Early Childhood Education Researches
ISSN: 2980-2393

Makale gönderim tarihi: 25.03.2024 **Makale kabul tarihi:** 11.11.2024

The Use of Video in Early Childhood Environmental Education: An Example on 'Paper'

Elif Öztürk[1], Sinan Erten[2], Rukiye Nur Saygılı[3]

ÖZ

Bu çalışma, erken çocukluk eğitiminde teknoloji kullanımının çocukların çevre sorunlarına yönelik farkındalıklarına etkisini belirlemek amacıyla gerçekleştirilmiştir. Araştırma ön test-son test-kontrol gruplu deneysel desen ile tasarlanmıştır. Araştırmada bir çevre sorunu olan 'kâğıt' konusu, ilgili deney grubuna video destekli öğretimle, kontrol grubuna ise daha öğretmen merkezli sözel öğretimle işlenmiştir. Çalışma grubunu Türkiye sınırları içinde yer alan İç Anadolu Bölgesi'ndeki bir ildeki 2019-2020 eğitim öğretim yılında okul öncesi eğitime devam eden sekiz çocuk oluşturmaktadır. Çalışma grubunun yaşına göre, araştırmanın amacına en uygun şekilde veri toplamak ve derinlemesine bilgi edinmek için nitel araştırma yöntemleriyle görüşme yapılması uygun görülmüştür. Bu amaçla yarı yapılandırılmış görüşmeler yoluyla nitel veriler toplanmıştır. Verilerin analizi, erken çocukluk eğitiminde teknoloji kullanımının çocukların çevre sorunlarına yönelik farkındalıkları üzerinde olumlu bir etkiye sahip olduğunu göstermektedir. Diğer bir sonuç ise eğitimde teknoloji kullanımının çocukların edindikleri bilgilerin kalıcılığı üzerinde olumlu bir etkiye sahip olduğudur. Bu çalışma kapsamında eğitim ve öğretimde görsel öğrenmenin gerekliliğinin ortaya konulmuştur.

Anahtar Kelimeler:
Erken çocukluk çevre eğitimi, Çevre Bilinci, teknoloji, Video destekli öğretim

ABSTRACT

This study aimed to examine the impact of technology integration in early childhood education on children's awareness of environmental issues. The research utilized a pre-test–post-test control group experimental design. The topic of "paper," as an environmental issue, was taught to the experimental group using video-supported instruction, while the control group received teacher-centered verbal instruction. The sample consisted of eight preschool children from a province in Turkey's Central Anatolia Region during the 2019–2020 academic year. To collect in-depth qualitative data appropriate for the participants' age, semi-structured interviews were conducted. Data analysis revealed that the use of technology in early childhood education positively influences children's awareness of environmental issues and enhances the retention of knowledge. The findings underscore the importance of integrating visual learning tools into educational practices, highlighting their potential to foster meaningful and lasting learning experiences.

Keywords:
Early childhood environmental education, Environmental awareness, Technology, Video-assisted instruction

[1] Doç. Dr., Giresun Üniversitesi, Eğitim Fakültesi, Okul Öncesi Eğitimi Bölümü. elif.ozturk@giresun.edu.tr, Orcid ID: 0000-0002-3764-4526.

[2] Prof. Dr., Hacettepe Üniversitesi, Eğitim Fakültesi, Matematik ve Fen Bilimleri Eğitimi Bölümü. serten@hacettepe.edu.tr, Orcid ID: 0000-0001-9546-2387

[3] Yüksek Lisan Öğrencisi, Gazi Üniversitesi, Eğitim Fakültesi, Okul Öncesi Eğitimi Bölümü. rukiyenursaygili@gmail.com, Orcid ID: 0009-0006-7468-5315

Kaynak Gösterimi: Öztürk, E., Erten, S., & Saygılı, R. N. (2024). The Use of Video in Early Childhood Environmental Education: An Example on 'Paper'. *Early Childhood Education Researches, 2*(2), 15-31.

Introduction

21st-century environmental issues such as global warming and climate change, which are the agenda of the century, cause many disasters in the world day by day. Flooding, extreme winds, extreme temperatures, and the destruction of forests are the first couple of these. Accordingly, one of the important objectives of science instruction is to provide students with knowledge and awareness of environmental problems that are increasing based on scientific and technological developments and train them to show attitudes and behaviors towards preventing these problems (Topal, Yıldırım & Önder, 2020). This is possible only by planned environmental education with determined objectives.

The definition of environmental education has been developed and repeated by scientists and researchers, and it has been agreed that it is not just "protecting nature". One of the measures that will play a role in solving these global environmental problems is environmental education. In addition to a meaningful level of environmental knowledge, the positive attitudes, trends towards the environment and the positive behaviors that will develop with them constitute the sine qua non of environmental education (Öztürk & Erten, 2020). This education should start from childhood. This will only happen with the inclusion of environmental education in early childhood education. The success of the environmental education in question will be achieved by a method based on visual and activity, rather than theoretical and theoretical knowledge. An environmental education based on visuals and activities will lead to more permanent follow-up behaviors in students.

When contemporary educational approaches that have an impact on the whole world are examined, it is observed that these approaches focus on the need for education to be student and child-centered (MoNE, 2006, 2013, 2017). In student and child-centered education and training, teachers are passive and students are active. Teachers are not individuals who convey information, but individuals who guide students in reaching out to information. In this case, children are active in classrooms, and special learning materials are used in classrooms to help students learn more easily and more permanently. Some of these materials are developed in light of technological advancements. Technological resources contribute to the creation of appropriate learning environments by offering interactive, dynamic, and collaborative tools that support students' active participation (Elvan & Mutlubaş, 2020). According to Copple and Bredekamp (2010; 174), in developmentally appropriate environments, educators only classroom technology on students' learning experiences and enrich the material, but also access to information, and problem-solving and must be used to perform the conversion.

