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Full Length Research Paper

The effect of the activity-based environmental education course on the attitudes and behavior levels of the students of child development program concerning environmental problems

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ABSTRACT

This study aimed to determine the effect of the activity-based environmental education course on the attitudes and behavior levels of the students of the child development program concerning environmental problems. The study was prepared by using the explanatory sequential design, one of the mixed method patterns in which qualitative and quantitative data are used together. While one-group pretest-posttest experimental design was used in the quantitative dimension of the study, phenomenology was employed in its qualitative dimension. The sample group of the study was composed of 60 first-year students attending Kayseri University Hüseyin Şahin Vocational High School Child Development Program in the 2019-2020 academic year (spring semester). Within the scope of the environmental education course, activity-based practices were performed with the students for 6 weeks. The students were divided into groups and one group applied the related activities they prepared with their friends in the classroom each week. Before and after the application, 'The Environmental Problems AttitudeScale' developed by Güven (2013) and 'The Environmental Problems Behavior Scale' developed by Güven and Aydoğdu (2012) were applied for the students. After collecting the quantitative data, 10 students were interviewed via a semi-structured interview form and their opinions on the activities were collected. Kolmogorov-Smirnov test for normality, t-test and Wilcoxon signed-rank test were used to analyze the qualitative data of the study. The qualitative data of the study were analyzed based on descriptive analysis. As a result of the study, it was determined that after the activity-based practices performed in the environmental education course, the scores of the attitude and behavior of the students concerning environmental problems increased. As a result of the interviews made with the students, it was found that the students had both positive and negative opinions on the activities conducted in the course. By these activities, the students emphasized that they had cognitive and affective acquisitions in the environmental education course. Finally, the students stated that they acquired awareness, consciousness, and responsibility about the environmental problems along with these activities.

Keywords: Environmental education, environmental problems, experimental design, mixed method.

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INTRODUCTION

Universities have become more and more active in encouraging the social changes in the sustainable development by developing and applying environmental concerns together with the environmental pollution and

the extinction of natural resources which are among the hardest issues of the 21st century (Guerra, 2018). Within this context, there are courses on environmental education in the curriculum of some departments of the universities. One of these departments is the child development program included in the associate degree programs of universities. The environmental education provided by the higher education institutions has an important effect in raising and preparing the future generations for a green society (Boca and Saraçlı, 2019). An effective environmental education expresses more than a one-way data transmission. An effective environmental education improves the attitude, value and information about the environment and brings individuals to gain skills that will lead them to display positive environmental actions (Ardoin et al., 2020: 1).

Environmental education practices are needed in schools to help children deepen their understanding of a sustainable environment and become individuals who strive for a sustainable future (Ampartzaki et al., 2021). It is more meaningful to teach the courses about environmental education based on active learning rather than direct instruction in order to have the students gain correct attitudes and behavior about the environmental pollution by raising environmental consciousness. This enables the students to participate in the process actively by stopping memorization and participate in the process actively. So, the students reach information by themselves (Kılınç, 2018: 197). Thus, the students will understand, internalize, use, and produce information (Sönmez, 2009: 360).

Constructivism, in which active learning is dominant, provides a student-centered perspective on real-life topics, involves the students in the learning process actively in the environmental education practices and provides a learning opportunity by doing and experiencing. The contents that will provide the acquisitions in the constructivist learning and teaching process should be selected as learner-centered and based on real-life and should be conducted by a cooperative education and in an environment full of mental stimuli (Duman, 2008: 317-325). This process can be performed by activity-based learning applications.

The activity-based learning, which is also defined as applied learning, emphasizes the manipulation of the tangible objects to represent intangible concepts. It states the applications ensure that the individuals build a sense by interacting with their environment (Carbonneau and Marley, 2013). Activity-based learning makes students active participants from being a passive listener. Students comprehend the content better through the activities such as games, brainstorming sessions, discussion, and group assignments. It helps students to learn information in accordance with its real-life use. Also, it has positive effects on students' problem solving skills (Zamir, 2020). In activity-based learning, the activities are selected from the real-life experiences and problems and it is ensured that students focus on studying individually or in groups (Suydam and Higgins, 1977). In accordance with this information, within the scope of the environmental education course performed in the way that the students select a topic related to environmental pollution and prepare activities in groups and apply them in the classroom, it was aimed to determine how the attitudes and behaviors of the students on environmental pollution were affected.

