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## Research Article

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# Recycling as a Value in Primary and Secondary Curriculums\*

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## Abstract

In recent years, the main framework of the curriculum developed by the Ministry of Education is the concepts, skills, attitudes and values. However, the content of the programs shows that the activities and attainments related to values education take place in different programs in different dimensions and qualities. On the other hand, values education is important in the development of the educational process along with feelings, attitudes and behaviors. Textbooks and in-class activities to be embodied in values education is the degree allowed by the curriculum of the course. The aim of this study is to determine how the concept of recycling, which has recently gained considerable importance in terms of sustainability of our planet, is included as a value in the Science and Technology, Life Sciences and Social Sciences course curriculum (2017) of the Ministry of National Education. The research was carried out with a document review of qualitative research methods and descriptive content analysis and data were collected for the related curriculums. According to the results, most of the attainments in the above mentioned primary and secondary education programs are not intended to recycle as a value. Therefore, it is recommended that adequate and practical acquisitions should be included in the content of the programs when the acquisition size is taken into consideration. Furthermore, it is suggested that the return to primary and secondary schools should be included as a separate value in the recycling rates of our country, given the level of its presence in accordance with the European countries.

## Keywords

Recycling, Values and Attitudes, Primary and Elementary School Curriculums, Turkey.

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In the elimination of consumption wastes, primitive storage and incineration methods were used which led to air and soil pollution until the beginning of the 20th century. The new environmental problems caused by these methods were subsequently realized, and the basis of recycling was laid upon by considering the increase in people's consumption and consumption demand (Alboğa, 2013; Çelik, 2011). According to Avan (2011), recycling is the process of converting non-recyclable wastes after consumption into raw materials through various processes. According to Keser (2008), after using glass, metal, plastic and paper/cardboard, it is called recycling process by passing back materials through various physical and chemical processes to be put into production process as the second raw material or converting them into new products. According to Yaman (2007), recycling is the process of obtaining secondary raw materials through the physical and chemical processes of the solid wastes produced; reuse is the repeated use of solid wastes until they are collected and cleaned and completed their economic life.

It is important to use the wastes repeatedly. Because, while these wastes are produced from the world's resources, the limit of the natural resources we use is decreasing every year. As a matter of fact, with the data provided by the international research organization "Global Footprint Network", the date of limit exceeded is determined in the world every year. Earth Overshoot Day (EOD) is the day when resources produced by our planet in one year are consumed by humans. For the year 2018 is set to "Earth Overshoot Day" 1 August, while the date for 2017 August 2, 2016 August 8, 2015 for the year, August 19, 2014 to the 20th of August for the day and go back to the year 2000 when a further date has been designated as the month of September (World Wildlife Fund, 2016; World Wildlife Fund, and 2017). Since we consume the resources we need to consume in 12 months, we have taken four months of resources from the next year and we have been stealing from future generations (Özbakir Umut, Topuz and Nurtanış Velioğlu, 2015).

Therefore, to reduce the amount of waste in the world, 3R approach is widely used in order to establish waste management on solid foundations. The first priority in the waste management hierarchy, which is formulated as 3R in the form of Reduce, Reuse and Recycle, is to prevent waste generation. Because the safest, most economical, easiest and simplest way to prevent waste generation is this step (Reduce). In cases where waste generation cannot be prevented, there is a step of creating a product by reusing the wastes (Reuse). If waste is not reusable, or if it is not possible to obtain a new product from the waste, the waste is technically recycled (Recycle).

Natural resources are being depleted rapidly in developing countries such as Turkey, and the sustainable future at risk, and the amount of solid waste is increasing rapidly. Recycling has become a way of life in developed countries, unfortunately it is still not widespread in our country (Tekkaya, Kılıç and Şahin, 2011). While the European Union recycling average was 39% in the European Environment Agency (2013) data for the European countries in 2012, Turkey's recycling rate was set to 1% (See Figure 1). This means that the issue of recycling in our country has not gained enough importance yet. However, the importance of recycling is important both in terms of saving natural

resources, reducing the amount of waste and preventing environmental pollution as well as the country's economy.