The use of technological resources provides various benefits in educational settings; however, curricula should also be organized in a way that supports the integration of these resources. Programs do not contain subject-only information and they address interdisciplinary, integrated issues. Worldwide technological developments in every field at the end of the 20th century forced the making of innovations in the field of education. The idea of maintaining education and technology in an integrated manner has been raised. With the acceleration of developments in science and technology day by day, this idea has become a necessity. Education and technology are the requirements of contemporary life, which cannot be considered separate from each other.

Today, technology, which is an indispensable part of a child's life, takes place in children's lives with many technological tools such as television, smartphones, digital cameras, tablets, and computers, and children learn to use them easily (McManis & Gunnewig, 2012, p.14). Children start school having witnessed many technologies. It can be exemplified that children

live together with technology, such as traveling by car or plane, withdrawing money from the bank with a family member, turning the TV on and off, operating the washing machine or observing all these (Dodge & Colker, 1995; cited in Akkoyunlu & Tuğrul, 2002, p.12). It is necessary to ensure that children use these tools in a way that supports their development and learning, rather than preventing the technology in their lives from early childhood.

By using technology in education, the creative capacity of individuals will be increased by gaining critical thinking skills in individuals (Balcı & Eşme, 2001). It aims to solve problems that cannot be solved with traditional learning and teaching methods by using information and communication technologies in education and training. However, for the use of technology to become widespread in schools, school administrators and teachers need to be familiar with the use of technology. In this context, the concept of technology literacy has come to the agenda.

An individual who is technology literate is an individual who knows what technology is, how it is formed, how it shapes society, and how it is shaped by society. The fact that individuals are technology literate will allow them to understand the nature of technology, the relationship between technology and society, the logic of design, and the impact of technology on natural life, and to reflect this knowledge into all the processes of their life and society by integrating them into many subjects such as production, construction, medicine, biotechnology, environment and energy. In this context, it will be able to contribute to maintaining the habitability of our planet from another perspective (Bacanak, Karamustafaoğlu & Köse, 2003). The relationship established through technology-themed materials in nature conservation is significant in fostering individuals' connection with nature. The study conducted by Akçay (2023) demonstrates the importance of integrating technology and nature.

It has also been determined by research that nature-relatedness, defined as having a subjective connection with nature, has positive effects on the health of individuals (Kahriman, 2019). As Louv says, the health of children and the health of the earth are tightly bound together. The author wishes to shed light on “the journeys of children who have severed ties with nature to return to nature” (Louv, 2008). Educators should not be far from nature and naturalism. Only then can they value the environment, and education, prepare learning environments that enable children to explore nature and elements of nature in school and in their immediate surroundings, and support children's development of ecological literacy.

One of the recent highlights is sustainable environmental education. In this way, one of the most important functions of society, children can be provided with values, knowledge and skills related to sustainability (Güler, 2009). What is meant by sustainable environmental education is a multifaceted environmental education that emphasizes what we must do not only for the present but also for the future of our planet (Ozdemir, 2007). Environmental education to be given to young children will provide them with the opportunity to know their environment but also increase their sensitivity to the environment (Güler, 2009). Environmental education also to be given to children from pre-school will contribute to the development of their cognitive and affective characteristics such as recognizing and liking their environment, developing a conscious point of view towards protecting the environment and developing a positive attitude towards the environment (Gulay, 2011). The preschool period is important in the formation of attitudes toward the environment, and environmental education and positive attitudes of children toward the environment continue in the future (Wilson, 1996).

Education is the only way to direct individuals to the desired behavior. Our goal is to ensure the continuity of the learned information, and the only way is through practical education systems. According to Dale (1969), individuals remember 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see, 70% of what they say, 90% of what they say and do. Studies conducted in Turkey reveal that nature-themed, hands-on learning experiences are limited (Öztürk, 2023). The importance of learning through experience is undeniable. In this context, providing nature education with hands-on and technological materials (such as visual and auditory aids) should be encouraged to foster lasting development in values, attitudes, skills, and behaviors associated with the intended knowledge. Considering these factors, this study aims to examine the impact of video-based instructional techniques that engage children's multiple senses and support experiential learning on early childhood environmental awareness, particularly regarding environmental issues.

The video narration technique provides instructional materials enriched with visuals. In this context, video techniques are believed to positively impact the retention of acquired knowledge. Environmental education based on visuals and activities is thought to foster environmental awareness in students at an earlier age. Considering that preschool-aged children are both vulnerable to the effects of global climate change and tend to display environmentally friendly behavioral patterns (UNICEF, 2021), receiving effective environmental education through diverse techniques is essential. Additionally, given that children at this stage are inclined toward concrete thinking due to their cognitive development processes, environmental education delivered through visually enriched video techniques—supporting concrete learning and high retention—is a critical step toward nurturing responsible adults. In addition, individuals who met technology at an early age during the education process will be able to grow up as individuals who are more familiar with technology in the later stages of their life. In this context, it is thought that the use of technology in education will serve both to educate individuals who have created environmental awareness at an earlier age on behalf of the environment and to educate individuals as technology literate education systems.