The purpose of the study

The aim of this study was to determine the effect of the activity-based environmental education course on the attitudes and behavior levels of the students from the child development program concerning environmental problems. Within the scope of this main aim, answers were sought for the following questions in qualitative and quantitative dimensions:

Quantitative purposes

1. Is there a significant difference between the students' pre-attitude and post-attitude scores of the attitude levels towards the environmental problems?
2. Is there a significant difference between the students' pre-test and post-test scores of the behavior levels towards the environmental problems?

Qualitative purposes

1. What are the opinions of the students on the activities performed in the environmental education course?
2. What are the opinions of the students on the effects of the activities, performed in the environmental education course, on the course?
3. What are the opinions of the students on the effects of the activities, performed in the environmental education course, on the environmental problems?

MATERIALS AND METHODS

Model of the research

In the study, the explanatory sequential design, which is one of the mixed method patterns in which qualitative and quantitative data are used together, was used. In the explanatory sequential design, quantitative data are collected and analyzed. In order to complete these quantitative data analyzed, qualitative data are collected and analyzed and the study is ended (Büyüköztürk et al.,

2012: 247). In the qualitative dimension of the study, one-group pre-test post-test experimental design was used. In this design, all the participants are assigned to only one group, the experimental group, without random assignment technique. Firstly, pre-testis applied. Then, the experimental application is performed. In the final stage, the post-test is applied and the results are recorded (Gliner et al., 2009/2015: 56). In the qualitative dimension of the study, phenomenology was used. Phenomenological research aims to bring the perceptions and experiences of the individuals to the forefront from their own point of view (Ersoy, 2016: 82).

Study group

The study group of the research was determined according to the easily accessible situation sampling. In this sampling, volunteers are easily reached by the researcher (Gliner et al., 2009/2015: 125). In this direction, the sample group of the study was composed of 60 first-year students attending Kayseri University Hüseyin Şahin Vocational High School Child Development Program in the 2019-2020 academic year (spring semester). After the experimental transactions were performed, the qualitative interviews were conducted with 10 students included in the sample group.

Data collection tools

The quantitative data of the study were collected using 'The Environmental Problems Attitude Scale', developed by Güven (2013), and 'The Environmental Problems Behavior Scale' developed by Güven and Aydoğdu (2012). The Environmental Problems Attitude Scale is composed of 45 items and 5 subscales. The subscales are receiving, responding, valuing, organization, and characterization. Cronbach's Alpha reliability coefficient of the scale is 0.88. Disagree (0), neutral (1) and agree (2) are used for the items in this 3-point Likert scale. The Environmental Problems Behavior Scale is composed of 40 items and 6 subscales. The subscales are perception, setup, guiding, converting into skills, customizing, and creating. Cronbach's Alpha reliability coefficient of the scale is 0.85. Disagree (0), neutral (1), and agree (2) are used for the items in this 3-point Likert scale. The qualitative data of the study were collected by semi-structured interview form developed by the researchers.

Analysis of data

The quantitative data of the study were analyzed using computer-aided statistical software. Firstly, a normality test was made to see whether or not the data had normal distribution to determine the statistical analyses to be applied on the Environmental Problems Attitude Scale and the Environmental Problems Behavior Scale. As it will be more suitable to use Kolmogorov-Smirnov test in the situations where the sample size is more than 50 (Büyüköztürk, 2007: 42), Kolmogorov-Smirnov test was used in this study. As a result of the analysis, the data are normally distributed if a $p > 0.05$ value is obtained. If the $p < 0.05$ value is obtained, the skewness and kurtosis coefficients are examined. If the skewness and kurtosis values range between -2 and +2 values, the data are interpreted to have normal distribution. (Büyüköztürk, 2007: 42; Büyüköztürk et al., 2019: 59). Parametric tests are used for the normally distributed data and non-parametric tests are used for the data without normal distribution. In this study, independent samples t-test was used for the parametric tests. Wilcoxon signed ranks test was used for the non-parametric tests.

Table 1 shows Kolmogorov-Smirnov test on the scores received in the subscales of the Environmental Problems Attitude Scale and the overall scale.

As a result of Kolmogorov-Smirnov test performed for the subscales of the Environmental Problems Attitude Scale and the overall scale, p-value and skewness and kurtosis values were examined. It was determined that receiving, responding and organization subscales were not normally distributed and the valuing and personalizing subscales and the overall scale met the normality hypothesis. Table 2 shows results of Kolmogorov-Smirnov test made for the scores obtained from the subscales of the Environmental Problems Behavior Scale and the overall scale.