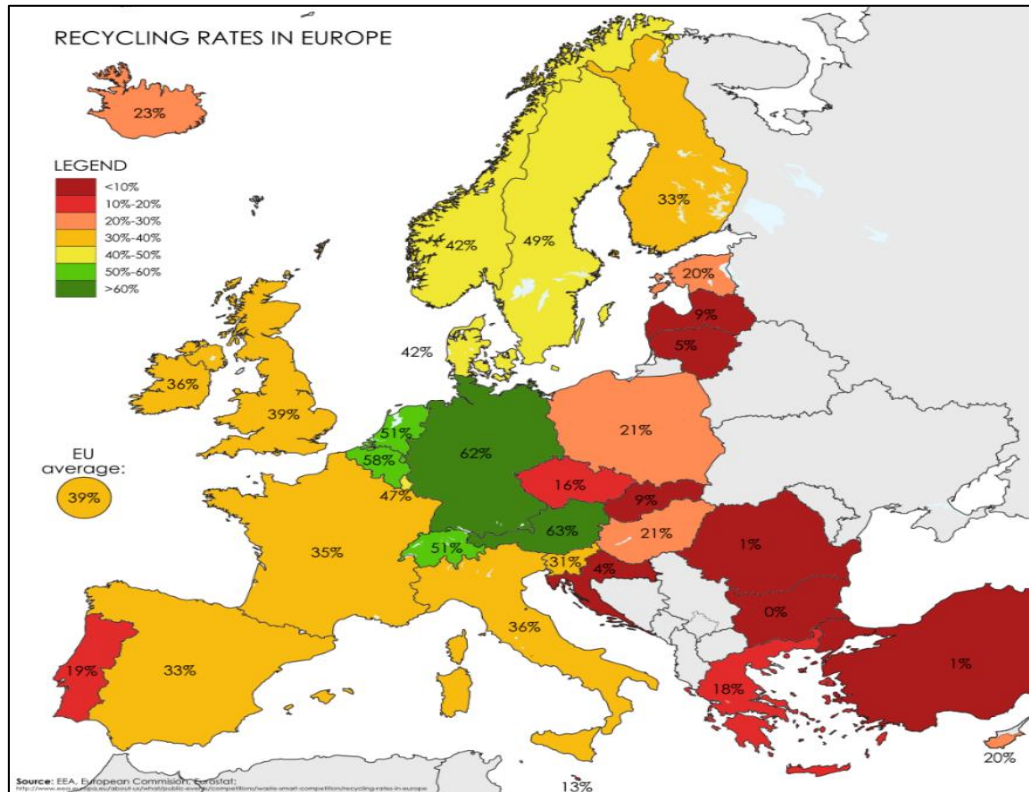


Figure 1. Map of recycling rates of European countries in 2012 (European Environment Agency, 2013).

Therefore, the national recycling strategy document and action plan prepared by the Ministry of Science, Industry and technology for the first time in our country was established. The aim of the action plan is to provide a culture of production and consumption that respects the environment and people, uses resources effectively and becomes one of the indispensable parts of recycling. Five targets have been set for this purpose. These five targets;

- To create awareness of recycling in all segments of society,
- To develop the relevant legislation for recycling,
- To create the necessary infrastructure for the efficient recycling of waste,
- Provide financial support for recycling,
- It is to establish an effective inspection system by recording waste production.

Training of trainers on the first objective of the action plan is urgent and necessary in order to educate people who will be trained on various platforms related to recycling. Each institution and organization should develop programs in this area according to their business and responsibilities. (T.C. Ministry of Science Industry and Technology, 2015).

With the expression that recycling education is “urgent and necessary” in the action plan, the need for training on recycling is dramatically stated.