Method

Research Design

This study aims to examine the effect of technology use in early childhood education on children's awareness of environmental problems. In parallel with the scope of the study, the research was designed with a "pretest–posttest-control group experimental" design (see Table 1). The model called quasi-experimental design (Creswell, 2005) was used to collect the quantitative data of the study, and in order to support and explain the results obtained about the quantitative data, the method of semi-structured interviews was utilized. In the pretest-posttest control group model, two groups are formed by random assignment. One of these groups is determined as the experiment and the other as the control group. Measurement tools are applied both before and after application in the experiment and control group (Karasar, 2012).

Table 1

Research Design

Groups	Pretest	Method	Posttest	Follow-up

Control group (aged 6)	Semi-structured interviews	Verbal instruction and lecture	Semi-structured interviews	One month later interviews about the paper issue and its content
Experimental group (aged 6)	Semi-structured interviews	Video assisted instruction	Semi-structured interviews	One month later interviews about the paper issue and its content

This study, as a control group pretest-posttest quasi-experimental design, designed by repeated measurements of the subjects' outcome variable were obtained as a pre-test before the application and as a post-test after the application by using the same subjects and measurement tools (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz & Demirel, 2012). During the research, the same topics were explained to the experimental group by video-supported instruction and to the control group by verbal instruction. The student answers were recorded by the researcher and frequency tables were created before and after the application.

Study Group

The Study group of this research consists of eight preschool students in a preschool education institution in a city in the Central Anatolia region within the borders of the Republic of Turkey in the 2019-2020 academic year fall semester. All children were selected from the same age group and the classroom. First of all, necessary permissions were obtained from the children's parents and school management for the conduct of the research and data collection. Children whose parents did not give permission were not included in the study. In terms of personal data protection, students interviewed are encoded as G1, G2, ...G8 and their data is transmitted in this way. Random sampling was used for the selection of the population. Random sampling may be used for, in general, the goal of deliberately selecting units that are best suited to enable researchers to address their research questions (Frey, 2018) and also ideal for this research design. The study group has not been exposed to environmental education before. After the preliminary interviews, the experimental and control groups were determined. In the assignment, the answers of the children regarding the self-interview were taken into account to equalize the groups. Accordingly, it was observed that all of the children gave homogeneous answers about the paper and did not know related information about the 'paper' issue. From this point onward, among the children receiving education in the same class, the first four children in the sample group, whose participation was approved by their parents, were randomly assigned to the control group (coded as G1, G2, G3, and G4), while the remaining four children were assigned to the experimental group (coded as G5, G6, G7, and G8).

Data Collection Tools

The child lives intertwined with many natural environment phenomena in early childhood. In this research, the "paper" element, which is seen as an important environmental concept, has been taken to the center. Considering the age of the study group, it was deemed appropriate to interview qualitative research methods to collect data and obtain in-depth information that best suited the purpose of the study. For this purpose, qualitative data via semi-structured interviews were collected.

Table 2

Interview Form Dimensions And Questions About "Paper" For Children

	Dimensions	Questions
Interview aspects about the paper as an environmental issue	substance information	What is paper?
	substance function and usage areas	What does the paper do?
	raw material information	How is the paper obtained?
	substance formation phase	Why and from which substances is the paper obtained?
	post-substance use information	What do we do with the papers we use?

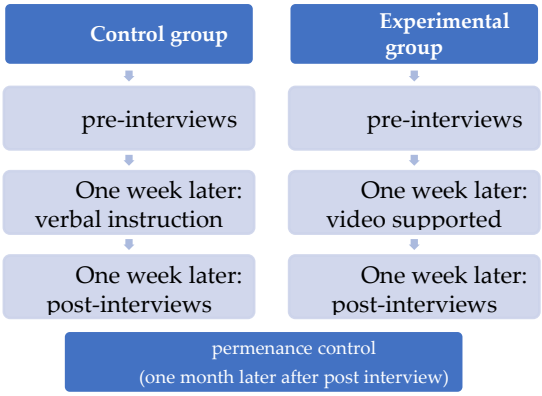
The interview form includes five dimensions: (1) substance information, (2a-b) substance function and usage areas, (3) raw material information, (4) substance formation phase and (5) post-substance use information (see Table 1). In this interview form; what is paper, what does it do, how is it obtained, why is paper obtained and what do we do with the papers we use? questions were posed to children and the answers of the children were noted. The second item among these encompasses two dimensions: (a) the function of the material and (b) the area of application of the material. Interview questions were evaluated by two field experts (academicians in two different universities studying early childhood education and environmental education who have Ph.D.) in the light of the aims of the research to ensure reliability. Interviews with these children in the experimental and control groups were conducted verbally before and after the intervention and for permanence control.

Data Collection and Process

In this study, the students who formed the research group were asked various questions about the paper and its use. At the beginning of the study, the researchers conducted preliminary interviews with the children who formed the research group. The answers given are placed in individual tables and the answer of the eight children who were interviewed by writing the answer of the child is transferred to the table.

Figure 1

Timeline and research process with the control and experimental group



One week later; to the four children in the control group, the answers to questions about the paper issue in detail were explained to the children verbally and through mutual discussion. Designated as an experimental group, the other four children were taken to another room where they were shown videos about the paper issue. One week later, interviews were

conducted with children on the topic of 'paper' in an environment where both verbal and video lessons were taught, minimizing silent and distracting stimuli, with each child being interviewed individually and allotted appropriate durations. About a month later, students were asked the same questions again to determine the permanence of the information learned.

Each of the interviews lasted an average of 9-10 minutes. The data obtained from the answers received from the students were tabulated by frequency analysis from descriptive statistics methods. Their frequencies and percentages are inferred.

