using after training. The following table contains statements about participating teachers' expectations and plans at the beginning and end of the program.

[3]Social desirability is the tendency of some respondents to report an answer in a way that they consider more socially acceptable, withholding the "real" answer.

Start of the Educational Program	End of the Educational Program
"I believe they will become individuals who care more about other living things (plants and animals), think twice before littering, and warn the people around them, taking their country to a better level in every way."	"I realized I wasn't alone in being environmentally conscious. Professional volunteers working in this field made me look to the future with hope and confidence. And with this training, I realized that it's possible to be more sensitive towards the environment and embrace more conscious behaviors using methods that aren't boring at all."
"I think my students will now embrace a much more protectionist attitude about street-littering. They will recognize the importance of recycling and the harms of over-consumerism. Achieving this awareness and realizing that they are contributing to the environment will also help them feel spiritually strong."	"This was already a subject matter I felt strongly about. Throughout my professional life, I have worked with all types of institutions and organizations to increase my students' awareness of these issues. I've found that it makes very important contributions to children's development."
"I can say that I will miss no opportunity to bring up this topic in my classes and reinforce students' learning. As a teacher who runs the Zero Waste Project and participates in recycling projects at school, I make a point of engaging with my students on these topics telling them to respect nature at every opportunity. I believe that with this project I will be able to expand my own horizon and reach out to my students and even parents."	"I learned about the source of global environmental problems and asked myself, what can I do as a person? Secondly, I asked myself, what can I do as a teacher and what can I change? I will make great efforts now, given the new information I have learned in raising generations, that will contribute to solving environmental problems that threaten the whole world and thus us, now and in the future."
"I hope that in order to keep the planet a livable place and to live in a better world in the future, they will have achieved permanent learning and make it a part of their daily lives, starting with their families."	"With this training, I have been able to realize the importance of recycling in our schools. All the students collected the plastic bottles they had been drinking from and brought them to our classroom. Some parents collected the waste paper in their houses and brought it to school. I have observed that we have raised awareness among our students and parents about the importance of recycling. I am very happy for my class and myself. We planted seeds watching them germinate. They learned about what it is like to have a plant of one's own and give it the care it needs. I thank everyone involved for their contributions. It was an enjoyable and useful educational program."
"I think this training will act as a guide for my students to turn into individuals who avoid harming nature and do their best to protect it."	"With this training, I wanted to make environmental changes in our lifestyles at home as a mother, wife, and individual, and as a teacher, increase our students' interest and love for the environment."

Table 3: Teachers' Expectations Before the Project Began and the Changes They Observed at the End of the Project

3.2. Education Program Outcomes from the Perspective of Students

In order to better comprehend the knowledge level achieved by elementary school students, who are among the primary beneficiaries of the Environmental Literacy Educational Program, a pre-test and a post-test were done to students at the end of the program, in a similar way to teachers. In this section of the report, analyses of pre-test and post-test results generated by students are shared.

386 students completed the pre-test questionnaire while 269 students completed the post-test questionnaire. 41% of students who completed the pre-test are in 3rd grade; 27% are in 2nd grade; 24% in 1st grade; and 8% in 4th grade. Half of the students who completed the post-test are in 3rd grade; 30% are in 2nd grade; 15% in 1st grade; and 5% in 4th grade. The 5-point Likert scale that the students answered consists of 20 items. The pre- and post-test include statements about environmental literacy made at the beginning and end of the educational program, at the knowledge and attitude levels. Student responses to these statements are shown below in two separate charts.