As a result of Kolmogorov-Smirnov test performed for the subscales of the Environmental Problems Behavior Scale and the overall scale, p-value and skewness and kurtosis values were examined. It was determined that only the perception subscale did not have a normal distribution. The other subscales and the overall scale met the normality hypothesis.

The qualitative data of the study were analyzed based on descriptive analysis. In the descriptive analysis, the data are interpreted under the comprehensive and semi-private themes which has the quality to meet the purpose of the research (Sönmez and Alacapınar, 2014: 244; Merriam, 2015: 177).

Procedures applied in the research process

Within the scope of the environmental education course in the study, an experimental application was performed within the 6-week process. In the ethical framework, it is important for students to be informed about the process and to participate voluntarily (Petousi and Sifaki, 2020). Before the research, the students were informed about the process and the research was started on a voluntary

Table 1. The results of the Kolmogorov-Smirnov test for the scores obtained in the subscales of the Environmental Problems Attitude Scale and the overall scale.

	Tests	K-S	p	Skewness coefficient	Kurtosis coefficient
Receiving	Pre-attitude	0.170	0.000	-1.341	3.756
	Post-attitude	0.244	0.000	-0.954	-0.030
Responding	Pre-attitude	0.120	0.032	-0.866	0.888
	Post-attitude	0.147	0.002	-1.145	2.539
Valuing	Pre-attitude	0.165	0.000	-0.169	-0.021
	Post-attitude	0.202	0.000	-0.584	0.699
Organization	Pre-attitude	0.100	0.200	0.032	-0.615
	Post-attitude	0.177	0.000	-1.400	2.338
Characterization	Pre-attitude	0.134	0.009	0.109	-0.448
	Post-attitude	0.183	0.000	-0.916	1.336
Total attitude	Pre-attitude	0.142	0.004	-0.732	1.017
	Post-attitude	0.123	0.024	-0.578	-0.211

Table 2. The results of the Kolmogorov-Smirnov test made for the scores obtained from the subscales of the Environmental Problems Behavior Scale and the overall scale

	Tests	K-S	p	Skewness Coefficient	Kurtosis Coefficient
Perception	Pre-test	0.147	0.002	-0.390	-0.418
	Post-test	0.221	0.000	-1.422	2.267
Set up	Pre-test	0.127	0.018	-0.369	0.409
	Post-test	0.155	0.001	-0.662	0.160
Guiding	Pre-test	0.148	0.002	-0.103	-0.845
	Post-test	0.125	0.021	0.060	-0.987
Converting into skills	Pre-test	0.143	0.004	0.162	-0.972
	Post-test	0.166	0.000	-0.363	-0.801
Customizing	Pre-test	0.159	0.001	-0.636	0.620
	Post-test	0.143	0.004	-0.149	-0.986
Creating	Pre-test	0.218	0.000	-0.815	0.842
	Post-test	0.169	0.000	-0.462	-0.577
Total behavior	Pre-test	0.083	0.200	0.250	-0.637
	Post-test	0.113	0.053	-0.718	0.280

basis. Before the application, the 'Environmental Problems Attitude Scale' and the 'Environmental Problems Behavior Scale' were applied as pre-test to all the students. The students were divided into 6 groups, each of which included 10 students. Each week, a group shared the activities it prepared on preschool education about a topic related to environmental pollution with their friends in the classroom. As a result of the 6-week application, the scales applied as pre-test were applied for the students as post-test. Then, 10 students were interviewed and their opinions on the process were received. Table 3 shows the information on the application process.

Table 3. Application process.

Process		The activities performed
Pre-application		Application of pre-tests ●The Environmental Problems Attitude Scale ●The Environmental Problems Behavior Scale
Application	Week 1	Group 1 Topic: The Harms People Inflict on the Living Beings in Nature Activities: Material design, drama application, animation and video show, poster design, play activity
	Week 2	Group 2 Topic: Forests and Forest Fires Activities: Material design, slide and video show, poster design, karaoke show.
	Week 3	Group 3 Topic: Noise Pollution Activities: Material design, puppet show, drama activity with children, experimentation, animation show
	Week 4	Group 4 Topic: Soil Pollution Activities: Material design, drama dance show, preparing videos with slogans, poster design, experimentation
	Week 5	Group 5 Topic: Water pollution Activities: Material design, slide show, experimentation, poster design, drama activity with children
	Week 6	Group 6 Topic: Recycling Activities: Material design, drama activity, slogan and poster design, preparing training videos, recycling products parade, puppet show, interview
Post-application		Application of post-tests ●The Environmental Problems Attitude Scale ●The Environmental Problems Behavior Scale Performing interviews

RESULTS

The results obtained on the quantitative and qualitative dimensions of the study were discussed under separate topics.