Findings

After all interviews were conducted and results and frequencies were obtained, the findings were compared. Preliminary interviews and post-intervention interviews with the experimental and control groups are presented in Tables 2,3,4 and 5.

Pre-Interview Findings

A preliminary interview was conducted with the children in the experimental and control group and "What is paper? What does paper do? Where do we use it? What is paper made of? How Is Paper Made? What do we do with the papers we use?" questions have been asked. The results obtained from the children's responses are as shown in Table 3.

Table 3

Pre-interview data with the experimental and control group frequency table

Information of Substance	**F**	**%**
I don't know what paper is. (G1, G3, G4, G8)	4	50
The thing to write on paper. (G2)	1	12.5
It's the thing to color paper. (G5, G6)	2	25
Paper is what it is for painting. (G7)	1	12,5
a) Function of Matter		
I use paper for writing. (G1, G2, G3, G5, G8)	5	62.5
I use paper to paint. (G4, G7)	2	25
It's good for using paper. (G6)	1	12.5
b) Usage Areas of The Substance		
I use paper in a home environment. (G1, G2, G4, G5, G6, G8)	6	75
I use paper in a social environment. (G1, G3, G6)	3	37.5
Raw Material Information of Matter		
I don't know what paper is raw material. (G1, G2, G3, G4, G6, G7, G8)	7	87.5
Paper is made of white materials. (G5)	1	12.5
Formation Phase of Matter		
I don't know how to make paper. (G1, G2, G4, G6, G7, G8)	6	75
Some papers are made of cardboard. (G3)	1	12.5
It is made by painting from a paper camera. (G5)	1	12.5
Post-Substance Use Information		
I'm throwing away the papers I use. (G1, G2, G3, G4, G5, G6, G7, G8)	8	100

According to these findings, 50% of children stated that they did not know what paper was, 12.5% were for writing, 25% were for coloring, and 12.5% were for painting. 62.5% of children who asked what paper works said they use paper for writing. 25% of the answers children gave to the question "I use paper to paint", 75% of the questions where paper is used in the home environment, and 37.5% of the social media said. Of the answers children gave to the question of what paper is made of; 87.5% did not know, while 12.5% said that paper is made of white materials. Of the answers given by children to the question of how

to make paper, 75% said they did not know, 12.5% were made of cardboard, and the remaining 25% were made by painting from a paper camera. He said he was throwing 100% into the question of what to do with the papers used by children. In the preliminary interview, it is seen from the frequencies in Table 1 that preschool students have very little information about "paper awareness".

Findings After Application

The children in the experimental and control groups were interviewed after practice and asked, "What is paper? What does paper do? Where do we use it? What is paper made of? How is paper made? What do we do with the papers we use? "questions have been raised. The results from the responses of the children are explained in the following tables.

Results for the control group after verbal instruction process: According to the findings in the verbal expression group, 50% of the children stated that they did not know what paper was, while 25% answered that they did not know what paper was, and 25% used it (see Table 4). The question of where paper is used 100% of the children use paper to paint, and the question of where paper is used 100% of the children use it at home. In addition, 50% emphasized using the paper in social settings. 75% of the children answered what paper is made of, as described in the lecture, wood. 100% of the children answered the question of how to make paper do not know. In the question asked to the students about what they did with the used papers, 75% of the students threw the papers, 25% of them accumulated. 25% of the students answered the question about what the collected or collected papers were made because they were back on paper, while 75% said they did not know what they were doing. To the question asked, three of the children (G1, G3, G4) answered "I don't know", while one child (G2) answered, "To have a picnic". The verbal expression technique has also been inadequate in terms of substance recycling awareness.

Table 4

Control group frequency table of interview data after application via verbal expression

Information Of Substance	F	%
I don't know what paper is. (G3, G4)	2	50
The thing to do in the lesson. (G1)	1	25
The thing to use. (G2)	1	25
a) Function Of Matter		
I use paper to paint. (G1, G2, G3, G4)	4	100
b) Usage Areas of The Substance		
I use paper at home. (G1, G2, G3, G4)	4	100
I use paper in social environments. (G1, G2)	2	50
Raw Material Information of The Matter		
I don't know. (G2)	1	25
Paper is made from trees. (G1, G3, G4)	3	75
Formation Stage of The Matter		
I don't know how paper is made. (G1, G2, G3, G4)	4	100
Information After Substance Use		
I throw away the papers I use. (G1, G3, G4)	3	75
I collect the papers I use. (G2)	1	25
Recycling Information of The Matter		
Spooled papers become paper again later. (G1)	1	25
I don't know what to do after the collected papers. (G2, G3, G4)	3	75
Post-Substance Use Information		
I don't know why we hoard the papers. (G1, G3, G4)	3	75
We collect papers for a picnic. (G2)	1	25

When the control group analyzed the interview data after the application (oral presentation), one of the children (G1) answered the question about the article (paper) information "to make lessons". Another of the children (G2) gave "to use", while two (G3, G4) replied, "I don't know". The answers are given according to the use function, while the children do not know substance information. Each of the children (G1, G2, G3, G4) answered "painting/painting". The answers show that children have responded in a narrow frame as much as their own lives have. Also, each of the children (G1, G2, G3, G4) answered "at home" as to where the paper would be used. In addition, two of the children (G1, G2) answered: "in social settings (school, outside, officer)". Children generally stated that they used it in the home environment.