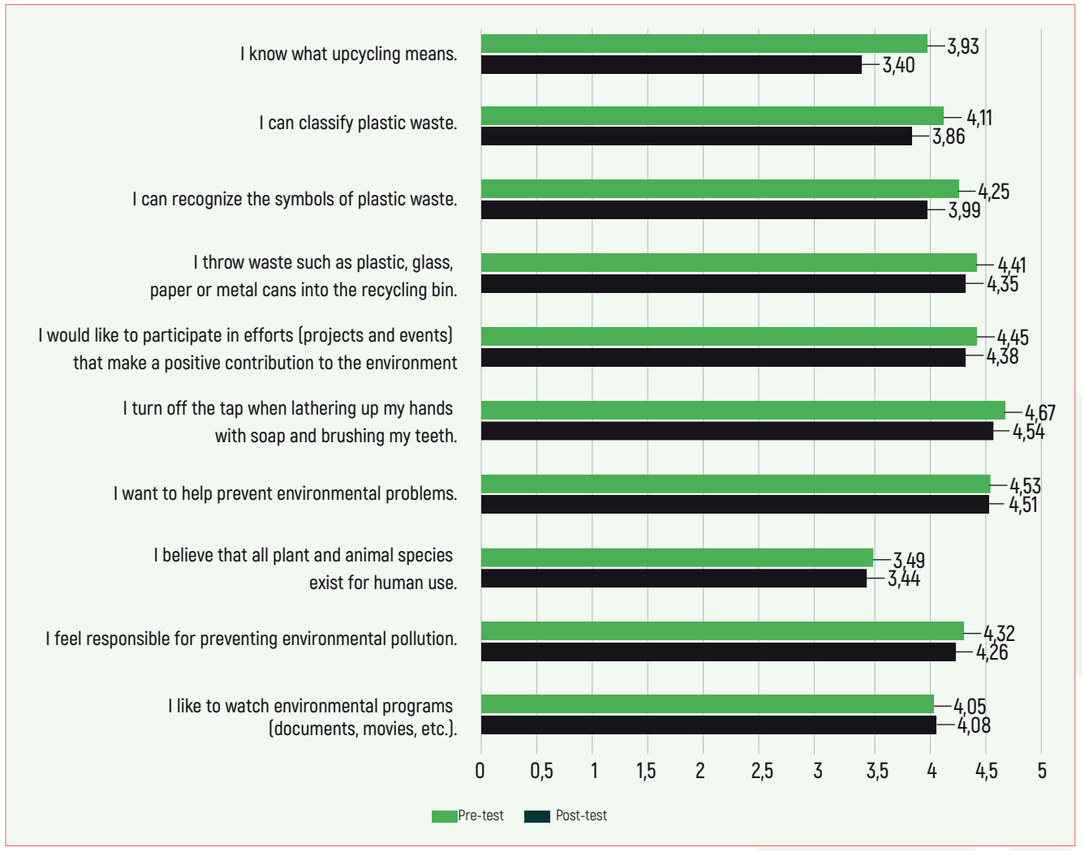


Chart 13: Change in Students' Knowledge and Attitude Levels I- Comparison of Student Pre-test and Post-test

