

Evaluation of Environmental Learning Acquisitions in the Curriculum of Primary and Middle School Courses in Line with the Revised Bloom's Taxonomy^a

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Abstract

In this research, it was aimed to evaluate the environmental learning acquisitions in the curriculum of the primary and middle school courses in Turkey in compliance with the Revised Bloom's Taxonomy. In line with this purpose, qualitative research approaches were used in the research. Furthermore, the primary school education level curricula published in 2018 were examined using the document analysis in the research. The primary education curriculum examined in the research was analyzed with the content analysis method. When the learning acquisitions were analyzed in compliance with the grade level, it was obvious that there was an imbalance between the grade levels in terms of environmental-related learning acquisitions. When the curricula were evaluated in compliance with the Revised Bloom's Taxonomy, it was determined that the environmental learning acquisitions were distributed unevenly in compliance with the dimensions in the taxonomy.

Keywords

Curriculum
Revised Bloom's Taxonomy
Environmental Education

About Article

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İlkokul ve Ortaokul Derslerinin Öğretim Programlarında Yer Alan Çevreyle İlgili Kazanımların Yenilenmiş Bloom Taksonomisine göre Değerlendirilmesi

Özet

Bu araştırmada Türkiye'de ilkökul ve ortaokul düzeyinde verilen derslerin öğretim programlarında yer alan çevre ile ilgili kazanımların Yenilenmiş Bloom Taksonomisi'ne göre değerlendirilmesi amaçlanmıştır. Bu amaç doğrultusunda araştırmada nitel araştırma yaklaşımlarından faydalanılmıştır. Ayrıca araştırmada doküman analizi deseni kullanılarak 2018 yılında yayınlanan ilköğretim düzeyindeki öğretim programları incelenmiştir. Araştırmada incelenen ilköğretim öğretim programları içerik analizi yöntemi ile analiz edilmiştir. Kazanımlar, sınıf düzeyine göre incelendiğinde sınıf düzeyleri arasında çevre ile ilgili kazanımlar açısından bir dengesizliğin olduğu belirlenmiştir. Öğretim programları Yenilenmiş Bloom Taksonomisi'ne göre değerlendirildiğinde ise çevre ile ilgili kazanımların yine taksonomide yer alan boyutlara göre dengesiz bir dağılım gösterdiği belirlenmiştir.

Anahtar Kelimeler

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Introduction

In order to make life on earth sustainable, human beings must develop environmentally responsible behaviors. The way people can develop responsible behaviors towards the environment is through effective education. When we consider the second part of the 20th century, it is obvious that there is a serious awareness of the environment. Environmentally friendly organizations established in the mentioned years, international decisions taken, laws enacted and the increase in the importance given to environmental education support this statement.

The damages caused by human beings to the environment have gone beyond being individual or social (Topkaya & Şentürk, 2021) and have gained an international and global dimension. Many complex social-ecological situations such as climate changes, worldwide air and water pollution, ocean acidification, degradation of agricultural land and loss of biodiversity indicate that environmental conditions are deteriorating at an alarming rate (Barnosky & Hadly, 2016). The irresponsible consumption of the resources offered by nature, without taking into account sustainability, also gives rise to many problems that are likely to be experienced in the future (Sarıgöz, 2014; Selvi, Selvi, Güven Yıldırım & Köklükaya, 2015; Topkaya & Şentürk, 2021).

The environmental problems experienced today put down to the fact the need for a qualified environmental education. The critical level that environmental problems have reached has increased the need for an environmental education that raises environmental awareness and changes individual habits and behaviors that are harmful to the environment (Suárez-Perales et al., 2021) achieving the purpose of political, economic and technological solution proposals put forward to eliminate environmental problems and re-establishing the lost harmony between human and nature can be possible through environmental education (Sever & Yalçınkaya, 2018). Since the knowledge and attitudes of the individuals who make up the society within the scope of the environment are decisive in the behaviors they exhibit towards the environment (Güven, 2014; Özcan & Arık, 2019; Uzun & Sağlam, 2006). Environmental education should encourage participation to increase the sustainability of human-nature interactions over time by developing attitudes, values, knowledge and skills in individuals to exhibit environmentally friendly behaviors (Monroe, 2003; Mastrángelo et al., 2019; Ardoin & Bowers, 2020). A qualified environmental education should have two dimensions: formal education within the school and non-formal education outside the school (Bossley, 2016). Environmental education should be included in formal education at all levels of compulsory education (García-González, Palencia & Ondoño, 2021). It should even be expanded to include undergraduate education. The actions of young people around the world to protect the environment provide hope for the sustainability of the natural environment. This makes curricula that concern children and young people, as well as lifelong learning, particularly important (van de Wetering et al., 2022).