Results related to quantitative dimension

Findings on the environmental problems attitude scale and its subscales

Table 4 shows the results of Wilcoxon signed rank test on the students' receiving subscale pre-attitude - post-attitude scores. As a result of Wilcoxon signed rank test, a statistically significant difference was found between the students' pre-attitude and post-attitude scores, in favor of the post-attitude scores [Z = -4.813, p = 0.000].

Table 5 shows the results of Wilcoxon signed rank test on the students' responding subscale pre-attitude - post-attitude scores. As a result of Wilcoxon signed rank test, a statistically significant difference was found between the students' pre-attitude and post-attitude scores, in favor of the post-attitude scores [Z=-4.488, p=0.000].

Table 6 shows the results of the dependent samples t-test of the pre-attitude - post-attitude scores obtained by

Table 4. The results of Wilcoxon signed ranked test on the students' receiving subscale pre-attitude - post-attitude scores.

Pre-attitude - post-attitude	N	Mean rank	Total rank	z	P
Negative Rank	9	20.44	184.00	-4.813	0.000*
Positive Rank	36	23.64	851.00		
Equal	15				
Total	60				

*p < 0.05.

Table 5. The results of Wilcoxon signed rank test on the students' responding subscale pre-attitude - post-attitude scores.

Pre-attitude - post-attitude	N	Mean rank	Total rank	z	P
Negative Rank	15	14.93	224.00	-4.488	0.000*
Positive Rank	39	32.33	1261.00		
Equal	6				
Total	60				

*p < 0.05.

Table 6. The results of dependent samples t-test on the students' valuing subscale pre-attitude - post-attitude scores.

	N	$\overline{X}$	Ss	sd	T	P
Pre-attitude	60	5.33	1.17	59	-5.775	0.000*
Post-attitude	60	6.42	1.09			

the students from the valuing subscale. As a result of the dependent samples t-test, the pre-attitude ($\overline{X}$ = 5.33) and post-attitude ($\overline{X}$ = 6.42) mean scores of the students differentiated statistically and significantly in favor of post-attitude [t(59) = -5.775; p < 0.05].

Table 7 shows the results of Wilcoxon signed rank test on the students' organization subscale pre-attitude - post-attitude scores. As a result of Wilcoxon signed rank test, a statistically significant difference was not determined between the students' pre-attitude and post-attitude scores [Z=-1.564, p = 0.118].

Table 8 shows the results of the dependent samples t-test of the pre-attitude - post-attitude scores obtained by the students from the characterization subscale. As a result of the dependent samples t-test, the pre-attitude ($\overline{X}$ = 6.10) and post-attitude ($\overline{X}$ = 7.80) mean scores of the students differentiated statistically and significantly in favor of post-attitude [t(59) = -6.661; p < 0.05].

Table 9 shows the results of the dependent samples t-test on the pre-attitude - post-attitude scores obtained by the students from the environmental problems attitude scale. As a result of the dependent samples t-test, the pre-attitude ($\overline{X}$ = 69.93) and post-attitude ($\overline{X}$ = 76.57) mean scores of the students differentiated statistically and significantly in favor of post-attitude [t(59) = -6.543; p < 0.05].

Findings on the environmental problems behavior scale and its subscales

Table 10 shows the results of the Wilcoxon signed rank test on the students' perception subscale pre-test - post-test scores. As a result of the Wilcoxon signed rank test, a statistically significant difference was found between the students' pre-test and post-test scores, in favor of the post-test scores [Z = -4.942, p = 0.000].

Table 11 shows the results of dependent samples t-test of the pre-test - post-test scores the students received in the set up subscale. As a result of the dependent samples t-test, the pre-test ($\overline{X}$= 11.27) and post-test ($\overline{X}$ = 12.18) mean scores of the students differentiated statistically and significantly in favor of post-test [t(59) = -2.841; p < 0.05].

Table 12 shows the results of the dependent samples t-test of the pre-test - post-test scores obtained by the students from the guiding subscale. As a result of the dependent samples t-test, the pre-test ($\overline{X}$ = 7.38) and

Table 7. The results of Wilcoxon signed rank test on the students' organization subscale pre-attitude - post-attitude scores.