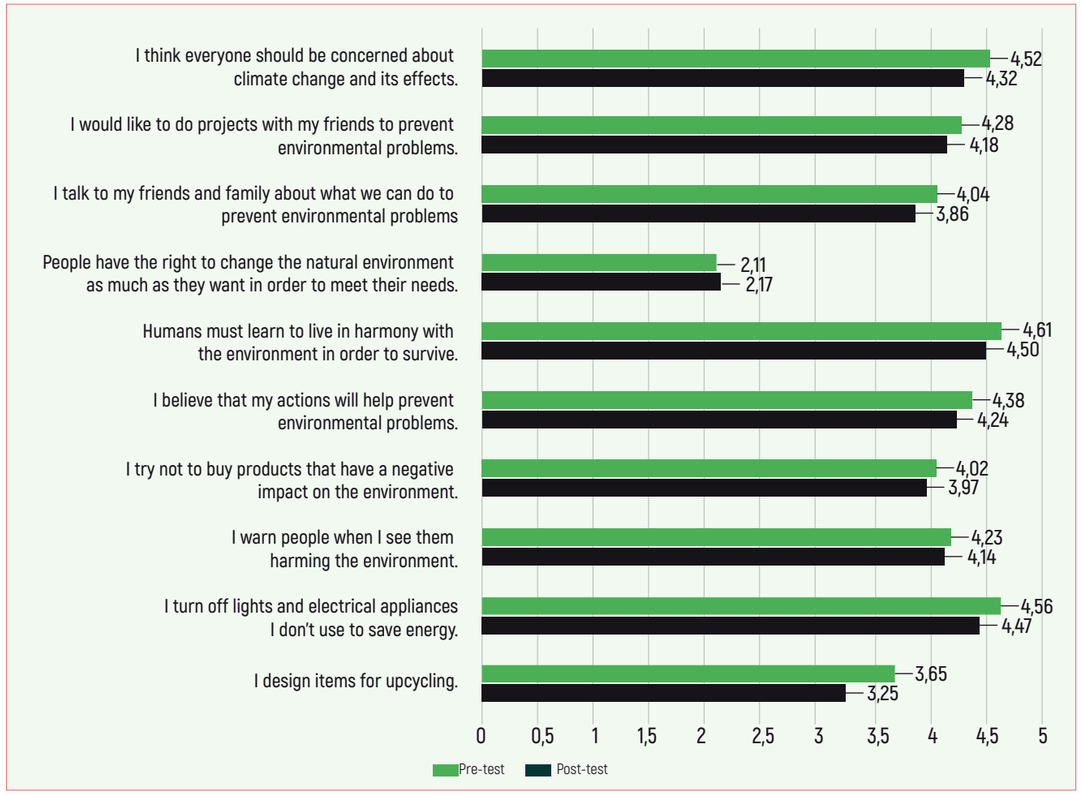


Chart 14: Change in Students' Knowledge and Attitude Levels II- Comparison of Student Pre-test and Post-test

Based on the dataset shared in Chart 13 and 14, there is a significant change in the level of knowledge students have acquired about environmental literacy and their everyday engagements. The score for the statement **"I know what upcycling means"** increased from **3.4** to **3.93**, the score for the statement **"I can classify plastic waste"** increased from **3.86** to **4.11**, and finally the score for the statement **"I know what the plastic waste symbols mean"** saw an increase in score from **3.99** to **4.25,** an example of the positive change in students' knowledge levels. In parallel, the score for the statement **"I turn off the tap when lathering up my hands with soap and brushing my teeth"** increased from **4.54** to **4.67** and the score for the statement **"I warn people when I see them harming the environment"** increased from **4.14** to **4.23** while the increase in the score for the statement **"I try not to buy products that have a negative impact on the environment"** from **3.97** to **4.02** can be cited as an example of positive behavior change among students. In this scale, there is also an item with a negative statement to control the measurement of student change. The decrease in the score for the item **"People have the right to change the natural environment as much as they want in order to meet their needs"** from **2.17** to **2.11** confirms that the students' environmental awareness has changed positively at the end of the project.

At the end of the pre-test and post-test, an open-ended question was added to the fill-in-the-blanks questions to understand what actions students think can be taken to address environmental issues in students' own words: **"..... can be done to prevent environmental problems. Please fill in the blank with the first three things that come to your mind."** Students' responses to this open-ended question in both the pre-test and post-test were analyzed using MAXQDA's MAXDicto module. The obtained data are shared in the following concept maps.

