

## **Effect of Cooperative Learning Approach on Recycling Sensitiveness of Preservice Classroom Teachers**

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**Abstract:-** To prevent today's increasing environmental problems is only possible with an effective environment education. Teachers, in turn preservice teachers have great responsibility to enable an effective environment education. Therefore, this research aimed to determine the effect of cooperative learning method which is implemented in Environment Education course on preservice classroom teachers' sensitiveness about recycling. One group pretest-posttest experimental design was used for this aim. A total of 100 2<sup>nd</sup> grade students enrolling Classroom Teaching Departments and attending Environment Education course in 2016-2017 academic year, fall semester participated in the research. As a data collection tool, "Sensitivity Survey of Environmental Recycling" was used. The reliability coefficient was calculated as .849. In order to test whether the data was normally distributed or not, Kolmogorov-Smirnov analysis was used and results showed the data was normally distributed. In this research, paired samples t-test, independent samples t-test and one way ANOVA were used as parametric tests. There was a statistically significant difference between the mean scores of pretest and posttest of preservice classroom teachers on behalf of post-test. Comparing the posttests' scores according to gender, there was a significant difference on behalf of girls, and there was no difference according to age. The sensitiveness of preservice classroom teachers about recycling did not differ according to high school type and residential area in which they live the longest.

**Keywords -** *Cooperative learning, Preservice classroom teachers, Environment education, recycling, Sensitiveness*

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### **I. INTRODUCTION**

Rapid increase in population, unplanned urbanization, corruption of wild life, global warming, hole in ozone layer, greenhouse effect, nuclear pollution, decrease in green areas, extinction of plant and animal species are among the main environmental problems today. Particularly, as a natural consequence of rapid and unplanned urbanization, one of the environmental problems which has become an important issue in recent years and has threaten the human future is the problem of solid waste, and this problem is increasing day by day (Mert, 2006; Kışoğlu and Yıldırım, 2015). Wastes such as glass, plastic, paper and metal stay in nature many years and this gives rise to visual pollution, environmental pollution and various illnesses. Apart from this, an economical loss arises as a result of not separating these materials at home and institutions, and not collecting them in order to reutilize (Mert, 2006; Özbay, 2010). To prevent this loss, solid wastes are required to be collected, stored and harmlessly reutilized as an effective, productive and ordered way (Mert, 2006).

Recycling is a reutilization of materials such as plastic, glass, metal, paper and carton in solid wastes that undergo a physical, chemical and biological process, and a secondary product and raw material are obtained from them (Yücel, 1997). Materials such as metal, glass, plastic and paper stay in nature very long time without corruption, and they are the top consumed but easily recycled materials. Moreover, the amount of energy consumed during the recycling process is much more less than the amount of energy consumed during obtaining a product from a raw material. Owing to the recycling of these materials, the need for raw material decreases and natural resources will be protected; extra energy consumption will be prevented by means of reutilization of recycling materials as raw materials, and solid waste mass decreases (Keser, 2008; Özbay, 2010).

Environmental problems can not be solved only by technology and regulations but the changes in behaviors of individuals (Erten, 2004). Therefore, it is required to separate the recyclable packaging wastes at home, offices and schools and for municipalities to collect them due to prevent the environmental pollution, and moreover individuals should be willing for recycling (Bakar and Aydınli, 2012). In this context, individuals have important duties and responsibilities for decreasing the waste production, separating the wastes, classifying and collecting the solid wastes according to their properties and sending them to recycling. At home, packaging wastes such as glass, paper, carton, metal and plastic and food waste should be collected separately. Batteries should not be regarded as a waste and be collected in a separate place. Recycling the solid wastes by collecting them consciously not only decreases the environmental pollution but also contribute to economy (Çevre Bakanlığı, 1995; Pamukçu, 1995; Karatekin, 2013).

To train conscious, sensitive and aware individuals who have these duties and responsibilities, and to construct positive attitudes and values towards environment in society can only be possible by environment education (Erten, 2004; Karatekin, 2013). This education provides a positive attitude and behavior pattern towards the protection of environment for individuals' consumption habits and sustainable usage of natural resources; besides it contributes to have gain knowledge and awareness about the protection of environment. A planned and continuous perspective of environment education from primary school to college makes an individual more sensitive and conscious. Moreover, it gains him/her perpetual behaviors without destroying the natural balance while s/he is making benefit from the environment (Çolakoğlu, 2010).

With reference to the statement "as the twig is bent, so is the tree inclined", to construct experiences by creating an awareness for children in early ages and increase their sensitiveness might be possible by recycling which is an important basement of environment education (Şallı, et al., 2013). Considering the significance of teachers who play an active role for an effective environment education and who create a sensitiveness and positive attitudes towards the protection of environment; it is extremely important for a teacher to have enough knowledge, positive attitude and behavior about the issue (Kahyaoğlu and Kaya, 2012).