Pre-attitude - post-attitude	N	Mean Rank	Total Rank	Z	P
Negative Rank	17	30.00	518.00	-1.564	0.118
Positive Rank	35	24.57	860.00		
Equal	8				
Total	60				

Table 8. The results of dependent samples t-test on students' characterization subscale pre-attitude - post-attitude scores.

	N	$\overline{X}$	Ss	sd	t	P
Pre-attitude	60	6.10	1.91	59	-6.661	0.000*
Post-attitude	60	7.80	1.61			

Table 9. The results of dependent samples t-test on the students' pre-attitude - post-attitude scores of the Environmental Problems Attitude Scale.

	N	$\overline{X}$	Ss	sd	t	P
Pre-attitude	60	69.93	7.79	59	-6.543	0.000*
Post-attitude	60	76.57	5.80			

Table 10. The results of Wilcoxon signed rank test on the students' perception subscale pre-test - post-test scores.

Pre-test - post-test	N	Mean rank	Total rank	z	P
Negative Rank	4	17.25	69.00	-4.942	0.000*
Positive Rank	39	22.49	977.00		
Equal	17				
Total	60				

*p < 0.05.

Table 11. The results of dependent samples t-test on the students' set up subscale pre-test - post-test scores.

	N	$\overline{X}$	Ss	sd	t	P
Pre-test	60	11.27	2.46	59	-2.841	0.006*
Post-test	60	12.18	2.58			

*p < 0.05.

post-test ($\overline{X}$ = 8.03) mean scores of the students differentiated statistically and significantly in favor of post-test [t(59) = -2.086; p < 0.05].

Table 13 shows the results of the dependent samples t-test of the pre-test - post-test scores obtained by the students from the converting into skills subscale. As a result of the dependent samples t-test, the pre-test ($\overline{X}$= 14.15) and post-test ($\overline{X}$ = 16.13) mean scores of the students differentiated statistically and significantly in favor of post-test [t(59) = -7.040; p < 0.05].

Table 14 shows the results of the dependent samples t-test concerning the pre-test - post-test scores obtained by the students from the customizing subscale. As a result of the dependent samples t-test, the pre-test ($\overline{X}$= 7.00)

Table 12. The results of dependent samples t-test on the students' guiding subscale pre-test - post-test scores.

	N	$\overline{X}$	Ss	sd	t	P
Pre-test	60	7.38	1.84	59	-2.086	0.041*
Post-test	60	8.03	1.89			

*p < 0.05.

Table 13. The results of dependent samples t-test on the students' converting into skills subscale pre-test – post-test scores.

	N	$\overline{X}$	Ss	sd	t	P
Pre-test	60	14.15	2.46	59	-7.040	0.000*
Post-test	60	16.13	2.23			

*p < 0.05.

Table 14. The results of dependent samples t-test on the students' customizing subscale pre-test - post-test scores.

	N	$\overline{X}$	Ss	sd	t	P
Pre-test	60	7.00	1.67	59	-3.777	0.000*
Post-test	60	7.83	1.53			

*p < 0.05.

and post-test ($\overline{X}$=7.83) mean scores of the students differentiated statistically and significantly in favor of post-test [t(59) = -3.777; p < 0.05].

Table 15 shows the results of the dependent samples t-test concerning the pre-test - post-test scores obtained by the students from the creating subscale. As a result of the dependent samples t-test, the pre-test ($\overline{X}$ = 9.48) and post-test ($\overline{X}$ = 10.653) mean scores of the students differentiated statistically and significantly in favor of post-test [t(59) = -5.350; p < 0.05].

Table 16 shows the results of the dependent samples t-test on the pre-test - post-test scores obtained by the students from the Environmental Problems Behavior Scale. As a result of the dependent samples t-test, the pre-test ($\overline{X}$ = 54.70) and post-test ($\overline{X}$ = 61.52) mean scores of the students differentiated statistically and significantly in favor of post-test [t(59) = -7.752; p < 0.05].

Results related to qualitative dimension

The findings obtained on the qualitative dimension of the study were grouped under 3 main themes. These themes were 'The opinions on the activities', 'The effects of the activities on the environmental education course', and 'The effects of the activities on the environmental problems'. The coding and frequency values on each theme were presented in tables.

1. The opinions on the activities

The sub-themes and coding on the opinions of the students on the activities they performed within the scope of the course were included in this theme. Table 17 shows this coding and frequency information.