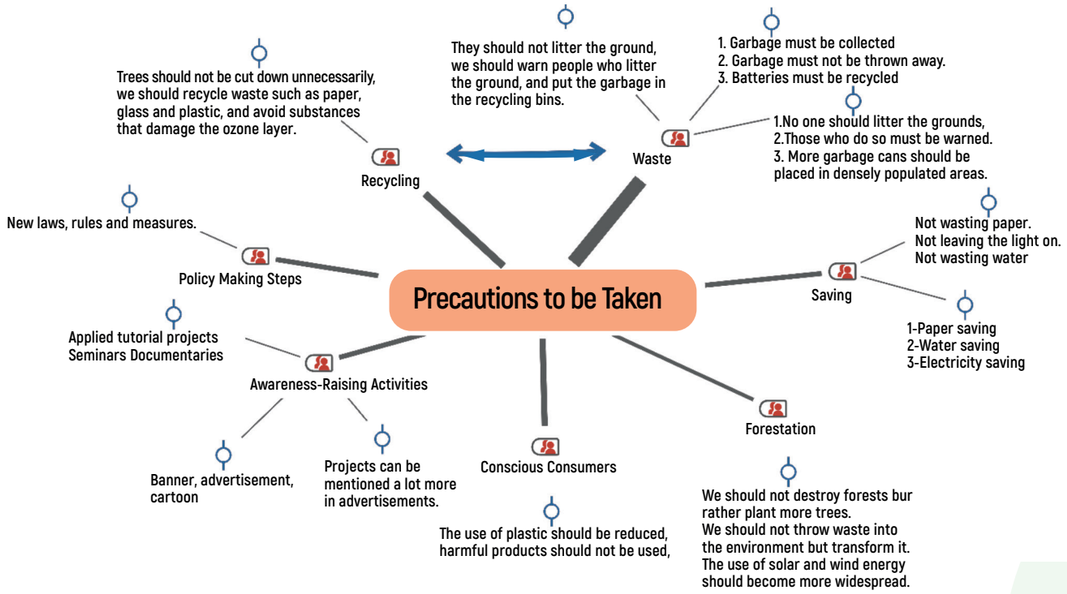


Figure 3: Measures against Environmental Problems from the Students' Point of View Pre-test

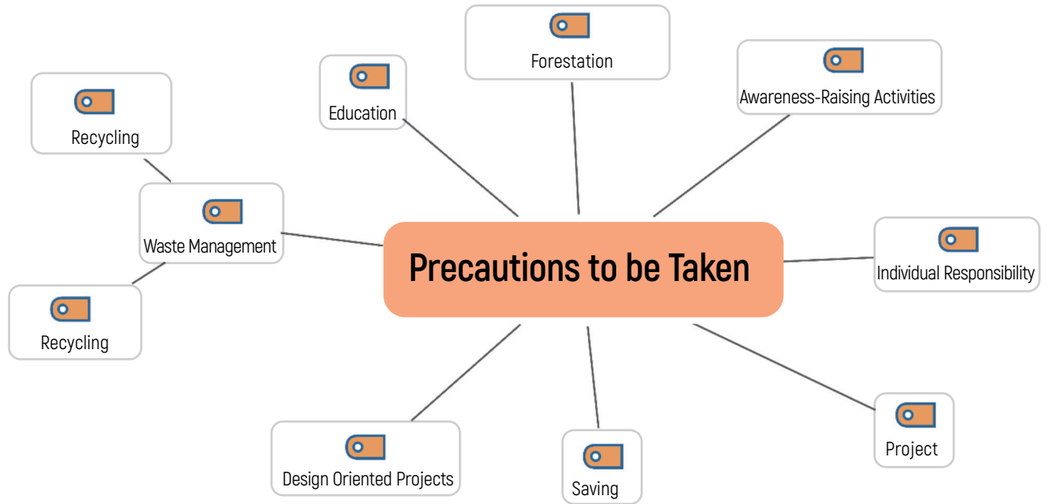


Figure 4: Measures against Environmental Problems from the Students' Point of View Post-test

Students' responses to the question of what actions could be taken to address environmental issues in the pre-test and post-test were analyzed using MAXQDA's MAXDicto module. In this context, different codes were created based on the students' responses. As can be seen in Figure 3 and Figure 4, these codes are directly related to the topics covered in the educational program. There is concurrency between the students' responses in the pre-test and post-test. In addition, it was observed that the items related to the concept of environmental literacy, which had relatively low scores in the previously answered attitude scale, were among the responses given in the post-test. For example, in contrast to the pre-test, students taking the post-test provided responses on topics such as upcycling and composting, which were discussed during the course of the project.