Three of the children (G1, G3, G4) answered "tree" and one child (G2) answered, "I don't know". Children generally had an idea of raw material knowledge after verbal expression. Each of the children (G1, G2, G3, G4) stated that they did not know the stage of the paper's formation. For this reason, it was observed that children could not acquire information during the formation phase of the substance after verbal expression. Three of the children (G1, G3, G4) answered "I am throwing" to the question after substance use. One (G2) answered, "I am saving". In general, children did not gain any knowledge of the substance after use after verbal expression.

Finally, three of the children (G2, G3, G4) answered "I don't know" and one of the children (G1) answered "paper". Verbal expression technique children have been unable to reach permanent knowledge about the recycling knowledge of the substance and their awareness of the recycling of the substance has been inadequate. Three of the children (G1, G3, G4) answered "I don't know" to the question asked on (G2) conversion, while one child (G2) answered, "To have a picnic".

Results for experimental group after video-supported activities: Three of the children (G5, G6, G7) answered "What is made of wood," while one of the children (G8) answered, "I do not know" (see Table 5). In line with the answers, he answered the question of the children's knowledge of the matter in general, based on raw material, close to the knowledge of the dictionary. For the first question asked about the function of the substance and the areas of use of the substance, each of the children (G5, G6, G7, G8) said, "painting, writing; For the second, they answered "home environment and social environment (school)". Accordingly, it is seen that children respond only based on the function that exists in their lives.

Table 5

Frequency table of interview data after application via experimental group video lecture

Information Of Substance	F	%
I don't know what paper is. (G8)	1	25
Paper is what is made of wood. (G5, G6, G7)	3	75
a) Function of Matter		
I use the paper for writing and painting. (G5, G6, G7, G8)	4	100
b) Areas Of Use of The Substance		
I use paper both at home and in social environments. (G5, G6, G7, G8)	4	100
Raw Material Information of The Matter		
Paper is collected, washed, muddy, paper is made. (G5, G6, G7, G8)	4	100
Formation Stage of The Matter		
I don't know how paper is made. (G1, G2, G3, G4)	4	100
Information After Substance Use		
I collect the papers I use. (G5, G6, G7, G8)	4	100

Recycling Information of The Matter		
The collected papers then become paper again. (G5, G6, G7, G8)	4	100
Post-Substance Use Information		
We collect the papers so as not to damage the trees. (G5, G6, G7, G8)	4	100
We use paper to remake paper. (G5)	1	25

Each of the children (G5, G6, G7, G8) answered "from the tree" for the raw material that questioned what the paper was made of. In addition, one of the children (G1) added the answer "old books". The video expression method has been effective for children to gain awareness about substance knowledge. In addition, for the formation phase of the paper, each of the children (G5, G6, G7, G8) responded by generalizing the processes they saw in the video. It is seen that they summarize the process in the form of being deposited, being mud, being poured, being paper. Given their age, the video technique has been sufficient and effective for children to acquire information during the formation stage.

For the question about what happened after the use of the paper, each of the children (G5, G6, G7, G8) answered that they collected. In addition, all children (G5, G6, G7, G8) answered "paper" for the question that examines their awareness of recycling. In addition to the answers, one of the children (G5) also answered "protecting the trees." With this data, it can also be stated that children have information about the recycling information of the substance by video technique. Finally, waste material awareness is a common predictor of recycling. To this question, each of the children (G5, G6, G7, G8) answered "lest the trees be cut down", while in addition one of the children answered, "to make paper again, to breathe". With the Video technique, the children were able to determine the possible causes of the behavior and answer the question about substance awareness.

Follow-up Interview Analysis (Persistence Control)

About a month later, children were asked the same questions again to determine the permanence of the information learned. Thus, it was tried to examine the awareness of children about the paper issue. The data from the control and experimental groups within these interviews are presented in Tables 6 and 7.

Results on control group data for persistence control: According to the results (see Table 6), three of the children (G2, G3, G4) answered "I don't know, while one of the children (G1) answered "Painting". Given the answers of the children, it is clear that they look at the question of substance information from a functional point of view, but they did not give away the answers in the interview process. Each of the children (G1, G2, G3, G4) answered "painting/painting" and "home environment". The answers show that children have responded within a narrow framework as they have in their own lives. They are in correct proportion to their answers during the interview process. Given the answers of these children in the control group, it is clear that the interview process is directly proportional to the answers. While there is still a high proportion of children who do not know why the paper is made, only one child has responded from the tree. In comparison with the answers given by the children during the interview process, it was observed that the children forgot the information in the process. However, each of the children (G1, G2, G3, G4) did not know about the formation stage of the paper. When the answers are compared to the interview process, the children's answers are consistent with each other.

Table 6

Control group (verbal expression) control interview data analysis table (one month later)

Questions	G1	G2	G3	G4
1.	For painting.	I don't know.	I don't know.	I don't know.
2 - a.	Painting	Writing/ Painting	Writing/ Painting	Painting
2- b.	At Home, School.	At Home, School, Policemen.	At Home, School, Car.	At Home.
3.	From the tree.	I don't know	I don't know	I don't know
4.	I don't know.	I don't know.	I don't know.	I don't know.
5.	I don't know	I am Saving	I am Saving	To the trash
6.	I don't know.	I don't know.	I don't know.	I don't know.
7.	I don't know.	I don't know.	I don't know.	I don't know.

Three of the children (G2, G3, G4) answered "I am saving up, we are throwing in the piggy bank", while one of the children (G1) answered, "I don't know". Answers compared to interview process answers, there is a significant difference between the answers. After this study, the children started to collect paper by creating piggy banks in the classroom until the time of the control interview. This situation affects the difference in the natural process. Each of the children (G1, G2, G3, G4) answered "I don't know" when asked what they did with the used papers. There was no significant difference between the answers compared to the interview process answers.