The content of the education to be provided and the teaching and learning activities to be implemented in these educational activities can play a strategic role in increasing students' environmental knowledge (Bahrudin, Rohmat & Setiawan, 2018). With effective environmental education activities, students' awareness levels and positive attitudes towards the environment can be increased (Doğan, Çiçek & Saraç, 2018), and environmental awareness levels of students can also be increased (Doğan, Saraç & Çiçek, 2017) increasing people's knowledge about the environment and developing positive attitudes towards the

environment are important to increase the sustainability of the natural environment (Wu & Chen, 2014). In order to develop environmental skills, the activities carried out with students in the classroom should continue to be implemented outside the classroom, and the education given by focusing on environmental problems in these activities should be supported with practical activities (Zheng, Xu & Kong, 2017). However, it is known that teachers avoid the implementation of environmental education outside of school (Çiçek & Saraç, 2017; Dupuis & Jacobs, 2021). This situation leads to the conclusion that the education given at school should be improved qualitatively and with digital games (Sarigöz, 2019).

Environmental education has an importance that requires starting from an early age and continuing throughout life. From this point of view, it is clear that environmental education to be given in primary and middle schools will also form a basis for further education levels. At this point, the question of how much the curriculum of the courses taught in existing primary and middle schools can serve an effective environmental education comes to mind. The learning acquisitions of the program have a major role in achieving the objectives of the curriculum. Different taxonomies can be used to determine the compatibility of these learning acquisitions with the objectives of the curriculum (Birgin, 2016). Bloom's taxonomy is one of them. Anderson and Krathwohl (2010) rearranged Bloom's Taxonomy in two dimensions as cognitive process and knowledge. This taxonomy allows the regulation of learning-teaching processes as well as examining the learning acquisitions included in the curriculum (Tutkun et al., 2010). The fact that the learning acquisitions in the curricula used in Turkey consist of nouns and verb stems put forward the Revised Bloom's Taxonomy in their evaluation (Zorluoğlu, Şahintürk & Bağrıyanık, 2017). While the cognitive process dimension of the revised Bloom's Taxonomy is remembering - understanding - applying - analyzing - evaluating - creating, respectively, the knowledge dimension is factual-conceptual-procedural-metacognitive knowledge (Tutkun et al., 2015; Yıldız, 2015).

The change of negative behaviors towards the environment is a process that can be achieved with an appropriate environmental education (Ntanos et al., 2018). Researchers think that an effective environmental education should be designed in a way that will enable individuals to apply environmental knowledge, to implement what has been learned, and to analyze and evaluate environmental behaviors (Altınok, Tunç & Özcan; Topkaya & Doğan, 2019). From this point of view, it can be stated that curricula should be equipped with learning acquisitions at different levels in order to provide an effective environmental education.

The aim of this research is to evaluate the environmental learning outcomes of the primary and middle school courses in Turkey in the curricula implemented in 2018, qualitatively and quantitatively, in compliance with the Revised Bloom's Taxonomy. For this purpose, the learning acquisitions in the primary and middle school curricula put into practice in 2018 were discussed in terms of knowledge and cognitive process dimensions in line with the Revised Bloom's Taxonomy. This study differs in that it provides a holistic perspective to the programs in terms of the Revised Bloom Taxonomy. Addressing all the programs in force in Turkey in terms of environment puts the study in a different place. Thus, it is possible to look at the acquisitions in the programs holistically.

In line with this basic purpose, the determined sub-objectives of the research are;

1. In compliance with the Revised Bloom's Taxonomy, in which dimension are the environmental learning acquisitions in the primary school science of life curriculum?

2. In compliance with the Revised Bloom's Taxonomy, in which dimension are the environmental learning acquisitions in the primary and middle school science curriculum?
3. In compliance with the Revised Bloom's Taxonomy, in which dimension are the environmental learning acquisitions in the primary and middle school social studies curriculum?
4. In compliance with the Revised Bloom's Taxonomy, in which dimension are the environmental learning acquisitions in the curricula of other primary education courses?

Method

Model of the Research

This research is a qualitative research based on the examination of the Social Studies, Life Sciences, Science, Physical Education and Play, Human Rights, Citizenship and Democracy, Visual Arts, Our City, Religious Culture and Moral Knowledge, and Our Prophet's Life, which were implemented in primary and middle schools after being approved by the Ministry of National Education in 2018 and Traffic Safety curriculum, which was put into practice in 2021, within the scope of environmental education. The research data were obtained by examining the primary school curricula of 2018-2021 with the document analysis method. Documents have been an important element in qualitative research for many years. There are some document types; books, letters, magazines, diaries, maps, charts, statistics, constitution and regulations, legal texts, newspapers, photographs, memories, interviews, school records, health and public records, pictures, videos, messages, etc. (Kıral, 2020). At the stage of data collection, the steps of accessing the documents, checking the originality, understanding the documents and analyzing the data (Creswell, 2003) were followed in line with the nature of the document analysis.