The idea of solving environmental problems are not “how to produce?” it must be “How to consume?” (Çabuk, Nakıboğlu ve Keleş, 2008). Consumption inevitably brings with it the waste problem. The way to reduce these problems and environmental problems is through the transformation of environmental education into environmental awareness. As individuals who have attainments this awareness that we have to do the most important things are to reduce the waste production, to prefer recycled products and to separate the waste for recycling (Çimen and Yılmaz, 2012). Recycling is an important way to teach our children to gain environmental awareness and respect for their environment. The majority of environmental issues in primary and secondary schools are covered by Life Sciences, Science and Technology and Social Sciences courses. It is important that the teachers of these courses have a high level of awareness and knowledge on environmental and recycling issues. In this way, it may be easier for students to attainments awareness on environmental issues and to transform their knowledge into behavior. Teachers' values and behaviors affect students. Because, according to Sarı (2005), knowledge, Because according to Sarı (2005), knowledge, model acquisition and imitation are effective in learning the values. Individuals change their preferences, behaviors, beliefs and judgments with the information they have just learned. According to Balcı and Yanpar Yelken (2010), the values are “our judgment on what is good and what is bad”.

Cleanliness, respect, tolerance, honesty, love, kindness, etc. behaviors are appreciated. Because these behaviors are important values in society (Kunduroğlu, 2010). Values are important in choosing one behavior to another (Sarı, 2005). According to some researchers, values can change from society to society, as well as universal moral values (Akyol, 2010). In other words, universal values are not only important to the society in which we live, but also to all societies in the world (Gömleksiz and Cüro, 2011). Attitudes and values such as respect for human and environment, keeping the environment clean, protecting our natural resources and efficient use, displaying behaviors that will reduce global warming are universal. Values are not inherited; individuals are taught by seeing and living according to developmental characteristics. The child's cognitive, emotional, and psychomotor developmental characteristics in value-building work should be taken into consideration, and appropriate educational environment and good examples should be presented. Most importantly, student-centered and process-based applications are designed to internalize and transform student values into behavior. As a result, values are learned, acquired and transferred to the next generations, not to the genes (Sarı, 2005).

The main framework of the curriculum, which was updated by the Ministry of national education in 2017, is the concepts, skills, attitudes and values. Life sciences curriculum (primary school one, two and third grade), Science and Technology curriculum (primary school three, four and middle school five, six, seven, eighth grade) and Social Sciences curriculum (primary school four and middle school five, six, seven, eighth grade) are the renewed curriculum. While the values are taken into consideration in the general

objectives of the previous programs, they are added as part of the “values education” in the renewed programs in 2017. The main aim of this study is to determine how the concept of recycling which has gained considerable importance in terms of the sustainable future of our country and of our world has taken place in the education programs of the Ministry of National Education, Science and Technology, Life Sciences and Social Sciences (2017) as a value.

## Methodology

### Research Design

In this study, a document analysis method was used from the qualitative research approach because the programs were examined in order to determine how the attainments and objectives related to the recycling subject were structured and whether the recycling issue was included as a value in the Science and Technology, Life Science and Social Sciences Courses Curriculum (2017). In the document analysis method, resources related to research (books, journals, newspapers, letters, archives, etc.) are collected, coded and examined according to a specific system. Since document analysis is not interacted with individuals, the problems experienced in interviewing and observing are not only encountered but also more economical (Çepni, 2014; Metin, 2015).

### Data Collection and Analysis

These research data constitute curriculum of Science and Technology, Life Sciences and Social Sciences courses, which was put into effect by the Ministry of National Education in 2017. In this study, the aim of these training programs was to analyze the recycling subject in the context of values education, taking into consideration the objectives, attainments and explanations about the program. Since the current situation in the programs was revealed at the end of the analysis, descriptive content analysis technique was used in the analysis of the data.