Results related to experimental group data: It is observed that the experimental group gave very effective answers in the interviews conducted to ensure permanence control (see Table 7). When the first question was asked, three of the children (G6, G7, G8) answered "What is made of wood," while one of the children (G5) answered, "I don't know." There has been no significant change in children's responses, no change in information or forgetting in the process, children responded closely to the dictionary definition by approaching it from the point of view of raw material. The situation shows that the video method has been effective for children to learn about substance information, and the answers are directly proportional to the interview answers.

Table 7

Experimental group (video lecture) control interview data analysis table (one month later)

Questions	G5	G6	G7	G8
1.	I don't know.	Paper is made of wood.	Paper is made of wood.	Paper is made of wood.
2 - a.	Writing/Painting	Writing/ Painting	Writing/Painting	Writing/Painting/I gave it to mom as a gift.
b.	At Home, School.	At Home, School.	At Home, School, Car.	At Home, School.
3.	The paper we collected from the tree.	Old paper, the tree.	The tree	The tree
4.	They collect it, it's mud, it's bathed.	They stick it in something like mud, they mix it up, they paint it, it becomes a book.	They take it in the truck, it's mud, then it's paper.	It's a scoop, it's mud.
5.	I am Saving	I am Saving	I am Saving	I am Saving
6.	It's paper again.	To make paper again.	Becoming paper	Becoming Paper

7.	To make paper again, not to damage trees.	To keep the trees from being cut down.	Trees are cut, forests are cut.	Don't cut down the trees

Each of the children (G5, G6, G7, G8) answered "writing and painting" and "home and social environment (school)" when asked again about the function and uses of the paper. The answers of children are directly proportional to the function they give to matter in their lives. In addition, children responded in line with the areas they used in line with their lives. There is no significant difference in these responses compared to the responses children give during the interview process. In other words, when narrated via video, it is observed that even if time passes, there is persistence in learning.

All of the children in the experimental group (G5, G6, G7, G8) answered "from the tree" for the raw material knowledge of the paper and the formation phase of the matter, but two of the children (G5, G6) answered "accumulated papers" in addition. In addition, by generalizing the process of formation of matter, they replied "accumulating, becoming mud, making new paper" in summary. While it is obvious that children have qualified answers given their developmental stages, it is clear that their answers are directly proportional to their answers in the interview process when compared. Again, all of the children stated that they collected the papers after use.

When asked about recycling paper, each of the children (G5, G6, G7, G8) answered "It's becoming paper again". Finally, given the responses mentioned in the table above, it can be said that in terms of waste material awareness, the experimental children have a permanence in learning. When asked the question, each of the children (G5, G6, G7, G8) answered "lest trees be cut down", while one of the children (G5) additionally answered "making paper again". Their answers were found to be in correct proportion with each other compared to the answers given during the interview process.

Conclusion and Discussion

The aim of this study is to examine the potential impact of video-based environmental education on young children's awareness of environmental issues in early childhood education. According to Peraya and Rickenmann (1998) with the advancement of science and technology, information began to be presented in new formats. While quality contributions are made to human life through education and training, developing information and communication technologies are increasingly involved in new teaching approaches (Takmaz et. al, 2018). Alım (2006) emphasized the role of audio and visual media in environmental education. Considering that the discovery of the environment is important for children at an early age and that the perceptions of children are limited by what they see and experience in their environment, it is seen that the education and training processes need to be enriched both at home and at school. Usage of technology in environmental education; within environmental activities, technology offers children research opportunities on many subjects. Especially the use of visual elements, technological devices, and the internet provides opportunities to find direct answers to children's questions about the environment and nature concepts.

The analysis of this research data shows that the use of technology in early childhood education has a positive effect on children's awareness of environmental problems. Another result of the research is that the use of technology in education has a positive effect on the permanence of the knowledge acquired by children. In preliminary interviews conducted during the research process, it is observed that the information of both groups (experiment

and control) is almost identical. However, after verbal and video-supported instruction, the answers to the same questions reveal the difference. Compared to the control group, the intervention in the experimental group had a positive effect on the student's knowledge and persistence in their knowledge about what the paper was, its raw material, and how it was made. 50% of the children who learn by verbal lecture still have not learned what paper is, 75% have not learned its raw material, and 100% have not learned how to do it. Also, 75% failed to gain consciousness of deposition and recycling. On the contrary, 75% of the children who were instructed through video-supported instruction learned what paper was and its raw material, 100% learned how it was made and gained awareness of deposition and recycling. These results show that video-supported instruction, a technological audiovisual element, facilitates learning and understanding in education.

In repeated interviews a month later, 75% of the verbal expression group could not remember what paper was, its raw material, and how it was made, while 100% could not remember information about deposition and recycling. However, 75% of the experimental group instructed by video lecture were able to remember what paper was; 100% were able to remember the raw material of paper, how it was formed, and information about deposition and recycling. These results show us that using audiovisual elements in education greatly increases persistence. These responses show that children gain post-substance use knowledge through video techniques.

As can be seen from the tables created as a result of the study, the form of audiovisual learning is much more permanent and understandable compared to the form of auditory learning. Considering the age group in which the study was conducted, the fact that most of the information learned is close to the first day, even after one month, shows how important it is to use visual elements as well as auditory elements in education. The results of this research show that the video and technology provided in the summary below are supported by research that reveals the positive results of learning the information. Visual elements can be presented to the students with video expression techniques. The important role of visual elements in the process of creating new information for individuals reveals the importance of video expression techniques. Young children have difficulty understanding the perspectives of others, but images and videos, even the youngest students where they live, where they learn to see the perspectives of others can help to what is going on around them (Willis et. al, 2014). When the literature is examined, there are many studies on the use of video narration in learning and teaching environments.

