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| Research Article \ Araştırma Makalesi |

# Effect of the Environmental Education Program Integrated with Language Activities on 48 to 66 Month Old Children's Environmental Awareness

# Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitim Programının 48-66 Aylık Çocukların Çevre Farkındalıkları Üzerine Etkisi

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**Öz**

Bu araştırma, "Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitimi Programı"nın 48-66 aylık çocukların çevre farkındalığına etkisinin olup olmadığını ortaya koymak amacıyla yapılmıştır. Araştırmanın çalışma grubunu, bir bağımsız anaokuluna devam eden 48-66 aylık çocuklar arasından uygun örnekleme yöntemi ile belirlenen 22 çocuk oluşturmuştur. Çalışma grubunu oluşturan çocuklardan 12 çocuk deney grubu, 10 çocuk kontrol grubu olarak belirlenmiştir. Bu araştırmada ön test – son test kontrol gruplu yarı deneysel desen kullanılmıştır. Araştırmanın temel dayanağı olan veriler; "Kişisel Bilgi Formu" ve Kurt Gökçeli tarafından (2015)'te geliştirilen "48-66 Aylık Çocuklar İçin Çevre Farkındalığı Değerlendirme Ölçeği" ile toplanmıştır. Araştırmanın sonucunda, deney ve kontrol grupları karşılaştırıldığında çocukların çevre farkındalıklarına "Dil Etkinlikleri ile bütünleştirilmiş çevre eğitim programının" nın deney grubu lehine bir ilerlemenin olduğu ve bu ilerlemenin iki grup arasında istatistiksel olarak anlamlı fark yarattığı ($p<0,05$) tespit edilmiştir.

**Anahtar Kelimeler:** Çocuk, çevre eğitim programı, çevre farkındalık, dil etkinlikleri

**Abstract**

This research was conducted to determine whether an "Environmental Education Program Integrated with Language Activities" has an impact on environmental awareness of children aged 48- to 66 months. The sample consisted of 22 children selected using convenience sampling from 48- to 66-month-old children attending a nursery school. Among the sample, 12 children were included in the experimental group and 10 were in the control group. The study used a quasi-experimental pre-test-post-test control group design. The data were collected using a "General Information Form" and the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" developed by Kurt Gökçeli (2015). The analysis results showed that the "Environmental Education Program Integrated with Language Activities" produced significant growth in children's environmental awareness in the experimental group, leading to a statistically significant difference ($p < .05$) between the experimental and control groups in favour of the experimental group

**Key words:** children, environmental education program, environmental awareness, language activities

## Introduction

Language occupies a significant place in education as it is a way for children to express their

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thoughts, feelings, attitudes, beliefs, and value judgements and for educators to convey their knowledge and experiences. Thus, early childhood education programs provide educational environments that support language development in children (Karakuş, 2017).

In early childhood education programs, language activities are the most appropriate activities to contribute to language development. Language activities are also important for "preparing children for primary school" and "helping them acquire the habit of speaking correctly and eloquently", which are the primary goals of early childhood education (MEB [Ministry of National Education], 2013). Language activities foster positive attitudes towards reading at an early age, develop reading habits, and promote early literacy skills (MEB, 2013; Polat, 2014; Turla, 2015).

Stories are the most effective educational tools used in language activities. Activities such as finger games, riddles, rhymes, poetry, story completion, shared book reading, and interactive book reading are also extremely important for children's language development. Furthermore, these activities are likely to produce much more effective outcomes when they are associated with the "environment". Thus, environmental education also provides children with many skills such as positive beliefs, attitudes, habits, knowledge and skills, and awareness, thereby greatly affecting their future lives.

With its increasing importance and essentiality, environmental education in early childhood is a current topic discussed theoretically and practically across the world. For a sustainable environment, environmental education is required to be environmentally aware since childhood, translate environmental awareness into behaviour in everyday life, and most importantly be more sensitive to environment issues (Mahidin & Maulan, 2010; Çalis & Yildirim, 2020).

Although environmental education has many positive effects, its main goal should be to raise environmental awareness. Individuals with environmental awareness take an environmentally oriented perspective in their feelings and thoughts, keep abreast of environment topics, cannot remain indifferent to any threats the environment, feel uneasy about environment problems, act accordingly, and take action, and in short, make an attempt for the good of the environment. Environmental education-related actions and efforts that individuals undertake in childhood and afterwards are at the heart of living with environmentally friendly skills and habits.

Environmental education refers to efforts aimed at informing people about environment problems, make people aware of environment problems, looking for solutions, and implementing solutions as much as possible. Environmental education is the effort of living things to preserve and maintain the existence of the Earth to survive most appropriately and optimally (Stapp, 1997; Damerell, 2007; Wells & Davey Zeece, 2007; Ardoin, 2009; Nagra, 2010; Broyles, 2011). Environmental education involves earning in a natural environment by doing and living, being physically present in nature, and interacting with other people. Ernst (2012) defined environmental education as a form of school-based education where learning experiences related to natural life are integrated into educational programs. Environmental education has its roots in outdoor experiential education and has a great impact on the development of children's natural intelligence (Carey quoted Ernst, 2017, pp. 66-67).

Environmental education more or less contributes to all developmental areas in young children. Thus, it is of utmost importance that environmental education with such profound attainments is given in preschool educational institutions, included in regular educational programs, implemented properly and systematically, and enriched with various experiences and activities. Thus, there arises the need to clarify what environmental education programs

or environmental education practices integrated with different activities are and how they should be planned and implemented.

Environmental education programs can positively influence people's views and perspectives about nature, help them develop deep cognitive structures and show favourable attitudes and behaviour towards nature. Ecological research in early childhood aims to allow a person to first understand themselves more sensitively in relation to the environment and then perceive and realise more meaningful environment experiences as early as possible (Brusaferro, 2020, p. 6). Activities and educational programs designed for this purpose, including environmental education, should be implemented in such a way that they can easily be incorporated into children's lives. A considerable volume of research has recently been conducted on environmental education programs and environmental education. Previous studies have investigated children's environmental awareness, environment consciousness, environment literacy, and environment knowledge in relation to various variables such as age (Musser and Diamond, 1999; Çabuk, 2001; Ahi and Balcı, 2017), gender (Çabuk, 2001; Kesicioğlu & Alisinanoğlu, 2009; Kahriman-Öztürk, 2010; Kahriman-Öztürk et al., 2012; Yalçın, 2013; Ahi & Balcı, 2017), the environmental education implemented (Cevher-Kalburan, 2009; Alıcı, 2013; Cengizoğlu, 2013; Yalçın, 2013; Ahi, 2015; Erol, 2016), and the place of residence (Grodzinska-Jurczak et al., 2006; Kesicioğlu & Alisinanoğlu, 2009; Özen Uyar and Genç, 2016). These studies have reported that as children's age advances, their environmental awareness, positive environment attitudes, environment knowledge, and environment literacy increase. Various environmental education practices heighten children's environmental awareness (Cevher-Kalburan, 2009; Yalçın, 2013; Erol, 2016) and help children build mental models about environment issues (Ahi, 2015).