## Findings

In the research, it was first tried to determine whether the concept of recycling was directly or indirectly related to the nature and environmental sensitivity issues within the general objectives of primary and secondary schools. The results of this analysis are shown in Table 1.

Table 1

*Distribution of Life Science, Science and Technology, Social Sciences Curriculum (2017) Purposes in terms of Recycling*

Curriculum	Curriculum Purposes				Total Number of Purposes in the Curriculum (f)
	Direct Purposes (f)	Direct Purposes (%)	Indirect Purposes (f)	Indirect Purposes (%)	
Life science	2	14.286	2	14.286	14

Science and Technology	3	30	1	10	10
Social Sciences	3	16.666	2	11.111	18

According to Table 1, two direct purposes and two indirect purposes for recycling, environment and nature were determined in 14 general purposes of the Life Sciences Curriculum (2017). While 10 general purposes are included in the Science and Technology Curriculum (2017), 3 of these general purposes are directly related to human-environment interaction, sustainable development, curiosity raising for nature and environment, and one of them is indirect. In the Social Sciences Curriculum (2017), in total 18 general purposes, three direct and two indirect purposes were determined to be sensitive to environment and nature, to use resources efficiently.

The values that are included in Life sciences, Science and Technology and Social Sciences Curriculum (2017) are given in Table 2. The values that are given in Table 2 are given in terms of recycling, environment and nature from the concepts related to education.

Table 2

*Recycling-Related Values in Life Science, Science and Technology, Social Sciences Curriculum (2017)*

<b>Curriculum</b>	<b>Values</b>
Life Science	Sensation (sensation to natural environment) Respect Affection Responsibility Patriotism
Science and Technology	UNSPECIFIED
Social Sciences	Sensation (sensation to natural environment) Respect Affection Responsibility Saving Patriotism

According to the data in Table 2, there is a sensation to natural environment under the value of sensitivity in the Life Sciences and Social Sciences Programs (2017). The saving value of the three programs was mentioned in the Social Sciences Program (2017). It has been determined that there is no table concerning the values that are intended to be attainments in the Science and Technology curriculum (2017), known as natural and Environmental Sciences, and that the expression “scientific, ethical and social values are emphasized in the science curriculum” has been found.

The attainments in the life sciences curriculum (2017) were examined in terms of recycling concept and the results were shown in Table 3.

Table 3  
*Recycling in the Life Science Teaching Program (2017)*

Class	Unit	Attainments
1	Life at Home (Unit 2)	Use resources in the home efficiently.
	Life in Nature (Unit 6)	It is sensitive to keeping the nature and the environment clean. Distinguishes the materials that can be recycled.
2	Life in our School (Unit 1)	It takes care when using school resources and items.
	Life at Home (Unit 2)	Research the contribution of saving home resources to the family budget.
	Life in Nature (Unit 6)	It contributes to the recycling of consumed substances. Explains measures against natural events and natural disasters.
3	Life in our School (Unit 1)	Make original suggestions for effective and efficient use of school resources. Make original suggestions for effective and efficient use of resources in the home.
	Life in Nature (Unit 6)	Gives examples of people's influence on natural elements close to their environment. Takes responsibility for protecting nature and environment. It gives examples of the contribution of recycling to itself and to the environment in which it lives.

As can be seen in Table 3, the first, second and Third Class Life Sciences Program (2017) provides efficient use of resources, recognition of wastes that can be separated for recycling, collection of wastes for recycling, recycling benefits and human impact on nature.

The achievements in the Science and Technology Education Curriculum (2017) are examined in terms of the concept of recycling and the results are given in Table 4.