4. MENTORING FOR THE ENVIRONMENTAL EDUCATIONAL PROGRAM

Mentoring refers to the process of facilitating learning and development in a positive and supportive way between someone who has more experience, knowledge, or expertise in a particular area and someone who is new to that area. Depending on the content characteristics and structure of the field in question, mentoring comes into question for different purposes from higher education environments to business ecosystems. The theoretical underpinnings of mentoring are based on theoretical frameworks grounded in the fundamental approaches of developmental psychology such as social constructivism, social learning, and applied learning. This theoretical background helps outline the many benefits for participants, such as interpersonal communication and problem solving, academic performance and motivation, and project management and teamwork. In the context of teacher education in the education world, the mentoring program is based on mutual learning between mentee and mentor. Mentoring contributes to the development of deep learning skills, self-efficacy, and pedagogical competence in the teacher's professional and personal life.

In order for the Environmental Literacy Educational Program to achieve its social impact goals and for its designers to improve and more effectively evaluate educational content and structures in the future, the Teachers Academy Foundation's competent Part-Time Trainer staff and volunteer teachers who completed their training participated in the mentoring program. During the 2-month long mentoring program, 2 meetings were held attended by mentees and mentors. The first of these expert meetings was held under the supervision of sustainability and circular economy consultant Ferda Ulutaş İşevi. The second expert meeting was moderated by Architect and Circular Designer Özgül Öztürk. Expert meetings were held as a live broadcast on Youtube via Streamyard. Parents and students also participated in the expert discussions and had the opportunity to voice their questions. Through these meetings, teachers had the opportunity to share their observations on the social impact of the training extending from students to parents, both in their professional and personal lives. In addition, teachers received feedback on the tasks they were responsible for under the project, accompanied by their mentors. Eleven of the teachers who completed the training and 2-month mentoring program attended the Environmental Literacy Design Camp with their students at the end of the volunteer program. At the end of the camp, a focus group study was conducted attended by 5 teachers to learn more about the social impact of both the training and mentoring process and the online design camp on teachers and students.

Participating teachers emphasized that the mentoring program had a positive impact on their professional and personal development processes. In addition, teachers indicated that they could reach their mentors at any time during the project, and they had their questions about the tasks for which they were responsible always answered.

Picture 1: Examples of Waste Management from Classrooms

Picture 2: Information Boards Prepared by Students at Schools

Picture 3: Sample Student Works

5. ENVIRONMENTAL LITERACY ONLINE DESIGN CAMP

Teachers who completed the Environmental Literacy Educational Program training and mentoring process participated in the Online Design Camp with their students on December 18-19, 2021. On Day 1 of the camp, students and teachers expressed key points of their practices in classrooms as part of the 2-month mentoring process. In this context, the teams experienced the Design-Oriented Thinking methodology by choosing one of the 3 problem situations addressed to them. On the Day 2, the teams presented their projects according to the given instructions. This section of the report discusses the social impact of the two-day long design camp on students.

Children's Voice - Child-Centered

Since the concept of childhood is discussed in the literature mainly under the umbrella of sciences such as developmental psychology, pedagogy, physiology, and biology, the approach to childhood as a biological symptom has paved the way for the emergence of a dominant methodology that proceeds along this axis. Historically, especially since the 1960s, there has been a noticeable proliferation of studies that approach the concept of childhood from a sociological perspective. This new literature, which has emerged under the umbrella of the "New Sociology of Childhood" views the concept of childhood as a social category rather than a biological symptom. Studies that proceed with this conceptual toolbox emphasize that children, like adults, are active social actors in society and that while they create their own unique childhood culture, they also contribute to the culture created by the adult world. In other words, this literature, which addresses the child and childhood through the structure-agent dichotomy[4], emphasizes that children play their part in the social changes that occur and that they take the lead in these ongoing changes. Ultimately, the childhood experience may vary regionally from society to society with variations witnessed even within the same society, depending on the culture. The projections of these innovations that the New Sociology of Childhood brings to the concept of childhood can be found in all social projects that place the child at the center. For example, listening directly to the child rather than talking to primary caregivers such as teachers, parents, psychological counselors, and guidance specialists, is recommended to measure the social impact of a project involving children.