In the related literature, there are current studies that use tools such as video in technology-assisted teaching. It is seen that most studies have obtained similar results with this study. For example, In the study conducted by Areias (2023) to determine the extent and effects of video content usage, it was concluded that video content is effective in enhancing student engagement. Takmaz et al. (2018) concluded that teaching by watching movies can make important contributions as an effective teaching material since it comprehensively emphasizes the behaviors aimed to be created with nature/environment education in their experimental studies, which they conducted by making students watch movies. Demirkuş, Bozkurt and Gülen (2017) provided virtual materials to create popular environmental concepts and concept clusters in the mind correctly and to ensure that they are learned correctly, and achieved successful results in terms of permanence in learning. Similarly, Selanik-Ay (2010) revealed that educational videos contribute to students' learning about environmental issues, their awareness about environmental issues, their knowledge about environmental issues, and the development of environmental awareness. In addition to these, Barbas, Paraskevopaulos, and Stamou (2009) used videos and educational films about the natural environment, environmental pollution and human damage to nature in their studies

investigating the effects of films about the natural environment on the effects of students' views on the environment concluded that it had positive effects on.

According to Galbraith (2004), video expression supports an active learning approach, and the ability to watch it repeatedly when desired makes the video expression technique preferable. Allam (2006) found that video narration had a motivating effect on students and gave them research, problem-solving and collaborative working skills. Willmot, Bramhall and Radley (2012) concluded that the video narration technique enriches the learning materials and process, provides autonomy for learners, provides the basis for active and deep learning and motivates students (Ozan, 2015). In their study, Gokmen and Solak (2015) found that computer-aided execution of Environmental Education provides more meaningful learning than traditional methods.

As supported by many study results, visualness is extremely important in education. With the integration of technology into the educational system, technological tools were introduced in the courses and thus the period of books was ended as the only source of information. With the use of technology in the education system, students have had the opportunity to access more and more information sources. In this context, different methods and techniques have been used in the presentation of the content to the students. One of them is the instruction technique with 'video'.

As a result, the children who were assigned to an experimental group and learned the subject by video expression were more successful than the control group who learned the subject by oral expression method. They have learned the sustainable use of paper. To measure persistence, in the second part of the study, one month later, interviews were conducted again in both groups. It was observed that while the children in the control group forgot the content and details of the subject, the knowledge about paper awareness of the children in the experimental group lectured by video technique became permanent. This significant difference is important for demonstrating the importance of technology in education. This study is also important for demonstrating the necessity of visual learning in education and training.

Recommendations

Environmental awareness is a phenomenon that must be acquired and acquired at an early age. This task is the responsibility of the education system and the program aims to provide students with environmental awareness. Children who have received a well-equipped education from early childhood will become environmentally conscious and environmentally friendly individuals of the future. In addition, they will transfer this awareness and the environmentally friendly behaviors they have acquired from generation to generation, both through their professions and through their family lives.

The increasing number of environmentally friendly individuals in the community will implement environmentally friendly projects, activities, and policies and thus contribute to the survival of our planet for longer. In this context, programs with more activity content can be created for environmental awareness, which is intended to be gained through education given in early childhood education. Active learning environments can be created that allow students to learn by doing and living. For example, recycling laboratories can be created in schools and students can do various activities such as recycling at a basic level such as paper or re-evaluation of waste materials.

Ethical Statement

The authors declare that there is no conflict of interest between them or with any person and/or institution, and that all researchers contributed equally to the study. The authors also state that they comply with all ethical rules during the research process.

Since this research was conducted before 2020 (Fall 2019), there is no need for ethics committee approval.

References

Akçay, G. (2023). The effect of environmental education through augmented reality practices on the environmental awareness of primary school Students [Master's Thesis] Giresun University.

Akkoyunlu, B., & Tuğrul, B. (2002). The effect of preschool children's technological interactions in home life on their computer literacy skills. *Hacettepe University Faculty of Education Journal, 23*(23).

Alım, M. (2006). Environment and Environmental Education in Primary School in Turkey Within the Process of the Membership of European Union. *Kastamonu Education Journal, 14*(2), 599-616.

Allam, C. (2006) in Bijnens, M., Vanbuel, M., Verstegen, S. & Young C., Handbook on Digital Video and Audio in Education, Creating and using audio and video material for educational purposes, The Videoaktiv Project

Areias, M. E. T. F (2023). Envolvimento do Estudante em contextos de aprendizagem enriquecida pela tecnologia: impacto da comunicação vídeo. [Doctoral dissertation] Unıversidade Aberta.

Bacanak, A., Karamustafaoglu, O., & Köse S. (2003). A new perspective: technology literacy in education. *Pamukkale University Faculty of Education Journal, 14*(14), 191-196.

Balci, B. & Eşme, I. (2001). "Technology Education". Science Education Symposium at the Beginning of the New Millennium, 7-8 September, Maltepe University, Istanbul, 214-220.

Barbas, T.A., Paraskevopoulos, S., & Stamou, A.G. (2009). The effect of nature documentaries on students' environmental sensitivity: a case study. *Learning, Media and Technology, 34*, 61 - 69.

Büyüköztürk, Ş., Kılıç-Çakmak, E., Akgün, Ö. E., Karadeniz, S. & Demirel, F. (2012). *Scientific research methods*. Pegem Publishing.Copple,

C. & Bredekamp, S. (2010). *Developmentally appropriate practices in early childhood programs*. Washington, DC: NAEYC.

Copple, C., & Bredekamp S. (2010). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8* (3rd ed.). Washington, DC: NAEYC.