Table 4  
*Recycling in Science and Technology Education Curriculum (2017)*

<b>Class</b>	<b>Unit</b>	<b>Attainments</b>
3	Journey into the World of Creatures (Unit 6) Electric Vehicles (Unit 7)	In order to protect the natural environment, researches offers solutions.  Discuss the environmental hazards of battery waste and what needs to be done in this regard.
4	Lighting and Sound Technologies (Unit 5)  Human and Environment (Unit 6)	Discuss the importance of the economical use of lighting tools in terms of family and country economy.  It takes care to be economically efficient in the use of resources. Resources such as water, food, electricity are mentioned.
5	Human and Environment (Unit 6)	Provides suggestions for resolving an environmental problem in its immediate surroundings or in our country. As a result of human activities, inferences about future environmental problems.
6	Not	Not
7	Pure Materials and Mixtures (Unit 4)  Interaction of Light with Matter (Unit 4)	Distinguishes the recyclable and non-convertible materials in domestic waste. Design project for the recycling of domestic solid and liquid waste. Questions recycling in terms of effective use of resources.  It takes care of waste control in its vicinity. Develops a project to deliver reusable items to those who need them. Determines the focal points of thin and thick-edged lenses. <i>It is mentioned that the glass wastes left in forest areas can create a fire risk.</i>

8	Energy Transformations and Environmental Science (Unit 4)	<p>It makes inferences about the causes of ozone layer thinning and its possible effects on living things.</p> <p>It offers alternative solutions for ozone layer thinning and preventing global warming.</p> <p>They are asked to express their visions of how environmental problems can have an impact on the future of the world through artistic means.</p> <p>Discuss the causes and possible consequences of global climate change.</p> <p>It takes care to be economically efficient in the use of resources.</p> <p>Design projects for the efficient use of resources.</p> <p>Explains the importance of separation of solid wastes for recycling.</p> <p>In the event that resources are not used efficiently, it provides solutions by specifying the problems that will be encountered in the future..</p>
	Electric Loads and Electrical Energy (Unit 7)	<p>Discuss the importance of conscious and economical use of electricity in terms of family and country economy.</p> <p>It takes care to use electricity in homes efficiently.</p>

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As shown in Table 4, in the Science and Technology Education Curriculum (2017), it was determined that the protection of the nature for third-year students and the damage to the environment of the battery wastes were the attainments. In the fourth grade, it was determined that the gains related to the efficient use of resources, reuse, and the importance of recycling were taken place. In the fifth grade, it has been determined that solutions for environmental problems were made to produce, and human impacts on nature and environment. In the seventh grade program, it was determined that the students have attained knowledge of recyclable household waste, waste control, reuse and fires caused by glass waste left to nature. At the eighth grade, the reasons for ozone layer depletion and human responsibility, the reasons for global warming and human tasks, the efficient use of resources and the project design aimed at recycling solid wastes were determined. In the sixth grade program, it was determined that there was no recovery for recycling.

The attainments in the Social Sciences Curriculum (2017) are examined in terms of the concept of recycling and the results are shown in Table 5.

Table 5  
*Recycling in the Social Sciences Curriculum (2017)*

Class	Unit	Attainments
4	People, Places and Surroundings (Unit 3)	Make necessary preparations for natural disasters.
	Production, Distribution and Consumption (Unit 5)	Demonstrate conscious consumer behavior as a responsible individual. Uses resources around without wasting.
5	People, Places and Surroundings (Unit 3)	Question the causes of environmental disasters and environmental problems. Explain the effects of natural disasters on community life.
	Production, Distribution and Consumption (Unit 5)	Develops new ideas based on production, distribution and consumption by cooperating. Uses his rights as a conscious consumer.
6	Production, Distribution and Consumption (Unit 5)	Relate the economic activities of our country with the resources. Analyzes the effects of unconscious consumption on living life.
7	Not	Not
8	Not	Not

According to the data in Table 5, in the fourth grade program of the Social Sciences Education Program (2017), it was determined that the attainments were made to be conscious consumers, to use resources efficiently and to be prepared for natural disasters. In the fifth grade, environmental problems and causes of disasters, production-distribution and consumption for the preparation of projects, conscious consumer rights in the use of the gains are taking place; in the sixth grade program, it was determined that the importance of country resources in terms of economy and the effects of unconscious resource consumption on living things, and the importance of renewable and non-renewable resources. On the other hand, there was no recovery in their fifth and eighth programs. The third-grade Life Science and Science and Technology programs (2017) were compared in terms of recycling concept and the findings were shown in Table 6.