The opinions of the students on the activities performed in the environmental education course were evaluated under two subscales in positive and negative contexts. The following coding was formed on the positive opinions: funny, exciting, informative, sharing, cooperative, raising awareness, and leading to research The following coding was formed on the negative opinions: stressful, time-consuming, requires preparation, and tiring. When the opinions of the students, which were the resources of the coding, were examined, one of the students (S8) said "*We prepared an activity about water pollution as a group. And we conducted a very comprehensive research as we would present it both in*

Table 15. The results of dependent samples t-test on the students' creating subscale pre-test - post-test scores.

	N	$\overline{X}$	Ss	sd	T	P
Pre-test	60	9.48	1.72	59	-5.350	0.000*
Post-test	60	10.65	1.62			

*p < 0.05.

Table 16. The results of dependent samples t-test on the students' pre-test - post-test scores of the Environmental Problems Behavior Scale.

	N	$\overline{X}$	Ss	sd	T	P
Pre-test	60	54.70	7.96	59	-7.752	0.000*
Post-test	60	61.52	8.00			

*p < 0.05.

Table 17. The sub-themes, coding and frequency information on the opinions on the activities.

Sub-themes	f
Positive opinions	**32**
Funny	7
Exciting	5
Informative	5
Sharing	5
Cooperative	4
Raising awareness	3
Leading to researching	3
Negative opinions	**9**
Stressful	3
Time-consuming	3
Requires preparation	2
Tiring	1
Total	**41**

Table 18. The sub-themes, coding, and frequency information about the effects of the activities on the environmental education course.

Sub-themes	f
Cognitive effects	**42**
Reinforcement	8
Active participation	8
Permanent learning	7
Transition from theory to practice	6
Productive learning	6
Critical thinking	3
Cooperative learning	3
Developing a point of view	1
Affective effects	**31**
Funny	9
Liking	8
Interest	8
Sense of responsibility	6
Total	**73**

the pre-school institution and in our classroom." and emphasized that the activities led them to research. Another student (S2) said "*The process of activity preparation caused too much stress for me.*" and stated his/her negative opinions about the process.

2. The effects of the activities on the environmental education course

The sub-themes and coding on the opinions of the students about the effects of the activities on the course were included in this theme. Table 18 shows this coding and frequency information.

The opinions of the students on the effects of the activities on the course were assessed under two subscales: cognitive effects and affective effects. The following coding was formed on the cognitive effects: reinforcement, active participation, permanent learning, the transition from theory to practice, productive learning, critical thinking, cooperative learning and developing a point of view. The following coding was formed on the affective effects: funny, liking, interest and sense of responsibility. When the opinions of the students became

a reference for the coding, one of the students (S5) "*I think that the course has become more productive and entertaining with the activities.*" and emphasized the cognitive and affective acquisitions. Another student (S8) stated his/her cognitive acquisition by saying that "*Active participation was provided in the course.*". Another student (S10) stated "*The activities have provided that we evaluate the information we have learned in the course in a more critical way.* "

3. The effects of the activities on the environmental issues

The sub-themes and coding appearing in accordance with the opinions of the students about the effects of the activities on the environmental problems were included in this main theme. This coding and frequency information was presented in Table 19.

The opinions of the students on the effects of the activities performed in the environmental education course on the environmental problems were assessed under 6 categories: gaining awareness, raising people's awareness, butterfly effect, sensitivity, responsibility and love of nature. The gaining awareness sub-theme was separated into two sub-themes: 'Causing environmental problems' and 'Preventing environmental problems'. In the preventing environmental problems sub-theme, 'forest fires, water consumption, recycling, conscious consumption, natural resources and protecting nature' coding were formed. When examining the opinions which were the references for the sub-themes and coding, one of the students (S1) said '*I have recognized the importance of the environment, things to do for the environment and that there are responsibilities every individual has for a clean world.*' and emphasized that the sense of responsibility should be raised to protect environmental problems. Another student (S9) '*I have had knowledge about the forest fires and water consumption with the activities we have conducted. I have started consuming water more consciously*' and emphasized the effects of the activities on the awareness about the environmental problems. Another student (S4) '*I have understood how great harm can the things we throw away even if they are small. I have learned that a little spark can affect the whole world like in the butterfly effect* .'

Table 19. The sub-themes, coding and frequency information about the effects of the activities on the environmental problems.