Environmental education activities also substantially improve children's cognitive skills, physical protection, build desirable skills for physical protection and environment protection (Alıcı, 2013), and lead to positive changes in children's perspectives on deforestation, biological diversity, and climate change (Cengizoğlu, 2013). In addition to environmental education programs and practices, environmental education activities integrated with different methods, techniques, activities also offer substantial contributions. Environmental education mostly employs field trips, scientific activities (such as analogy, demonstration, concept maps, experiments), projects, and drama (Aysu, 2019; Gezgin, 2019; Kütük, 2019; Sarıbıyık, 2019).

Environmental education practices integrated with language activities, which are not so often used but lead to favourable changes when used, are also of great importance. Various activities (e.g., stories, finger games, rhymes, conversations, and riddles) performed at home and school using different methods and techniques support children's language and cognitive development. When such activities are environmentally focused and enriched with different materials, they can also help raise children's environmental awareness and produce positive environment perspectives (Garzotto et al., 2010; Erdoğan et al., 2011; Bradbery, 2013).

While there is a large body of literature on the effects of children's picture books on supporting children's language and cognitive development and literacy skills in early childhood, the literature lacks research that investigates the effect of language activities (such as the effect of storybooks) on developing environmental awareness, environment consciousness, environment literacy, and positive environment attitudes, behaviours, habits, and skills (Burke & Cutter Mackenzie, 2010; Bradbery, 2013; Hsiao & Shih, 2015; Freestone and O'Toole, 2016; Biçer, 2020). With this in mind, this research was conducted to investigate the effect of the "Environmental Education Program Integrated with Language Activities" on environmental awareness of children aged 48- to 66 months. This research

sought answers to the following questions:

1. Is there a significant difference between the experimental group and the control group in their mean pre-test environmental awareness scores?
2. Is there a significant difference between the mean pre-test and post-test environmental awareness scores of the experimental group?
3. Is there a significant difference between the mean pre-test and post-test environmental awareness scores of the control group?
4. Is there a significant difference between the experimental group and the control group in their mean post-test environmental awareness scores?

## Method

This research was conducted to determine whether an "Environmental Education Program Integrated with Language Activities" has an impact on environmental awareness of children aged 48- to 66 months.

In line with this purpose, this section presents the research design, sample, data collection instruments, and data analysis methods.

## Research Design

The research used a quasi-experimental pre-test-post-test control group design. Experimental research aims to determine the causal relationship between variables at hand (Büyüköztürk, 2007). A quasi-experimental design is a variant of experimental research used for the same purpose. Quasi-experimental research involves an experimental group that is under the influence of the independent variable and a control group that is not under the influence of the independent variable. In quasi-experimental research, experimental and control groups are determined not using random assignment but based on the equivalence of the groups (Ekiz, 2003; Fraenkel & Wallen, 2006; Kırıkkaya & Bozkurt, 2012). Hypotheses are tested by comparing pre-test and post-test scores of the experimental and control groups. The absence of a statistically significant difference in pre-test scores between the experimental and control groups indicates that the groups are equivalent (Christensen, 2004; Karasar, 2005). Therefore, great care was taken to ensure that the experimental and control groups of the research are as equal as possible. The "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" was administered as a pre-test to the experimental and control groups before the implementation of the environmental education program. No statistically significant difference was found between the groups in their pre-test scores.

The symbolic visualisation of the research design is presented below.

Tablo 1.

The symbolic visualisation of the research design

| | Pre-test | | Post-test |
|---|---|---|---|
| EC | M1 | XEEPITA | M3 |
| CG | M2 | $XC_A$ | M4 |
| EG | Experimental Group taught using the Environmental Education Program Integrated with Language Activities | | |
| CG | Control Group | | |
| M1 M3 | Pre-test and post-test measurements of the experimental group | | |
| M2 M4 | Pre-test and post-test measurements of the control group | | |

| | |
|---|---|
| XEEPITA | Environmental Education Program Integrated with Language Activities applied in the experimental group |
| $XC_A$ | Daily activities applied in the control group |

The independent variable of the research is the "Environmental Education Program Integrated with Language Activities" and the dependent variable is the impact of the "Environmental Education Program Integrated with Language Activities" on children's environmental awareness. Apart from regular educational activities, the "Environmental Education Program Integrated with Language Activities" was applied in the experimental group by the practitioners trained by the researcher, while the usual education program continued to be applied in the control group by the classroom teachers.

The researcher took photos in the experimental group during the implementation of the "Environmental Education Program Integrated with Language Activities". Permission for the photoshoot was already obtained. Thus, the applicability of the program was recorded. Activities were implemented in the experimental and control groups by students who were pursuing an associate degree in child development and took the class "Environmental Education in Early Childhood" given by the researcher. The practitioner students were meticulously instructed in the properties, learning outcomes, and indicators of the environmental education program, which learning situations to create to achieve learning outcomes, how to communicate with children, the physical environment in which communication is established, which stimuli to use in communication, and which methods and techniques to employ. The students chose a topic on environmental education for each week and devised the activity plan and the learning process. The researcher reviewed and evaluated the activities and learning process together with the group of practitioner students.

Methods, techniques, and materials to be used were discussed and revised where necessary. The "Environmental Education Program Integrated with Language Activities" was applied one day a week for six weeks. The children in the control group continued their daily practices by their teachers. The methods, techniques, and materials used in the experimental group were by no means used in the control group.

## Sample

The sample was selected using non-probability convenience sampling. Convenience sampling is used when it is hard to use random or systematic sampling. Convenience sampling involves choosing easily accessible and available units due to limitations that would otherwise be caused by a great deal of required time, money, and effort (Fraenkel & Wallen, 2006; Büyüköztürk et al., 2016). Therefore, the sample was made up of two groups from the practice nursery school operated under X University. One of the groups was designated as the experimental group and the other as the control group. The sample consisted of 22 children including 12 children in the experimental group and 10 children in the control group.

Among the children in the experimental group, 58.3% were boys and 41.7% were girls. In the control group, 50% were boys and 50% were girls. 66.7% of children in the experimental group were only children and 60% of children in the control group were only children. 66.7% of children in the experimental group were first children, while 70% of children in the control group were first child. 91.7% of children in the experimental group and 50% of children in the control group had not previously attended a preschool.

## Data Collection Instruments

The data were collected using a "General Information Form" and the "Environmental

Awareness Assessment Scale for 48- to 66-Month-Old Children" developed by Kurt Gökçeli (2015).

### *General Information Form*

A "General Information Form" was prepared by the researcher to gather information about children. This form consisted of two parts. The first part seeks information about children's gender and birth order, the number of siblings, and whether they attended a preschool educational institution. The second part seeks information about children's families, including parents' age, educational background, and occupation. The researcher filled out general information forms for each child and their family relying on the information in the school files on children's personal development.