Table 6  
*Recycling in Third Class Life Science and Science and Technology Curriculum (2017)*

Life Science	Science and Technology
Unit 1: Life in our School	Unit 1: Not
Unit 6: Life in Nature	Unit 6: Journey into the World of Creatures

As shown in Table 6, efficient and effective use of resources is processed in the first unit within the scope of Life Science course and recycling in the first unit in the Science and Technology course, resource usage and so on. It has been determined that there are no attainments in their subjects. In the sixth unit, it was determined that the students attained responsibility to protect the natural environment in both courses.

Science and Technology and Social Sciences courses programs have been examined in terms of the concept of recycling and the findings are shown in Table 7.

Table 7  
*Recycling in Science and Technology and Social Sciences Curriculum (2017)*

Class	Unit	Science and Technology	Social Sciences
4	3. Unit	Not	People, Places, and Environment
	5. Unit	Lighting and Sound Technologies	Production, Distribution and Consumption
	6. Unit	Human and Environment	Not
5	3. Unit	Not	People, Places, and Environment
	5. Unit	Not	Production, Distribution and Consumption
6	6. Unit	Human and Environment	Not
	5. Unit	Not	Production, Distribution and Consumption
7	4. Unit	Pure Substances and	Not
	5. Unit	Mixtures Interaction of Light with Matter	Not
8	6. Unit	Energy Transformations and Environmental Science	Not
	7. Unit	Electric Loads and Electrical Energy	Not

According to Table 7, the Science and Technology and Social Sciences Curriculum (2017) contains the concept of recycling at the same time in the fifth unit of the fourth grade only.

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## Conclusion and Discussion

In this study, it is aimed to determine how the concept of recycling, which has attained considerable importance in terms of sustainability of our planet, takes place as a value in the curriculum (2017) of the Ministry of National Education of Science and Technology, Life Sciences and Social Sciences. According to the results obtained from the research, the following results have been obtained:

In the Social Sciences Curriculum (2017), while 5 of the 18 general objectives are aimed at providing recycling; In the Science and Technology Education Program (2017); In the Life Science Education Program (2017), four of the 14 general objectives are aimed at providing recycling. Within the scope of the general objectives, the objectives of recycling, environment and nature for the general purposes are given in the Science and Technology Curriculum (2017), the second in the Life Sciences Curriculum (2017) and finally in the Social Sciences Curriculum (2017).

While the values and attitudes intended to be given to the students under the title of values education, the values and attitudes intended to be given to the students under the title of Life Sciences and Social Sciences Education Program (2017) were clearly stated, it was determined that the attitudes and values that will be given to the students under the title of The Buddha shows that the definition of values education in the Science and Technology Education Program can be improved.

It has been determined that the recycling-related gains of the Life Sciences Curriculum (2017) are spiral in the first, second and third grades. And recycling related to the efficient and conscious use of resources, nature and environment to keep clean and protect, recyclable wastes, the importance of recycling, nature events and natural disasters to be taken against measures about the attainments are included.

In the Social Sciences Curriculum (2017), the benefits of being conscious consumers, natural disasters, conscious and efficient use of resources, causes of disasters and environmental problems, effects of country resources on economy are given.

Protection of natural environment in the Science and Technology Education Program (2017), recycling of recyclable wastes such as batteries and glass to the environment when not separated for recycling, efficient use of resources, reuse, environmental problems in the near and far surroundings, recognition of recyclable materials in household waste, back the contribution of the transformation to the country and the family economy as well as the resources, and the gains on sustainable development, global warming and the causes of thinning of the ozone layer are included.