Sub-themes	F
Gaining awareness	**16**
Causing environmental issues	**8**
Preventing environmental issues	**8**
● Forest fires	2
● Water consumption	2
● Recycling	1
● Conscious consumption	1
● Natural resources	1
● Protecting nature	1
Raising people's awareness	**5**
Butterfly effect	**3**
Sensitivity	**3**
Responsibility	**1**
Love of nature	**1**
Total	**29**

DISCUSSION

In the study, the effect of the activity-based 6-week application process in the environmental education course on the attitudes and behavior levels of the students towards the environmental problems was determined. In the qualitative dimension of the study, the pre-attitude mean scores and the post-attitude mean scores in the receiving, responding, valuing and characterization subscales of the environmental problems attitude scale and in the overall scale significantly differentiated in favor of the post-attitude. These results demonstrated that the activities performed in the environmental education course affected the attitudes of the students towards the environmental problems positively. Similarly, Boca and Saraçlı (2019) concluded that the practical applications performed on the environmental problems faced during daily life in the environmental education course have positive effects on the attitudes of the university students' towards the environmental problems. It was determined that the pre-test and post-test mean scores of the students in the perception, set up, guiding, converting into skills, customizing, and creating subscales of the environmental problems behavior scale and in the overall scale significantly differentiated in favor of post-test. These results demonstrated that the activities performed in the environmental education course affected the behaviors of the students towards the environmental problems positively. Aslan and Bulut (2021) concluded that activity-based education affected the environment-related behaviors of the students positively. In their studies, Ayaz et al. (2021) concluded that the activity-based environmental education course affected the university students positively in affective and behavioral terms within the context of the formation of their environmental identity.

In the analysis of the data obtained in the qualitative dimension of the study, it was observed that the students

emphasized that they had fun and got excited in the activities during the course. Also, the students stated positive opinions that these activities led to informative, cooperative work and research, reinforced the sense of sharing and raised their awareness. Besides positive opinions, some of the students stated negative opinions that the process was stressful and tiring and it required preparation and it was time-consuming. The students stated that they had productive and permanent learning as they participated more actively in the course by converting the theoretical information they learnt into practice by means of the activities they performed in the environmental education course. Also, the students stated that they developed different points of view and critical thinking skills by means of the activities they performed cooperatively within the process. In addition to the cognitive acquisitions related to the course, the students emphasized in terms of the affective acquisitions that their love, interest and responsibility related to the course increased as the course was entertaining. Similarly, Zamir (2020) stated that the students acquired different points of view to understand the content and solve the problems that may occur during the activities with activity-based learning. Albadı (2019) concluded that activity-based learning had a positive effect on the success of the students, it has made the learning environment interesting and increased the sense of responsibility. Geçit and Şeyihoğlu (2012) reached some negative results that some of the students found the process of the environmental education, performed based on activities as time-consuming and tiring. Finally, the students emphasized that they questioned their own behaviors, causing environmental problems, by means of the activities and they gained awareness to prevent this situation. They stated that their awareness was not enough on its own and they acted with sensitivity and sense of responsibility in raising the other people's awareness as in a butterfly's effect. They stated that their love of nature increased. Similarly, Ayaz et al. (2021) concluded that the university students stated that they both learnt permanently and by entertaining in the environmental education course performed based on activities and their awareness for the environment was raised. In order to keep the motivation of the students high in the activities to be used in environmental education, these activities should be well designed considering the pedagogical aspect (Kalogiannakis and Papadakis, 2017).

CONCLUSION

This study was conducted for the purpose of determining the effect of the activities performed within the scope of the environmental education course on the attitude and behavior levels of the students of the child development program concerning environmental problems. When the qualitative results of the study were examined, it was determined that the attitude and behavior levels of the students towards the environmental problems increased with the activity-based applications. In the examination of the qualitative results, the students emphasized the activities performed as exciting and entertaining and some of the students emphasized the stress they experienced related to the process. The students stated their cognitive and affective acquisitions related to the effects of the activities on the course. They emphasized that they made the things they learnt permanently by reinforcement as they can convert their theoretical knowledge into activities by means of active participation. Therefore, they emphasized that they followed the course with fun and interest. Finally, the students stated they recognized the situations they caused on the environmental problems by means of the activity-based applications and they had acquisitions for correcting these negative situations. More comprehensive results can be obtained with different measurement tools by diversifying and expanding the study group of the research.

REFERENCES

Albadı, A. (**2019**). The impact of activity based learning on students' achievement. A study among 12 grade science and environment students in a public school in Oman. Master's thesis, The British University in Dubai.

Ampartzaki, M., Kalogiannakis, M., and Papadakis, S. (**2021**). Deepening our knowledge about sustainability education in the early years: lessons from a water project. Education Sciences, 11(6): 251.