### *Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children*

The "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" was developed by the researcher in 2015. The scale is aimed at measuring environmental awareness of children aged 48- to 66 months. It is a dichotomous scale with the response options Yes/No. The Yes responses are scored as 1 and the No responses are scored as 0.

Table 2 outlines the content of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children".

Table 2.

Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Factor 1 Ecosystem** | |
|---|---|
| **Sub-dimensions** | |
| Living and Non-Living Things | 7 items |
| Plants and Animals | 7 items |
| Food Chain | 8 items |
| Biodiversity | 6 items |
| **Total:** | **28 items** |
| **Factor 2 Environmentally Responsible Behaviour** | |
| **Sub-dimensions** | |
| Ecological Awareness | 5 items |
| Use of Energy Sources | 5 items |
| Responsibility towards Historical Artefacts | 3 items |
| **Total:** | **13 items** |
| **Factor 3 Environmental Interest** | 4 items |
| **Total:** | **4 items** |
| **Grand Total:** | **45 items** |

It is recommended to administer the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" in a quiet and comfortable atmosphere. During the administration of the scale, children were shown the picture of each item in the scale, read the instruction of pictures, and asked to respond. Each correct response was rated as one (1) and each incorrect response was rated as zero (0). When a child gave five consecutive incorrect responses, that factor was left out to skip to the next factor. In the instructions, children were asked to show the relevant picture. It took approximately 15 to 20 minutes to administer the entire scale to each child. The raw score for each factor is the number of correct responses.

### *Environmental Education Program Integrated with Language Activities*

The impact of the "Environmental Education Program Integrated with Language Activities" on environmental awareness of children aged between 48 and 66 months was used as a principle for the "Environmental Education Program Integrated with Language Activities".

The "Environmental Education Program Integrated with Language Activities aims to raise children's environmental awareness.

The "Environmental Education Program Integrated with Language Activities" is an integrated program that focuses on topics that children are curious about the environment. The program supported by various methods, techniques (finger games, riddles, poetry, nursery rhymes, storytelling, finding a title for the story) and materials incorporates various types of Language Activities and enables children to participate actively, make predictions about the future, put forward ideas about environment problems, find solutions to problems, and build environmental awareness.

The "Environmental Education Program Integrated with Language Activities is developmentally appropriate and child-centred. Relying on Language Activities covered in the Ministry of National Education Preschool Curriculum, the program allows practitioners to combine and practice systematically and alternately several activities such as riddles, rhymes, finger games, poetry, shared book reading, interactive book reading, story writing, titling stories, story completion, and storytelling. Such experiences and practices mediated by the program are aimed at developing skills such as environmental awareness, environment knowledge, and positive attitude and sensitivity.

### *Design Stages of the Environmental Education Program Integrated with Language Activities*

The stages of designing the "Environmental Education Program Integrated with Language Activities" are presented below.

At the ***first stage***, the relevant national and international studies was examined and reviewed to explore different theories and views about the environment with a specific focus on many issues such as the most common environmental problems and alternative solutions. Accordingly, there are several theories of development and learning.

According to the constructivist approach proposed by Piaget, children can learn many things about the world by exploring the environment and participating in activities (Oltman, 2002; Shin, 2008). The full and effective realisation of such learning depends on the existence of natural environments and the length and quality of time spent in natural environments. Therefore, the direct communication of children with objects and spending time in natural environments are necessary for the realisation of permanent learning.

Rousseau stipulated that education comes from three sources: humans, things, and nature. Rousseau argued that nature has a great influence on children, especially in the early years of life and he advised taking children to open fields and exposing them to fresh air so that they can come into contact with nature (Rousseau, 2009; Gülay & Önder, 2011).

Dewey is one of the first philosophers of education to emphasise environmental education in his theory, arguing that democratic education should ensure the sustainability of humans, society, and life. Dewey (1938) also noted that knowledge and skills depend on the integration of all areas in life. According to Dewey, one purpose of education is to raise individuals who are sensitive to the problems of the society in which they live and who are aware of their responsibilities regarding social problems (Gülay & Önder, 2011; Ogelman, Gülay & Durkan, 2013). Thus, it is of critical importance to design educational programs that introduce environmental issues, develop an awareness of these issues, promote a sense of responsibility, and help individuals become productive problem solvers. Performing these practices, especially in the early years of age, is of great importance for the effectiveness of environmental education (Robertson, 2008).

In line with the theoretical framework, the basic principles of the "Environmental Education Program Integrated with Language Activities" were defined. These principles are as follows:

- A child-centred approach is essential; children should take an active role in the implementation of activities. The teacher should be active in preparing the environment and materials before the implementation.
- A certain order must be followed when performing types of activities. Each type of activity must be used alternately (riddles, rhymes, story writing, etc.),
- It must be systematic; the success of the program relies on keeping to a well-designed schedule of activities.
- Target words (such as food chain, ecosystem, extinction, endemic) relevant to education are of great importance in making sense of environment concepts. Children's attention should be drawn to the target words related to the environment. These words should be explained in an intelligible way and activities should be carried out in such a way to enable children to use these words in everyday life.
- During education, it is essential to practice, observe, explore, and be present in the environment. Activities should be as practice-oriented as possible, implemented in a way that improves children's observation skills, and performed in as many natural environments as possible.
- An evaluation must be done. At the end of each activity, the relevant activity should be evaluated with children. An atmosphere of discussion should be created using questions. The teacher should evaluate themselves and their performance in activities as well as the process of material preparation, the implementation process, the success and effectiveness of learning outcomes and indicators. The teacher should accordingly take the necessary measures for subsequent activities.

At the ***second stage***, in keeping with the information obtained from the literature review, topics that may be most engaging to children were chosen. Accordingly, six topics were identified. At the beginning of the semester, a plan was made by taking into account the academic calendar of associate's degree students. A draw was made to select a group of students who would implement the program. Implementation dates were set. Then, the topics that the group of students would teach were determined at their will. The students were given three weeks of planning to gather information about the topics to teach and to plan, design and develop materials. Meanwhile, the plans and materials designed by the students were checked, examined, and revised if necessary.

At the ***third stage***, target words about the environment were determined. Target words included food chain, extinct, extant, saving, dirty- clean, problem, ecosystem, and different species of plants and animals. These words were often used at the planning and implementation stages.

At the ***fourth stage***, permission was obtained from the administration of the nursery school where environmental education was implemented. Children's families were also informed about the implementation and their permission was obtained. The implementation stage was initiated.

***Implementation Stages of the Environmental Education Program Integrated with Language Activities***

At the ***first stage,*** the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" was administered as a pre-test to the experimental and control groups and the general information form was filled out on 24 October 2019.

At the ***second stage***, the language activity titled "Environment Issues" (Riddle - Rhyme - Storytelling) was implemented on 31 October 2019.

At the ***third stage,*** the language activity titled "Endangered Animals" (Finger Game - Conversation - Story Completion) was implemented. Questions about the activity were asked and evaluated.