In the sixth grade of the Science and Technology Education Program (2017), in the seventh and eighth grades of the Social Sciences Education Program (2017), there was no attainment in order to bring students consciousness of recycling. For this reason, Science and Technology and Social Sciences Curriculum (2017) is not a spiral structure

in terms of recycling. The lack of Helix prevents the waste separation behavior gain and therefore environmental awareness of value formation for recycling in students.

According to the obtained results, it is determined that most of the recoveries in the primary and secondary school subject to the research are not intended to be recycled as a value.

Nevertheless, these courses have a high potential to teach students responsibility for both recycling and other issues. For example; Akengin, Sağlam, and Dilek (2002) reported that 85% of the students gave information about the environment in their research conducted by the fourth and fifth grade students in order to determine their thoughts about the Social Sciences course. Found that 50% stated that Social Sciences course was effective in protecting the environment. In addition, 44% of the students stated that they could not harm the environment and 65% stated that they learned their lessons and responsibilities.

In another study, Baysal and Samancı (2010) found that the values that the social studies curriculum aims to gain were used by the students in their research in order to determine the status of the students at the end of the fifth year as “I will be warning them with respect when I see someone who throws garbage on the ground”. Therefore, this study can be a positive example for students that recycling can be processed as a value in Social Sciences Curriculum (2017).

Evin and Kafadar (2004) investigated how national and universal values determined by experts are included in the Social Sciences Curriculum and Social Sciences course books. In the first level Social Sciences textbook and program, while focusing on national values, they found that the Social Sciences lesson and program in the second level gave weight to universal values. They have differentiated the rates of inclusion of value categories of programs and textbooks. Based on this study, it is revealed that recycling should be repositioned as a universal value, not a national value in the Social Sciences Curriculum and textbooks.

In a study conducted in Fidan (2009) in connection with the results of this study, he emphasized that programs should be arranged in a way to adopt the values and the adoption will be attainment with various activities. In addition, he stated that the teachers who will give the values education to the students did not receive the value education instruction in the faculties of Education.

In accordance with the results of this study, Kunduroğlu (2010) has included the value attainments of the sensory area in the science programs that have been applied since 2005 and no details about how these values will be given have been mentioned. Values are neglected in the science program.

According to the findings in this study, many of the attainments of the Science and Technology Curriculum can be addressed in the subject of recycling. On the other hand, Özmen, Er and Gürgil (2012) researched the perspectives of secondary school teachers on value and value education. The majority of teachers (84%) stated that they did not consider the Science and Technology course responsible for value education. One of the

main reasons for the emergence of this situation is that recycling is not considered as a value in the program objectives and contents of the Science and Technology Curriculum

In accordance with the results of this study again, Tanrıverdi (2009) stated in his study that the objectives and achievements of the objectives of primary education programs in terms of sustainable environmental education are not in the required quality and quantity; found that the concept of recycling is limited to a limited number of achievements. Saying that the environmental problem is universal, Tanrıverdi stated that environmental gains were always given at the local level and were not processed in a universal dimension. Therefore, the results of Tanrıverdi's study and the results of this study are compatible.

In the light of the results of this study, the following suggestions are made:

- In the content of the programs, it is suggested that the attainments related to recycling should be provided at sufficient level at each class level and more for application.
- In the sixth grade of Science and Technology Education Program (2017); in the seventh and eighth grades of the Social Sciences Curriculum (2017), recycling attainments should be included and the spiral structure of the programs should be reviewed.
- The objectives and acquisition dimension of the Science and Technology, Life Sciences and Social Sciences Curriculum (2017) should be synchronized in a manner appropriate to provide recycling as a value.
- Since it is determined that the values of the Science and Technology Education Curriculum (2017) are not written, the “values education” title should be revised and the values should be written clearly.
- Considering the height of the recycling rates in European countries and that the recycling rates in Turkey have not changed in years and remained at 1% for almost a decade, it is suggested that the recycling should be placed as an independent value in the curricula of the study.

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