Examining the recent body of research about environment, there are many one of which developed environmental sensitiveness scale (Metzger and McEwen, 1999); made a meta-analysis of scales developed on environmental paradigms in the late 30 years (Hawcroft and Milfont, 2010); found positive effects of nature documentaries on students' environmental sensitiveness (Barbas, Paraskevopoulos and Stamou, 2009), studied the views of students and teachers on aims of the environment science course (Blatt, 2015); presented the views of academicians on environmental sustainability in higher education (Christie, Miller, Cooke and White, 2015); reviewed the environmental curriculum in new era (Stern, Powell and Hill, 2014); and determined the environmental attitudes of preservice teachers (Watson and Halse, 2005).

In a research which examined the cooperative learning approach in environment education course, quite positive results were reached such that jigsaw technique increases the academic achievement, develops the thinking skills, draws attention to subject matter, develops the quality and frequency of communication among both group mates and the teacher, supports a democratic relationship with the teacher, encourages a preparation for the course, and has a positive impact on self-expression of students (Gürbüz, Çakmak and Derman, 2012). Furthermore, station technique is seemed to be funny, attractive, instructive, increases the creativity and imagination, helps cooperative study, provides a rapid and practical thinking and helps to learn from the others' perspectives (Genç, 2013); jigsaw technique has a positive effect on preservice teachers' academic achievement, attitudes toward environmental problems and permanence on learning (Uyanık, 2016).

In literature on environment education and recycling which was conducted with preservice teachers, preservice teachers thought recycling as an universal activity, and stated that recycling should be considered as an individual's responsibility to protect the environmental pollution, recycling boxes should be used and industry sector have the responsibility of using recycling materials (Yücel and Morgil, 1998; Kahyaoğlu and Kaya, 2012; Kocalar and Balcı, 2013). On the other hand, according to the results of some research, a part of preservice teachers think that there is no effort on separating the wastes for recycling (Yıldırım, Bacanak and Özsoy, 2012); they have a low awareness level of solid waste and recycling (Karatekin, 2014); and they don't show enough sensitiveness for recycling even though they have enough knowledge about what recycling is and which materials are recycled (Demircioğlu, Demircioğlu and Yadigaroglu, 2015).

Examining the literature as a whole and in a detailed way, preservice teachers are aware of the importance and requirements of recycling however they don't show enough responsibility to be sensitive for this issue. Considering the importance of education on training sensitive individuals about recycling, the significance of developing the sensitiveness of preservice classroom teachers about recycling who train students becomes required. In this context, it becomes also important to make implementations to construct an awareness and sensitiveness for environment and recycling in learning environment of preservice classroom teachers.

In this research it is aimed to determine the effect of cooperative learning method implemented in Environment Education course on 2nd grade preservice classroom teachers' sensitiveness about recycling. Moreover, the sensitiveness of preservice classroom teachers on recycling is examined according to their demographics.

## **II. METHODOLOGY**

### **1.1. Research Model**

One group pretest-posttest experimental design was used in the research. In this design, the effect of experimental process is tested by a study on one group. The assessments of subjects in terms of dependent variable are achieved using same assessment tools and same subjects via pretest before the experiment and posttest after the experiment (Büyüköztürk, et al., 2012).

### **1.2. Study Group**

The universe of the study is the students attending Classroom Teaching Department of Faculty of Education in Pamukkale University in fall semester of 2016-2017 academic years. The sample of the study consists of 100 2nd grade students enrolling Environment Education course.

Of the participants, 75 of them were girls (75%) and 25 of them were male (25%); with ages of 18 (39%), 19 and above (61%). Participants graduated from Anatolian High School (50%), Anatolian Teacher High School (15%), High School (15%) and other types of high schools such as science high school, technical high school etc.- (20%). They indicated their residential area in which they live the longest as villages (15%), town (7%), county (34%), city (14%) and metropolis (30%).

**1.3. Data Collection Tool**

“Environmental Recycling Sensitiveness Scale” developed by Aksakal (2013) was used in the study. As a 34 item scale, it has positive and negative items ranging in a 5 likert type. The negative items are 7, 14, 17, 18, 19 and 32; the rests are positive items. The reliability coefficient of the scale is .72.

In data collection process, first of all, all students were informed about the implementation of cooperative learning method in Environment Education course. Secondly, students are classified in nine groups and subjects about the environment (air, water, earth, radioactive, sight, noise pollution, greenhouse effect, global warming, acid rains, recycling, and reutilizations of waste, alternative energy resources, environmental sensitiveness, and research on environmental sensitiveness) were shared among the groups. Data collection tool was implemented to the volunteered participants before and after the experiment.

**2.4. Data Analysis**

Positive items in the scale were ranged from 5 (totally agree) to 1 (totally disagree); negative items were ranges vice versa. The reliability of the scale was calculated as .849. Kolmogorov-Smirnov analysis was used in order to understand whether the data was normally distributed and the results showed a normal distribution ( $Z= 0,475$ ;  $p>0,05$ ). Paired samples t-test, Independent samples t-test and One-Way ANOVA were used for the analysis.