[4]The structure-agent dichotomy is based on the principle that the structural features of social patterns are both mediators and outcomes of the practices in which they are recursively organized. Therefore, social structure is not independent of individuals. The structure-agent dichotomy in childhood studies focuses on the fact that children are both affected by the social structure in which they live and that they influence that structure. For detailed information, please see: Qvortrup, J. (Ed.). (2005). Studies in Modern Childhood: Society, Agency, Culture. Springer.

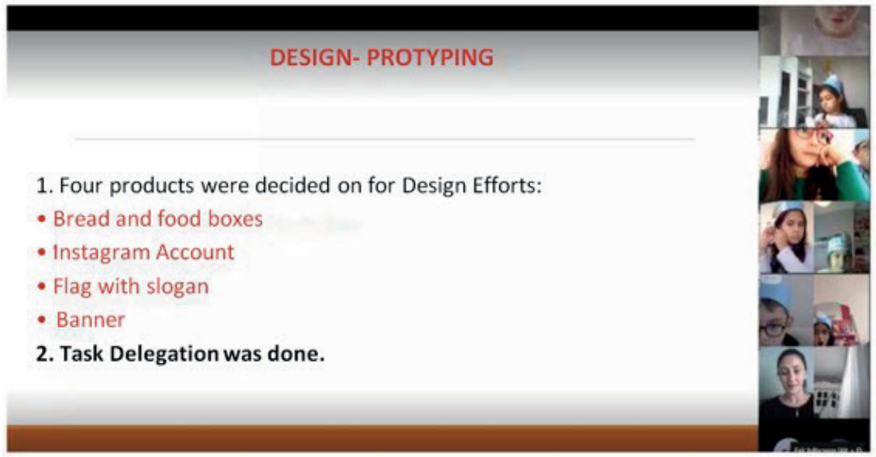
At the Teachers Academy Foundation, the Environmental Literacy Design Camp was prepared in a framework where students take an active role based on this new and dynamic approach. This section of the report discusses the social impact of the two-day design camp on students from three different aspects.

- Impact on social orientation
- Impact on communication and presentation skills
- Impact on project management and teamwork

5.1. Social Impact of the Environmental Literacy Design Camp on Students

5.1.1. Impact on Social Orientation

Students who participated in the Environmental Literacy Design Camp became grew a more keen sense of responsibility towards and awareness of their natural surroundings, both through the work they did in their classrooms and schools during the two-month mentoring program and through their participation in the Design Camp. The teaching practices conducted as part of the project contributed to the students' ability to develop projects that make them adopt a design-oriented way of thinking about a social problem caused by environmental issues in their daily lives. "Nature-loving Caterpillars", one of the teams participating in the design camp, for example, designed a project that focuses on saving bread and food scraps in kitchens to prevent waste at home.



cture 4: Pictures from the Project Presentation of the Team Nature-loving Caterpillars

Picture 5: Pictures from the Project Presentation of the Team Nature-loving Caterpillars 2

Picture 6: Pictures from the Project Presentation of the Team Nature-loving Caterpillars 3

5.1.2. Impact on Communication and Presentation Skills

In the online design camp, students used various Web 2.0 tools under the guidance of their teachers to present the projects they were working on to other teams. When considered in the context of today's world, the design camp allowed students to get acquainted with 21st century skills by using various Web 2.0 tools to find a solution to a problem and pitch the idea to a crowd. Therefore, through the online design camp, students gained insights into 21st century skills such as media literacy and information, communication, and technology literacy, including information, media, and technology skills. For example, students from the "Team Stout Hearts" (Selimli Yürekler) who designed a project focusing on waste management in their schools and classrooms, prepared a video to promote their project.