Creswell, J. W. (2005). *Educational research: planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson Education

Dale E. (1969). *Audio-Visual Methods in Teaching* (3rd Ed.), Holt, Rinehart, and Winston 383 Madison Avenue, New York, N. Y. 10017

Demirkuş, N., Bozkurt, T., & Gülen, S. (2017). The study of development visual material in education on popular environmental concepts. *Ahi Evran University Journal of Kirsehir Education Faculty (KEFAD), 18*, 145-157.

Elvan, D. & Mutlubaş, H (2020). Technology Benefits And Use Of Technology In Education-Teaching

Activities. *Mustafa Kemal Üniversitesi Eğitim Fakültesi Dergisi 4*(6), 100-109.

Frey, B. (2018). *The SAGE encyclopedia of educational research, measurement, and evaluation* (Vols. 1-4). Thousand Oaks, CA: SAGE Publications, http://dx.doi: 10.4135/9781506326139.

Galbraith, J., (2004), 'Active viewing: and oxymoron in video-based instruction?', Society for Applied Learning Technologies Conference, designer.50g.com/docs/Salt_2004.pdf

Gokmen, A., & Solak, K. (2015). The effect of computer-assisted environmental education on the success of teacher candidates in matter cycles. *Journal of Gazi Education Faculty, 35*(3).

Gulay, H. (2011). Reliability and validity studies of the Turkish version of the children's attitudes toward the environment scale-preschool version (CATES-PV) and the analysis of children's pro-environmental behaviors according to different variables. *Asian Social Science, 7*(10), 229-240. http://dx.doi: 10.5539/ass.v7n10p229

Güler, T. (2009). The effects of an ecology-based environmental education on teachers' views on environmental education. *Education and Science, 34*(151), 30-43.

Kahriman, D. (2019). *Environmental education in early childhood*. D. Kahriman-Pamuk (Ed.), Environmental education and sustainability in early childhood. Moment Publishing.

Karasar, N. (2012). *Scientific research method-concepts, principles, techniques*. 21st Edition. Nobel Publishing

Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder* (updated ed.). Chapel Hill, NC: Algonquin Books of Chapel Hill.

McManis, L.D., & Gunnewig, S.B. (2012). Finding the education in educational technology with early learners. *Young Children*, 67, 14-24.

MoNE. (2006). Pre-school education program. Istanbul: YA-PA

MoNE. (2013). Pre-school education program. Ankara: MEB

MoNE. (2017). Ministry of National Education, Department of Basic Education, Preschool Education Program. http://tegm.meb.gov.tr/dosya/okuloncesi/ooprogram.pdf

Ozan, O. (2015). Educational video development for e-Learning. *Journal of Open Education Applications and Research, 1*, 59-80.

Ozdemir, O. (2007). A new environmental education perspective: "Education for sustainable development". *Education and Science, 32*(145), 23-38

Öztürk, E. & Erten S. (2020). The effect of the green box project, which is an international environmental education program, on the attitudes, environmental knowledge and environmentally friendly behaviors of pre-service science teachers. Eskişehir Osmangazi University Turkish World Application and Research Center Education Journal, 5(2), 145-166.

Öztürk, E. (2023). Scientific Studies on Climate Change, Children and Education: Current Situation and Suggestions. *Journal of Education in Science, Environment and Health (JESEH), 9*(1), 16-28. https://dx.doi.org/10.55549/jeseh.1231249.

Peraya, D. & Rickenmann, R. (2006). New Perspectives for Media Education, Theory and Practice Abstract français. Educaitonal Media International, 35(2), 125-132. Doi: https://doi.org/10.1080/0952398980350213.

Selanikay, T. (2010). Social Studies Course Student Views On Environmental Awareness Gainingmedia Products To Exploit. *International Journal of Eurasia Social Sciences, 2010*(1), 76-93.

Takmaz, S., Yılmaz, M. & Kalpaklı, F. (2018). Avatar as an instructional material in environmental training/education. *Pamukkale University Journal of Social Sciences Institute, 30,* 249-263.

Thessaloniki-Ay, T. (2010). Social studies course student views on environmental awareness gaining media products to exploit. *Journal of International Eurasia Social Sciences, 1*(1), 76-93.

Topal, M, Güven Yıldırım, E, Önder, A. (2020). Use of educational films in environmental education as a digital learning object. *Journal of Education in Science, Environment and Health*, 6 (2), 134-147. https://doi/10.21891/jeseh.703492

UNICEF. (2021, August 20). UNICEF warns: One billion children at high risk of climate crisis. Retrieved November 2, 2024 from https://www.unicef.org/turkiye/bas%C4%B1n-b%C3%BCltenleri/unicef-uyar%C4%B1yor-bir-milyar-%C3%A7ocuk-y%C3%BCksek-iklim-krizi-riski-alt%C4%B1nda.

Willis J, Weiser B. & Kirkwood D. (2014). Bridging the gap: meeting the needs of early childhood students by integrating technology and environmental education. *International Journal of Early Childhood Environmental Education*, *2* (1), 146.

Willmot, P., Bramhall, M., Radley, K. (2012) *Using digital video reporting to inspire and engage students.* http://www.raeng.org.uk/education/hestem/heip/pdf/Using_digital_video_reporting.pdf

Wilson, R. (1996). The development of the ecological self, *Early Childhood Education Journal*, *24*(2), 121-123.