Analysis of the Data

In order to examine the achievements in primary and secondary education programs in accordance with the Revised Bloom Taxonomy, first of all, the acquisitions were classified by the researchers according to the document analysis method. The opinions of two associate professors and two doctoral faculty members who worked on the environment and the curriculum were also taken, and they were also asked to analyze the learning acquisitions. For coding reliability, the experts conducted their analyzes at different times and in different places. It has been determined that a consensus has been reached on 90 acquisitions in the cognitive process and knowledge dimension of 110 learning acquisitions. On the other hand, a consensus was reached for 20 learning acquisitions for which no consensus was reached, by providing a discussion environment and taking the opinion of another expert (associate professor). With the majority of opinions of 5 expert academicians in total, final decisions were made in the knowledge and cognitive process dimension of the learning acquisitions.

Based on the formula, which is expressed as consensus among coders, which Miles and Huberman (1994) determined;

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$\Delta = C \div (C + A) \times 100$ can be calculated using the formula.

In the formula;

Δ : Reliability coefficient,

C: The number of topics or terms on which consensus was reached,

A: Refers to the number of topics or terms on which no consensus was reached..

In compliance with the coding control, which shows internal consistency, it is expected that the consensus of the coders should not be less than 70%.

Consensus among coders reached in this research is;

$$\Delta = (90/90+20) \times 100 = \%81,8.$$

A research reliability coefficient of 70% or more indicates that the research is reliable (Miles & Huberman, 1994; Patton, 2002). The research was limited to the 2018 primary and middle school curriculums of the Ministry of National Education.

The environmental learning acquisitions in the curriculum of the courses taught in primary and middle school grades 1-8 were analyzed by content analysis method. The acquisitions were coded with regard to knowledge and cognitive process dimension in compliance with the Revised Bloom's Taxonomy Matrix in Table 1.

Table 1: Revised Bloom Taxonomy Matrix

Knowledge Dimension	Cognitive Process Dimensions					
	1. Rem.	2. Und.	3. Appl.	4. Anly.	5. Eval.	6. Crea.
A. Factual K.	A 1	A 2	A 3	A 4	A 5	A 6
B. Conceptual K.	B 1	B 2	B 3	B 4	B 5	B 6
C. Procedural K.	C 1	C 2	C 3	C 4	C 5	C 6
D. Metacognitive K.	D 1	D 2	D 3	D 4	D 5	D 6

(Krathwohl, 2002; Anderson, 2005).

Findings

Environmental Education in Primary School Curriculum

In the primary school education level curricula being implemented in Turkey, environmental subjects are not covered in a separate course, but in courses such as science of life, science and technology, social studies, and our city. In line with the principle of gradualism in primary school curriculum, the subjects are arranged from simple to complex, from general to specific, from concrete to abstract, etc. Environmental subjects are presented in an interdisciplinary structure that organizes learning, in which knowledge, skills and values that are related to each other are handled as a whole. Lifelong learning is carried out in

formal and informal education environments with an interdisciplinary approach on environmental subjects. In the curricula prepared for grades 1-8, environmental learning acquisitions, unit/subject name, class and dimension are discussed below.

Environmental Education in Primary School Science of Life Course

Emphasis is placed on "being sensitive to nature and the environment" in the Special Objectives of the Science of Life Curriculum. Furthermore, with the Science of Life Curriculum, whose main goal is to provide primary school students with basic knowledge, skills and values in terms of individual, society and nature, students;

- Knows themselves and their environment.
- Develops the ability to use resources efficiently.
- Are sensitive to nature and the environment.

and such learning acquisitions are included (MEB, 2018a).

There are a total of 148 learning acquisitions belonging to the science of life course. 24 of these learning acquisitions are related to the environment and their percentage in total is 16.22%. Environmental subjects are covered in the "Life in our House" and "Life in our Country" and "Life in Nature" units of Science of Life Course. The distribution of the learning acquisitions in the curriculum in line with the Revised Bloom's Taxonomy is shown in Chart 1.