Picture 7: Project Presentation by the Team Stout Hearts

5.1.3. Impact on Project Management and Teamwork

The Environmental Literacy Educational Program seeks, among other things, to empower students through teachers to think in a design-oriented way and to develop projects aimed at curing or eliminating environmental problems. Each team participating in the Online Design Camp focused on one problem and developed several projects in collaboration with their teammates under the guidance of their teachers. The "Team Zero Waste" designed a project that aims to create compost from food waste through a combination of upcycling and design-oriented thinking. Under the project, the students also talked about the uses of the compost they produce by making fruit and vegetable waste engage with enzymes. One of the members of the "Team Zero Waste" explained that the compost produced by the upcycling process was not only used in agriculture for enriching the soil, but also in many areas from cleaning to cosmetics. The fact that students who are still in elementary school can produce such insightful ideas confirms that the education program has achieved its social impact goals.

Picture 8: Pictures from the Project Presentation of the Team Zero Waste

CONCLUSION

As environmental problems become more complex in both the Global South and the Global North, there is now more need than ever to address and control the social problems caused by these and mitigate their damaging impact. In this sense, a comprehensive environmental education approach that looks at environmental problems from a holistic perspective is a promising way to empower members of society to develop possible solutions to environmental problems and take action to protect natural resources and the environment. This may allow the raising of individuals who are actively engaged with environmental problems in their surroundings. In its most general sense, the concept of environmental literacy refers to the ability of individuals to understand and interpret the state of environmental systems and to make necessary interventions and improvements to make those systems sustainable. Environmental literacy in adult education involves developing social practices against environmental and ecological problems and actively participating in these practices. In the world of children, it includes adding to their knowledge about the environment, enabling them to understand the causes of environmental problems, and come up with possible solutions to social problems caused by environmental issues.

240 teachers completed the Environmental Literacy Training, which was completed in the fall semester of the 2021-2022 academic year across 3 major cities of Turkey. Approximately 5,280 students were reached by participating teachers at primary school level. Monitoring and evaluation activities were carried out in light of the project change theory. According to the findings generated using both quantitative and qualitative techniques, there is an increasing social impact that is not limited to educational environments, also extending from the school to the local through teachers and students. Participating teachers indicated that training had a positive impact on their professional and personal development processes, while emphasizing they had the opportunity to learn concepts they had not heard of before allowing them to brush upon their knowledge of the environment. When video recordings of the online design camp organized at the end of the program were analyzed, it was found that environmental literacy education improved students' social orientation, as they were able to bring possible solutions to environmental problems, and they achieved significant results in competency areas such as communication and presentation skills, as well as project management and teamwork.

REFERENCES

Brereton, P. (2018). Environmental literacy and new digital audiences. Routledge.

Corsaro, W. A. (2017). The sociology of childhood. Sage publications.

Dodds, F., Donoghue, A. D., & Roesch, J. L. (2016). Negotiating the sustainable development goals: a transformational agenda for an insecure world. Taylor & Francis.

Ergler, C. R. (2020). The power of place in play: A Bourdieusian analysis of Auckland children's seasonal play practices (Vol. 17). transcript Verlag.

Qvortrup, J. (Ed.). (2005). Studies in modern childhood: Society, agency, culture. Springer.

www.orav.org.tr

www.ekampus.orav.org.tr

orav2008 #bizbunuyaparız

Öğretmen Akademisi Vakfı

ogretmenakademisivakfi

Öğretmen Akademisi Vakfı

Öğretmen Akademisi Vakfı