At the ***fourth* stage**, the language activity titled "Saving Water "(Poetry - Conversation - Storytelling) was implemented.

At the ***fifth stage***, the language activity titled "Air Pollution" (Conversation - Rhyme - Story Writing) was implemented. Questions about the activity were asked and evaluated.

At the ***sixth stage,*** the language activity titled "Food Chain" (Riddle - Poetry - Storytelling) was applied. Questions about the activity were asked and evaluated.

At the ***seventh stage***, the language activity titled "Endangered Animals" (Finger Game - Conversation - Storytelling) was implemented.

At the ***eighth stage***, the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" was administered as a post-test to the experimental and control groups and the general information form was filled out on 26 December 2019.

## Data Analysis

The data were subjected to statistical analyses. Statistical analysis was performed using SPSS software version 21. Because the data were normally distributed, the Mann-Whitney U test was used for between-group comparisons and the Wilcoxon signed-rank test was used for within-group comparisons. The level of significance was set as .05. A p-value $< .05$ was considered to be indicative of statistically significant difference, while a p-value $> .05$ was indicative of no statistically significant difference.

## Findings

### Findings on Whether There Is a Significant Difference Between the Experimental Group and the Control Group in Their Mean Pre-test Environmental Awareness Scores

*Research Problem 1: Is there a significant difference between the experimental group and the control group in their mean pre-test environmental awareness scores?*

Table 3 shows the means and standard deviations for the mean pre-test scores of the experimental and control groups on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" (EAST).

Table 3.

Means and Standard Deviations for the Mean Environmental Awareness Pre-test Scores of the Experimental and Control Groups

**Pre-test**

| | **Experimental Group** | | | **Control Group** | | |
|---|---|---|---|---|---|---|
| **EAAS** | **n** | **X̄** | **SD** | **n** | **X̄** | **SD** |
| **Ecosystem Factor** | | | | | | |
| Living and Non-Living Things | 12 | 6.58 | 0.51 | 10 | 6.60 | 0.84 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Plants and Animals | 12 | 6.42 | 0.79 | 10 | 6.30 | 0.48 |
| Food Chain | 12 | 4.92 | 1.98 | 10 | 5.30 | 1.57 |
| Biodiversity | 12 | 5.25 | .97 | 10 | 4.60 | .70 |
| **Total** | **12** | **23.17** | **3.07** | **10** | **22.80** | **2.20** |
| **Environmentally Responsible Behaviour** | | | | | | |
| Ecological Awareness | 12 | 4.92 | .29 | 10 | 4.30 | .95 |
| Use of Energy Sources | 12 | 3.67 | .65 | 10 | 3.70 | .67 |
| Responsibility towards Historical Artefacts | 12 | 2.83 | .39 | 10 | 2.90 | .32 |
| **Total** | **12** | **11.42** | **.67** | **10** | **10.90** | **1.45** |
| **Environmental Interest Factor Total** | **12** | **2.33** | **.89** | **10** | **1.50** | **.97** |

As shown in Table 3, the mean pre-test scores on the Ecosystem factor were 23.17 for the experimental group and 22.80 for the control group, the mean pre-test scores on the Environmentally Responsible Behaviour factor were 11.42 for the experimental group and 10.90 for the control group, and the mean pre-test scores on the Environmental Interest factor were 2.33 for the experimental group and 1.50 for the control group. In line with these results, it can be said that the pre-test scores of the experimental and control groups are close.

The Mann-Whitney U test was used to find out whether there is a significant difference between the experimental group and the control group in their mean pre-test scores on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children". Table 4 shows the results of the Mann-Whitney U test for the factors and Sub-dimensions.

Table 4.

Mann-Whitney U Test Results for the Pre-test Scores of the Experimental and Control Groups on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **EAAS** | **Groups** | **Mann-Whitney U Test** | | |
|---|---|---|---|---|
| | | **Mean Rank** | **U** | **P** |
| **Ecosystem Factor** | | | | |
| Living and Non-Living Things | Experimental | 10.83 | 52 | 0.521 |
| | Control | 12.30 | | |
| Plants and Animals | Experimental | 12.33 | 50 | 0.465 |
| | Control | 10.50 | | |
| Food Chain | Experimental | 30.96 | 53.5 | 0.663 |
| | Control | 12.15 | | |
| Biodiversity | Experimental | 13.88 | 31.5 | 0.052 |
| | Control | 8.65 | | |
| **Total** | **Experimental** | **12.13** | **52.5** | **0.616** |
| | **Control** | **10.75** | | |
| **Environmentally Responsible Behaviour Factor** | | | | |
| Ecological Awareness | Experimental | 13.63 | 34.5 | 0.051 |
| | Control | 8.95 | | |
| Use of Energy Resources | Experimental | 11.29 | 57.5 | 0.822 |
| | Control | 11.75 | | |

| | | | | |
|---|---|---|---|---|
| Responsibility towards Historical Artefacts | Experimental<br>Control | 11.17<br>11.90 | 56 | 0.658 |
| **Total** | **Experimental** | **12.13** | **52.5** | **0.591** |
| | **Control** | **10.75** | | |
| **Environmental Interest Factor Total** | **Experimental** | **13.83** | **32** | **0.054** |
| | **Control** | **8.70** | | |

As seen in Table 4, there was no significant difference between the experimental and control groups in the mean rank of their pre-test scores ($p > .05$) on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children", its factors (Ecosystem, Environmentally Responsible Behaviour and Environmental Interest), and its Sub-dimensions.

Given the data in Table 4, it seems that the experimental and control groups had similar levels of environmental awareness before the implementation of environmental education.

## Findings on Whether There Is a Significant Difference Between the Mean Pre-test and Post-test Environmental Awareness Scores of the Experimental Group

The mean pre-test and post-test scores of the experimental group on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" were analysed to explore the effect of the "Environmental Education Program Integrated with Language Activities" on the environmental awareness of the experimental group.

*Research Problem 2: Is there a significant difference between the mean pre-test and post-test environmental awareness scores of the experimental group?*

Table 5 shows the means and standard deviations for the mean post-test scores of the experimental group on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children", which were measured after the implementation of the "Environmental Education Program Integrated with Language Activities".

Table 5.