Ardoin, N. M., Bowers, A. W., and Gaillarde, E. (**2020**). Environmental education outcomes for conservation: a systematic review. Biological Conservation, 241.

Aslan, S., and **Bulut**, B. (**2021**). 6. sınıf sosyal bilgiler dersinde etkinlik temelli öğretimin kullanılmasının öğrencilerin çevresel okuryazarlık düzeylerine etkisi. Turkish Journal of Educational Studies, 8(1): 85-108.

Ayaz, E., Doruk, O., and Sarıkaya, R. (**2021**). Effect of activity-based environmental education on the environmental identities of classroom pre-service primary school teachers. Revıew of Internatıonal Geographıcal Educatıon, 11(1): 277-295.

Boca, G. D., and **Saraçlı**, S. (**2019**). Environmental education and student's perception, for sustainability. Sustainability, 11(6): 1-18.

Büyüköztürk, Ş. (**2007**). Sosyal bilimler için veri analizi el kitabı (8. Baskı). Ankara, Pegem A Yayıncılık.

Büyüköztürk, Ş., Çokluk, O., and Köklü, N. (**2019**). Sosyal Bilimler İçin İstatistik (21. Baskı). Ankara, Pegem A Yayıncılık.

Büyüköztürk, Ş., Kılıç-Çakmak, E., Akgün, Ö. A., Karadeniz, Ş., and Demirel, F. (**2012**). Bilimsel araştırma yöntemleri (12. Baskı). Ankara, Pegem Akademi.

Carbonneau, K. J., and **Marley**, S. C. (**2013**). Activity-based learning strategies. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 282–284). Routledge/Taylor & Francis Group.

Duman, B. (**2008**). Eğitimde çağdaş yaklaşımlar. Gürbüz Ocak (Editör). Öğretim ilke ve yöntemleri. Ankara, Pegem Akademi, s.277-352.

Ersoy, A.F. (**2016**). Fenomenoloji. Ahmet Saban & Ali Ersoy (Editör). *Eğitimde nitel araştırma desenleri*. Ankara, Anı Yayıncılık, s. 51-105.

Geçit, Y., and **Şeyihoğlu**, A. (**2012**). The Opınıons of Classroom Teacher Candıdates "On Actıvıty-Based Envıronmental Educatıon".

NWSA, 7(1).
Gliner, J. A., Morgan, G. A., and Leech, N. L. (**2015**). *Uygulamada araştırma yöntemleri: desen ve analizi bütünleştiren yaklaşım* (Çev. Ed.: Selahattin Turan). Ankara: Nobel Yayın Dağıtım.
Guerra, V. D. (**2018**). A proposal of a balanced scorecard for an environmental education program at universities. Journal of Cleaner Production,172: 1674-1690.
Kalogiannakis, M., and **Papadakis**, S. T. (**2017**). Combining mobile technologies in environmental education: A Greek case study. International Journal of Mobile Learning and Organisation, 11(2): 108-130.
Kılınç, H. H. (**2018**). Çağdaş öğretme-öğrenme yaklaşımları-1. Mehmet Nuri Gömleksiz (Editör*). Öğretim ilke ve yöntemleri*. Ankara, Asos Yayınları, s.185-217.
Merriam, S. B. (**2015**). Nitel araştırma: desen ve uygulama için bir rehber. (Selahattin Turan, Çev.) Ankara: Nobel Yayıncılık (Orijinal eserin yayın tarihi 2009).
Petousi, V., and **Sifaki**, E. (**2020**). Contextualizing harm in the framework of research misconduct. Findings from a discourse analysis of scientific publications. International Journal of Sustainable Development, 23(3/4): 149-174.
Sönmez, V. (**2009**). Program geliştirmede öğretmen elkitabı (15. Baskı). Ankara, Anı Yayıncılık.
Sönmez, V., and **Alacapınar**, F. G. (**2014**). Örneklendirilmiş bilimsel araştırma yöntemleri (genişletilmiş 3. baskı). Ankara, Anı Yayıncılık.
Suydam, M. N., and **Higgins**, J. L. (**1977**). Activity-based learning in elementary school mathematics: recommendations from research. Retrieved on 08.07.2021 from https://eric.ed.gov/?id=ED144840.
Zamir, W. (**2020**). Comparative analysis of activity based learning system vs lecture method on students' performance. Thesis for: B.Ed. Secondary, Virtual University of Pakistan.

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