**III. FINDINGS**

Table 1 displays the findings of Paired Samples t-Test implemented to determine the recycling sensitiveness of preservice classroom teachers before and after Environment Course in which cooperative learning method was implemented.

**Table 1. Pretest and Posttest Scores from Recycling Sensitiveness Scale**

Variable	Category	N	$\bar{X}$	Sd	t	p
Recycling Sensitiveness	PreTest	100	3,5074	,41152	-3,077	,003*
	PostTest	100	3,6759	,40204		

\*p<0,05

There is a statistical difference between the pretest and posttest scores of preservice teachers from Recycling Sensitiveness Scale ( $t= -3,077$ ;  $p< 0,05$ ). The posttest mean scores of preservice classroom teachers ( $= 3,68$ ) is pretty much higher than the pretest mean scores ( $= 3,51$ ).

The findings of Independent Samples t-Test made to determine whether the recycling sensitiveness of preservice classroom teachers significantly differ according to their gender and ages are shown in Table 2.

**Table 2. Independent Samples t-Test Showing Whether Recycling Sensitiveness Scale Scores Differ According to Gender and Age**

Variable	Category	N	$\bar{X}$	Sd	t	p
Gender	Female	75	3,75	,370	3,266	,002*
	Male	25	3,46	,423		
Age	18	39	3,6817	,46772	,116	,908
	19 and above	61	3,6721	,35792		

\*p<0.05

According to the analysis, there is a statistically significant difference of preservice teachers’ recycling sensitiveness in terms of their gender ( $t= 3,266$ ;  $p< 0,05$ ). Examining the mean scores, females get higher scores ( $= 3,75$ ) than males ( $= 3,46$ ). There is no significant difference of preservice teachers’ recycling sensitiveness in terms of their age ( $t= 3,46$ ;  $p> 0,05$ ).

Table 3 displays the findings of One Way ANOVA made to determine whether the recycling sensitiveness of preservice classroom teachers significantly differ according to high school type graduated and the residential area where they live the longest.

**Table 3. One Way ANOVA Showing Whether Recycling Sensitiveness Scale Scores Differ According to High School Type and Residential Area**

	Source of Variance	Sum of Squares	df	Mean Squares	F	P
High School Type	Between Groups	,108	3	,036	,218	,883*
	Within Groups	15,893	96	,166		
	Total	16,002	99			
Residential Area	Between Groups	,595	4	,149	,917	,457*
	Within Groups	15,407	95	,162		
	Total	16,002	99			

\*  $p > 0,05$

The findings show no significant differences of preservice classroom teachers' recycling sensitiveness in terms of high school type graduated and residential area where they live the longest (F<sub>highschool</sub>=0,218;  $p > 0,05$ ); F<sub>resarea</sub>=0,917;  $p > 0,05$ ).

#### IV. CONCLUSION, DISCUSSION AND SUGGESTION

In this research, which studied the effect of cooperative learning in Environment Course on recycling sensitiveness of preservice classroom teachers, it has been also studied whether the recycling sensitiveness of preservice classroom teachers differ according to demographics variables. Analysis showed a positive change on the recycling sensitivity of 2nd grade preservice classroom teachers after the implementation of cooperative learning method in Environment Education course. These results are consistent with the related literature which examined the jigsaw and station techniques in Environment Education course and found that these techniques have a positive impact on the attitudes of preservice teachers towards environmental problems (Gürbüz, Çakmak and Derman, 2012; Genç, 2013; Uyanık, 2016). Female preservice teachers are found to be more sensitive to recycling than are males. Although this difference is thought to be because of the gap in the numbers of two genders, there is some research found a significant difference in terms of females about environmental sensitiveness (Çabuk and Karacaoğlu, 2003; Şama, 2003; Çimen, Yılmaz and Çimen, 2011); nevertheless there are some others which showed no significant difference according to gender in terms of environmental sensitiveness (Kahyaoglu, Daban and Yangın, 2008; Server and Yalçinkaya, 2012; Ercengiz, Keçeci Kurt and Polat, 2014). There is no significant difference between the recycling sensitiveness of classroom preservice teachers according to their ages, high school type graduated and residential area where they live the longest. The reason why preservice teachers' sensitiveness do not differ according to their ages might be that they are in similar ages. Alongside, there are similar studies that reached the same results (Çabuk and Karacaoğlu, 2003; Ercengiz, Keçeci Kurt and Polat, 2014). Related literature support the findings about high school type graduated (Kayhaoğlu, Daban and Yangın, 2008). Moreover, this might be because of that there are not any various implementations in different types of high schools about the environmental and recycling sensitiveness of students. There is some research suggesting that there is no significant difference of preservice teachers' environmental sensitiveness in terms of residential area where they live the longest (Ercengiz, Keçeci Kurt and Polat, 2014), besides there are some others which stated that the attitude levels of preservice teachers who live in metropolis the longest are higher than the ones who live in smaller places (Şama, 2003).

At this point, what important is to determine the reasons of these results and qualitative studies are taken into consideration in this context.

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