Means and Standard Deviations for the Experimental Group's Total Pre-test and Post-test Scores on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Groups** | | **Pre-test** | | **Post-test** | | |
|---|---|---|---|---|---|---|
| **Experimental Group** | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
| **Ecosystem** | | | | | | |
| Living and Non-Living Things | 12 | 6.58 | .51 | 12 | 6.75 | 0.45 |
| Plants and Animals | 12 | 6.42 | .79 | 12 | 6.83 | 0.58 |
| Food Chain | 12 | 4.92 | 1.98 | 12 | 6.08 | 1.44 |
| Biodiversity | 12 | 5.25 | .97 | 12 | 5.50 | .90 |
| **Total** | **12** | **23.17** | **3.07** | **20** | **25.17** | **2.25** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Environmentally** | | | | | | |
| **Responsible Behaviour** | | | | | | |
| Ecological Awareness | 12 | 4.92 | .29 | 12 | 4.92 | .29 |
| Use of Energy Resources | 12 | 3.67 | .65 | 12 | 3.92 | .29 |
| Responsibility towards Historical Artefacts | 12 | 2.83 | .39 | 12 | 3.00 | 0.00 |
| **Total** | **12** | **11.42** | **.67** | **12** | **11.83** | **0.39** |
| **Environmental Interest** | | | | | | |
| **Total** | **12** | **2.33** | **.89** | **12** | **3.00** | **.95** |

As shown in Table 5, the mean pre-test and post-test scores of the experimental group on the Ecosystem factor were 23.17 and 25.17, the mean pre-test and post-test scores on the Environmentally Responsible Behaviour factor were 11.42 and 11.83, and the mean pre-test and post-test scores on the Environmental Interest factor were 2.33 and 3.00. The mean post-test scores on the factors and sub-dimensions were higher than the mean pre-test scores. This result seems to be in favour of the experimental group.

Table 6 displays the results of the Wilcoxon signed-rank test performed to determine whether there is a significant difference between the pre-test and post-test scores of the experimental group on the Factors and Sub-dimensions of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children".

Table 6.

Wilcoxon Signed-Rank Test Results for the Experimental Group's Total Pre-test and Post-test Scores on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children** | **Experimental Group Wilcoxon Signed-Rank Test** | |
|---|---|---|
| | Z | p |
| **Ecosystem** | | |
| Living and Non-Living Things (pre-test) | | |
| Living and Non-Living Things (post-test) | -0.816 | 0.414 |
| Plants and Animals (pre-test) | | |
| Plants and Animals (post-test) | -1.89 | 0.043* |
| Food Chain (pre-test) | | |
| Food Chain (post-test) | -1.86 | 0.048* |
| Biodiversity (pre-test) | | |
| Biodiversity (post-test) | -1.13 | 0.257 |
| **Total (pre-test)** | | |
| **Total (post-test)** | -2.42 | 0.015* |
| **Environmentally Responsibility Behaviour** | | |
| Ecological Awareness (pre-test) | | |
| Ecological Awareness (post-test) | 0 | 1 |
| Use of Energy Resources (pre-test) | | |
| Use of Energy Resources (post-test) | -1.13 | 0.257 |
| Responsibility towards Historical Artefacts (pre-test) | | |
| Responsibility towards Historical Artefacts (post-test) | -1.41 | 0.157 |
| **Total (pre-test)** | | |
| **Total (post-test)** | -1.66 | 0.096 |

| | | |
|---|---|---|
| **Environmental Interest** | | |
| **Total (pre-test)** | | |
| **Total (post-test)** | -2.5 | 0.011* |

Given the results of the Wilcoxon signed-rank test for the total pre-test and post-test scores of the experimental group on the factors and sub-dimensions of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" in Table 6, there was no significant difference between the mean pre-test and post-test scores in the Living and Non-Living Things subdimension of the Ecosystem factor ($z = -0.816$, $p > .05$); however, the mean post-test score was higher. A significant difference was found between in the mean pre-test and post-test scores in the Plants and Animals subdimension ($z = -1.89$, $p < .05$) and the Food Chain subdimension ($z= -1.86$, $p<0.05$). Although there was no significant difference between the mean pre-test and post-test scores in the Biodiversity subdimension ($z= -1.13$, $p > .05$), the mean post-test score was higher. There was a significant difference between the mean pre-test and post-test scores on the total Ecosystem factor and its Sub-dimensions ($z = -2.42$, $p < .05$).

Although no significant difference was found between the mean pre-test and post-test scores on the total Environmentally Responsible Behaviour factor and its Sub-dimensions, the mean post-test scores were higher on the total Environmentally Responsible Behaviour factor and its Sub-dimensions (Environmentally Responsible Behaviour factor total pre-test score = 11.42 and total post-test score = 11.83). This result seems to be in favour of the experimental group. It can be said that environment-related Language Activities have a positive effect on the environmental awareness of children in the experimental group.

There was a significant difference between the mean pre-test and post-test scores in the Environmental Interest factor ($z = -2.5$, $p < .05$).

In line with the data in Table 6, it can be said that the "Environmental Education Program Integrated with Language Activities" positively affected environmental awareness levels of children in the experimental group.

## Findings on Whether There Is a Significant Difference Between the Mean Pre-test and Post-test Environmental Awareness Scores of the Control Group

*Research Problem 3: Is there a significant difference between the mean pre-test and post-test environmental awareness scores of the control group?*

Table 7 shows the means and standard deviations for the mean post-test scores of the control group on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children", which were measured after the implementation of the "Environmental Education Program Integrated with Language Activities"

Table 7.

Means and Standard Deviations for the Control Group's Total Pre-test and Post-test Scores on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Groups** | **Pre-test** | | | **Post-test** | | |
|---|---|---|---|---|---|---|
| **Control Group** | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD |
| **Ecosystem** | | | | | | |
| Living and Non-Living Things | 10 | 6.60 | .84 | 10 | 6.70 | .67 |
| Plants and Animals | 10 | 6.30 | .48 | 10 | 5.60 | .97 |
| Food Chain | 10 | 5.30 | 1.57 | 10 | 4.80 | 1.75 |
| Biodiversity | 10 | 4.60 | .70 | 10 | 4.50 | .97 |
| **Total** | 10 | 22.80 | 2.20 | 10 | 21.60 | 3.06 |
| **Environmentally Responsible Behaviour** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ecological Awareness | 10 | 4.30 | .95 | 10 | 4.20 | .42 |
| Use of Energy Resources | 10 | 3.70 | .67 | 10 | 3.80 | .63 |
| Responsibility towards Historical Artefacts | 10 | 2.90 | .32 | 10 | 2.40 | 1.07 |
| **Total** | 10 | 10.90 | 1.45 | 10 | 10.40 | 1.78 |
| **Environmental Interest Total** | 10 | 1.50 | .97 | 10 | 1.20 | .92 |

As shown in Table 7, the mean pre-test and post-test scores of the control group on the Ecosystem factor of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" were as follows: the mean pre-test and post-test scores on the Ecosystem factor were 22.80 and 21.60, the mean pre-test and post-test scores on the Environmentally Responsible Behaviour factor were 10.90 and 10.40, and the mean pre-test and post-test scores on the Environmental Interest factor were 1.50 and 1.20.

Table 8 displays the results of the Wilcoxon signed-rank test performed to determine whether there is a significant difference between the pre-test and post-test scores of the control group on the Factors and Sub-dimensions of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children".

Table 8.

Wilcoxon Signed-Rank Test Results for the Control Group's Total Pre-test and Post-test Scores on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children** | **Groups Control Group** | **Wilcoxon Signed-Rank Test** |
|---|---|---|
| | Z | p |
| **Ecosystem** | | |
| Living and Non-Living Things (pre-test) | | |
| Living and Non-Living Things (post-test) | -0.272 | 0.785 |
| Plants and Animals (pre-test) | | |
| Plants and Animals (post-test) | -1.72 | 0.084 |
| Food Chain (pre-test) | | |
| Food Chain (post-test) | -1.66 | 0.096 |
| Biodiversity (pre-test) | | |
| Biodiversity (post-test) | -0.447 | 0.655 |
| **Total (pre-test)** | | |
| **Total (post-test)** | -1.45 | 0.147 |
| **Environmentally Responsibility Behaviour** | | |
| Ecological Awareness (pre-test) | | |
| Ecological Awareness (post-test) | -0.333 | 0.739 |
| Use of Energy Resources (pre-test) | | |
| Use of Energy Resources (post-test) | -1 | 0.317 |
| Responsibility towards Historical Artefacts (pre-test) | | |
| Responsibility towards Historical Artefacts (post-test) | -1.63 | 0.102 |
| **Total (pre-test)** | | |
| **Total (post-test)** | -1.09 | 0.273 |
| **Environmental Interest** | | |
| **Total (pre-test)** | | |
| **Total (post-test)** | -0.828 | 0.408 |

Given the results of the Wilcoxon signed-rank test for the total pre-test and post-test scores of the control group on the factors and sub-dimensions of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" in Table 8, there was no significant

difference between the mean pre-test and post-test scores in the Ecosystem factor (z = -145, p > .05) and its Sub-dimensions Living and Non-Living Things (z = -0.272, p > .05), Plants and Animals (z = -1.72, p > .05), Food Chain (z= -1.66 p > .05), and Biodiversity (z = -0.447, p > .05).

Similarly, there was no significant difference between the mean pre-test and post-test scores in the Environmentally Responsible Behaviour factor (z = -1.85, p > .05) and its Sub-dimensions Ecological Awareness (z = -1.23, p > .05), Use of Energy Resources (z = -0.91, p > .05), and Responsibility Towards Historical Artefacts (z = -1.41, p > .05).

No significant difference was found between the mean pre-test and post-test scores in the Environmental Interest factor (z = -0.828, p > .05).

## Findings on Whether There Is a Significant Difference Between the Experimental Group and the Control Group in Their Mean Pre-test Environmental Awareness Scores

*Research Problem: Is there a significant difference between the experimental group and the control group in their mean post-test environmental awareness scores?*

Table 9 shows the means and standard deviations for the mean post-test scores of the experimental and control groups on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children".

Table 9.

Means and Standard Deviations for the Total Post-test Scores of the Experimental and Control Groups on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Post-test** | | | | |
|---|---|---|---|---|
| | **Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children** | n | $\bar{X}$ | SD |
| **Experimental** | **Ecosystem** | | | |
| | Living and Non-Living Things | 12 | 6.75 | 0.45 |
| | Plants and Animals | 12 | 6.83 | 0.58 |
| | Food Chain | 12 | 6.08 | 1.44 |
| | Biodiversity | 12 | 5.50 | 0.90 |
| | **Total** | **12** | **25.17** | **2.25** |
| | **Environmentally Responsible Behaviour** | | | |
| | Ecological Awareness | 12 | 4.92 | 0.29 |
| | Use of Energy Resources | 12 | 3.92 | 0.29 |
| | Responsibility towards Historical Artefacts | 12 | 3.00 | 0.00 |
| | **Total** | **12** | **11.83** | **0.39** |
| | **Environmental Interest** | **12** | **3.00** | **0.95** |
| | **Total** | | | |
| **Control** | **Ecosystem** | | | |
| | Living and Non-Living Things | 10 | 6.70 | 0.67 |
| | Plants and Animals | 10 | 5.60 | 0.97 |
| | Food Chain | 10 | 4.80 | 1.75 |
| | Biodiversity | 10 | 4.50 | 0.97 |
| | **Total** | **10** | **21.60** | **3.06** |
| | **Environmentally Responsible Behaviour** | | | |
| | Ecological Awareness | 10 | 4.20 | 0.42 |
| | Use of Energy Resources | 10 | 3.80 | 0.63 |
| | Responsibility towards Historical Artefacts | 10 | 2.40 | 1.07 |
| | **Total** | **10** | **10.40** | **1.78** |
| | **Environmental Interest** | **10** | **1.20** | **0.92** |
| | **Total** | | | |

As seen in Table 9, the mean post-test scores on the Ecosystem factor were 25.17 for the experimental group and 21.60 for the control group, the mean post-test scores on the Environmentally Responsible Behaviour factor were 11.83 for the experimental group and 10.40 for the control group, and the mean post-test scores on the Environmental Interest factor were 3.00 for the experimental group and 1.20 for the control group. Accordingly, the experimental group had a higher mean score than the control group.

The Mann-Whitney U test was performed to find out whether the pre-test scores of the experimental and control groups significantly differ from their post-test scores on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children", which were measured after the implementation of the "Environmental Education Program Integrated with Language Activities". Accordingly, Table 10 shows the results of the Mann-Whitney U test for the factors and Sub-dimensions of the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children".

Table 10.

Mann-Whitney U Test Results for the Total Post-test Scores of the Experimental and Control Groups on the Factors and Sub-dimensions of the Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children

| **Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children** | **Groups** | **Mann-Whitney U Test** | | |
|---|---|---|---|---|
| | | **Mean Rank** | **U** | **p** |
| **Ecosystem** | | | | |
| Living and Non-Living Things (post-test) | Experimental | 11.38 | 58.5 | 0.892 |
| | Control | 11.65 | | |
| Plants and Animals (post-test) | Experimental | 15.42 | 13 | 0.001* |
| | Control | 6.80 | | |
| Food Chain (post-test) | Experimental | 13.58 | 35 | 0.043* |
| | Control | 9.00 | | |
| Biodiversity (post-test) | Experimental | 14.54 | 23.5 | 0.011* |
| | Control | 7.85 | | |
| **Total (post-test)** | **Experimental** | **14.92** | **19** | **0.006*** |
| | **Control** | **7.40** | | |
| **Environmentally Responsible Behaviour** | | | | |
| Ecological Awareness (post-test) | Experimental | 15.08 | 17 | 0.001* |
| | Control | 7.20 | | |
| Use of Energy Resources (post-test) | Experimental | 11.63 | 58.5 | 0.843 |
| | Control | 11.35 | | |
| Responsibility towards Historical Artefacts (post-test) | Experimental | 13.00 | 42 | 0.047* |
| | Control | 9.70 | | |
| **Total (post-test)** | **Experimental** | **14.92** | **19** | **0.003*** |
| | **Control** | **7.40** | | |
| **Total (post-test)** | **Experimental** | **15.58** | **11** | **0.001*** |

| | | |
|---|---|---|
| | **Control** | **6.60** |

According to the results of the Mann-Whitney U test in Table 10, the total post-test scores of the experimental group on the Ecosystem factor and its sub-dimensions Plants and Animals, Food Chain, and Biodiversity were significantly higher compared to the control group ($p < .05$). There was no significant difference between the groups in the other subdimension ($p > .05$).

The total post-test scores of the experimental group on the Environmentally Responsible Behaviour and its Sub-dimensions Ecological Awareness and Responsibility towards Historical Artefacts were significantly higher compared to the control group ($p < .05$).

The total post-test scores of the experimental group on the Environmental Interest factor were also significantly higher compared to the control group ($p < .05$).

**Discussion, Conclusion, Suggestions**

The following results were found in this research conducted to determine whether the "Environmental Education Program Integrated with Language Activities" has an impact on the environmental awareness of children aged between 48 and 66 months:

- Results on whether there is a significant difference between the experimental group and the control group in their mean pre-test environmental awareness scores: No significant difference was found between the experimental group and the control group in their mean scores on the Ecosystem factor of the "Environmental Awareness Assessment Scale for 48 to 66-Month-Old Children" ($p > .05$). This result indicates that the pre-test scores of the experimental and control groups are close. In other words, the groups were similar before the "Environmental Education Program Integrated with Language Activities" was implemented. This allowed the difference between the groups to be observed more clearly after the program was implemented. It can be said that this is the desired result.

  In parallel to this result, in her study titled "The Effect of Story-Based Environmental Education Program on 48-72-Month-Old Children's Environmental Awareness and Attitudes", Biçer (2020) also found no significant difference between the experimental and control groups in their environmental awareness levels.

  Given the data in Table 4, it seems that the experimental and control groups had similar levels of environmental awareness before the implementation of the education program.

- Looking at the results whether there is a significant difference between the mean pre-test and post-test environmental awareness scores of the experimental group, there is a significant difference between their mean pre-test and post-test scores on the sub-dimensions of the Ecosystem factor and on the total Ecosystem factor. There is no significant difference between the mean pre-test and post-test scores on the sub-dimensions of the Environmentally Responsible Behaviour factor and on the total factor. However, the mean post-test scores on the sub-dimensions of the Environmentally Responsible Behaviour factor and on the total factor were higher in the experimental group. There is a significant difference between the mean pre-test and post-test scores on the Environmental Interest factor.

  In parallel to these results, in her study "An Investigation of the Effect of Drama-Based Environmental Education on Children's Environmental Awareness Levels",

Aysu (2019) found a significant difference between the pre-test and post-test scores of the experimental and control groups.

Bradbery (2013) also noted that children's literary works can positively change children's environment attitudes and that children's literature has a huge impact on environmental education. The present research found similar results. The fact that the education program implemented results (in favour of the experimental group shows the effect of the program. In addition, many other studies in parallel with these results (Şallı, Dağal, Küçükoğlu, Niran & Tezacan , 2013; Gülay-Ogelman & Durkan 2014; Lithoxoidou, Georgopoulos, Dimitriou & Xenitidou, 2017; Dilli, Bapoğlu-Dümenci, Turgut-Kesebir, 2018).

In line with the data in Table 6, it can be said that the "Environmental Education Program Integrated with Language Activities" positively affected environmental awareness levels of children in the experimental group.

- Looking at the results whether there is a significant difference between the mean pre-test and post-test environmental awareness scores of the control group, there is no significant difference between their mean pre-test and post-test scores on the Ecosystem factor. Likewise, there is no significant difference between their mean pre-test and post-test scores on the Environmentally Responsible Behaviour factor and on the Environmental Interest Factor. A possible explanation for these results might be that the children in the control group maintained their regular education program and were not exposed to any specific education.

- When the results regarding whether there is a significant difference between the environmental awareness post-test mean scores of the children in the experimental and control groups are examined; according to the results of the Mann-Whitney U test performed to compare the post-test scores of the experimental and control groups on the "Environmental Awareness Assessment Scale for 48- to 66-Month-Old Children" and its factors and Sub-dimensions, the experimental group had significantly higher total post-test scores on the Ecosystem factor and its Sub-dimensions Plants and Animals, Food Chain, and Biodiversity found between the groups in the other subdimension ($p > .05$). The experimental group had significantly higher total post-test scores on the Environmentally Responsible Behaviour and its Sub-dimensions Ecological Awareness and Responsibility towards Historical Artefacts compared to the control group ($p < .05$). The experimental group also had significantly higher total post-test scores on the Environmental Interest factor compared to the control group ($p < .05$).

  Another study showing similarities with the results of the research is the study conducted by Uslucan's (2016) study titled "The Effects of the Environmental Education Program on Pre-School Children's (60-72 month) Environment Attitudes (Sample for Çanakkale)". She also found a significant difference between the experimental and control groups in their levels of environment attitudes after the implementation of the Environmental Education program.

  These results are consistent with those reported by Okur (2012). In her research titled "Outdoor Experiential Education: Ecology Application", Okur aimed to examine the effectiveness of an outdoor environmental education program developed within the

scope of environmental education for sustainable development. The extracurricular environmental education program implemented in the experimental group was more effective affectively, behaviourally, and holistically.
These results are in accord with previous results. According to the findings of the research, it is apparent that the scores of the experimental group significantly differed from those of the control group. It can be said that this difference was caused by the impact of the educational program.

In light of the results of the present study, the following suggestions are offered for further research and practice:

- Education programs can be designed by integrating environment issues with different activities. The effect of education programs can be investigated in experimental studies.
- Education programs with environment-oriented language activities can be used with children from different socio-economic levels or cultures and their impact can be investigated.
- Different research designs can be developed in which language activities are used in environmental education. Longitudinal research can be carried out to observe the long-run effects of environmental education.

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## Geniş Özet

Giriş:

Erken çocukluk döneminde çevre eğitimi bütün dünyada kuram ve uygulama boyutunda tartışılan güncel bir konu olmakla birlikte önemi ve gerekliliği gün geçtikçe artan bir konudur. Sürdürülebilir bir çevre için, bireylerin çocukluklarından beri çevrenin farkında olabilmesi, bu farkındalığını bir davranış olarak sergileyebilmesi, yaşamına geçirebilmesi ve en önemlisi çevre sorunları konusunda daha duyarlı olabilmesi için çevre eğitimi çok önemlidir (Mahidin ve Maulan, 2010; Calis ve Yıldırım, 2020). Erken çocukluk yıllarında çocukların dil-bilişsel gelişimlerini, okuryazarlık becerilerini desteklemek için resimli öykü kitaplarının etkisine ilişkin çok sayıda araştırma varken, çevre farkındalığı, çevre duyarlılığı, çevre okuryazarlık, çevreye olumlu tutum, davranış ve alışkanlık geliştirme becerilerine ilişkin Dil Etkinliklerinin etkisine yönelik bir araştırmanın görülmediği ya da çok sınırlı sayıda farklı araştırmaların (öykü kitaplarının etkisi gibi) (Burke ve Cutter Mackenzie, 2010; Bradbery, 2013; Hsiao ve Shih, 2015; Freestone ve O'Toole, 2016; Biçer, 2020) olduğu göze çarpmıştır. Bu bağlamda araştırma, "Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitimi Programı"nın 48-66 aylık çocukların çevre farkındalığına etkisinin olup olmadığını ortaya koymak amacıyla yapılmıştır. Bu amaç doğrultusunda şu sorulara yanıt aranmıştır:

1. Deney ve kontrol grubunda yer alan çocukların çevre farkındalık ön-test puan ortalamaları arasında anlamlı düzeyde fark var mıdır?
2. Deney grubunda yer alan çocukların çevre farkındalık ön-test/son-test puan ortalamaları arasında anlamlı düzeyde fark var mıdır?
3. Kontrol grubunda yer alan çocukların çevre farkındalık ön-test/son-test puan ortalamaları arasında anlamlı düzeyde fark var mıdır?
4. Deney ve kontrol grubunda yer alan çocukların çevre farkındalık son test puan ortalamaları arasında anlamlı düzeyde fark var mıdır?

Yöntem:

Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitimi Programı'nın 48-66 aylık çocukların çevre farkındalığına etkisinin olup olmadığını ortaya koymak amacıyla yapılan bu araştırmada ön test – son test kontrol gruplu yarı deneysel desen kullanılmıştır. Araştırma kapsamına alınan deney ve kontrol gruplarının olabildiğince denk olmasına özen gösterilmiştir. Deney ve

kontrol grubundaki çocuklara program uygulanmadan önce "48-66 Aylık Çocuklar İçin Çevre Farkındalığı Değerlendirme Ölçeği" ön test olarak uygulanmıştır. Ön test puanlarının her iki grup için de istatistiksel olarak anlamlı olmadığı tespit edilmiştir.

Desende bağımlı değişken, "Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitimi Programı"nın bu çocukların çevre farkındalıklarına etkisi, incelenen bağımsız değişken ise "Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitimi Programı"dır. Çalışmada, deney grubuna seçilen çocuklara bulundukları ortamdaki yaşantılarına ek olarak, araştırmacının eğitim verdiği uygulayıcılar tarafından "Dil Etkinlikleri ile Bütünleştirilmiş Çevre Eğitimi Programı" uygulanırken, kontrol grubundaki çocuklara yine aynı uygulayıcılar tarafından günlük eğitim programlarının uygulanmasına devam edilmiştir.

Araştırmanın örneklemi belirlenirken, olasılıklı olmayan örnekleme yöntemlerinden uygun örnekleme yöntemi kullanılmıştır. Bu araştırmada çalışma grubunu X Üniversitesi'ne bağlı olarak yürütülen uygulama anaokulundan iki grup oluşturmuştur. Bu gruplardan biri deney grubu olarak diğeri kontrol grubu olarak belirlenmiştir. Deney grubunda 12 çocuk, kontrol grubunda 10 çocuk olmak üzere toplam 22 çocuk araştırmanın çalışma grubunu oluşturmuştur.

Sonuçlar ve Tartışma:

Deney ve kontrol grubundaki çocukların "48-66 Aylık Çocuklar İçin Çevre Farkındalığı Değerlendirme Ölçeği" Ekosistem alt faktörü, Çevre Sorumluluk Davranışı alt faktörü ve Çevre İlgi alt faktörü, alt boyutları ve toplam almış oldukları ön test puanlarının sıra ortalamalarında ($p>0.05$) anlamlı bir farklılık olmadığı tespit edilmiştir. Deney grubunda yer alan çocukların çevre farkındalık ön-test/son-test puan ortalamaları arasında anlamlı düzeyde farklılık olup olmadığına ilişkin sonuçlar; Ekosistem alt faktörünün alt boyutları ve toplam ön test/son test puan ($z= -2,42$, $p<0.05$) ortalamaları arasında anlamlı düzeyde bir farklılık olduğu, Çevre Sorumluluk Davranışı alt faktörünün alt boyutlarına ve toplam puanlarına ilişkin ön test/son test puan ortalamaları arasında anlamlı düzeyde bir farklılık olmamakla birlikte son test puanlarının Çevre Sorumluluk Davranışı alt faktörünün toplam puan düzeyinde ve bütün alt boyutlar düzeyinde ve deney grubunda daha yüksek olduğu, (Çevre Sorumluluk Davranışı ön test toplam= 11,42, son test=11,83), Çevre İlgi alt faktörüne ilişkin ($z=-2,5$, $p<0.05$) ön test/son test puan ortalamaları arasında anlamlı düzeyde bir farklılık olduğu tespit edilmiştir. Kontrol grubunda yer alan çocukların çevre farkındalık ön-test/son-test puan ortalamaları arasında anlamlı düzeyde farklılık olup olmadığına ilişkin sonuçlar; Ekosistem alt faktörünün ($z= -1,45$, $p>0.05$), ön test/son test puan ortalamaları arasında anlamlı bir farklılık olmadığı, Çevre Sorumluluk Davranışı alt faktörünün ($z= -1,85$, $p>0.05$) ön test/son test puan ortalamaları arasında anlamlı bir farklılık olmadığı, Çevre İlgi alt faktörüne ilişkin ön test/son test puan ortalamaları arasında ($z=-0,828$, $p>0.05$) anlamlı düzeyde bir farklılık olmadığı ortaya çıkmıştır.

Deney ve kontrol grubunda yer alan çocukların çevre farkındalık son test puan ortalamaları arasında anlamlı düzeyde farklılık olup olmadığına ilişkin sonuçlar; deney ve kontrol grubundaki çocukların "48-66 Aylık Çocuklar İçin Çevre Farkındalığı Değerlendirme Ölçeği" alt faktörleri, alt boyutları ve toplam ön test/son test puanları Mann-Whitney U Testi sonuçlarına göre; deney ve kontrol grubundaki çocukların "48-66 Aylık Çocuklar İçin Çevre Farkındalığı Değerlendirme Ölçeği" Ekosistem alt faktörü toplam son test puanları ile alt boyutları olan Bitki-Hayvan, Besin Zinciri ve Biyolojik Çeşitlilik toplamı (son toplam) puanları deney grubunda anlamlı derecede yüksek olduğu ($p<0,05$), diğer puan türleri açsından gruplar arasında anlamlı bir farklılık olmadığı ($p>0,05$), Çevre Sorumluluk Davranışı alt faktörü ile alt boyutları olan Ekolojik Farkındalık, Tarihi Eserlere Karşı Sorumluluk toplamı(son toplam) puanları deney grubunda anlamlı derecede yüksek olduğu

($p<0,05$), Çevre İlgi alt faktörü toplamı (son toplam) puanları deney grubunda anlamlı derecede yüksek olduğu tespit edilmiştir ($p<0,05$).

Araştırmadan ve alan yazından elde edilen sonuçlar ışığında eğitimci ve araştırmacılara yönelik öneriler geliştirilmiştir.