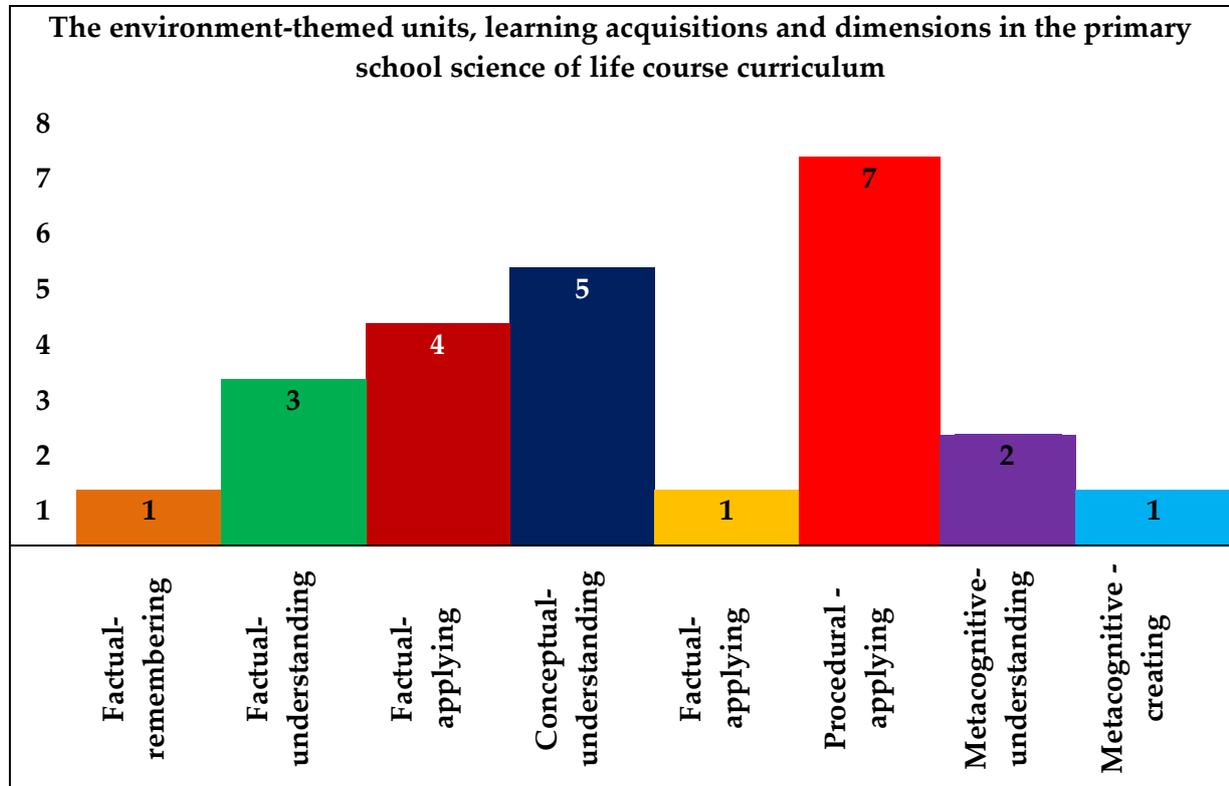


Chart 1. The environment-themed units, learning acquisitions and dimensions in the primary school science of life course curriculum

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When the graph 1 is examined, it is seen that the environmental learning acquisitions are in factual-remembering (A1) 1, factual-understanding (A2) 3, factual-applying (A3) 4, conceptual-understanding (B2) 5, conceptual- analyzing (B4) 1, procedural - applying (C3) 7, metacognitive- understanding (D2) 2, metacognitive - creating (D6) 1 dimensions.

2018 Science of Life Course Curriculum Unit and its learning acquisitions are shown in Table 2.

Table 2. Matching of environmental learning acquisitions in the primary school science of life course curriculum with Bloom Taxonomy

Grade	Unit/Topic	Environmental Learning Acquisitions	Dimension
	"Life in our House"	"Uses resources in the house efficiently."	C3
	"Life in our Country"	"Notices historical, natural and touristic locations in the immediate surroundings."	D2
1st grade		"Observes animals in the immediate vicinity."	A3
		"Observes plants in the immediate vicinity."	A3
		"Cares about to protect the animals and plants in the immediate vicinity."	A3
	"Life in Nature"	"Is sensitive to keeping nature and environment clean."	C3
		"Separates the materials that can be recycled."	B4
		"Searches seasons and their characteristics."	A3
2nd grade		"Understands the changes in nature in compliance with the seasons."	A2
		"Compares the conditions necessary for the survival of plants and animals."	B2
	"Life in Nature"	"Realizes the importance of growing plants and feeding animals."	B2
		"Gives examples of the effect of natural elements in the immediate vicinity on human life."	A2
		"Contributes to the recycling of consumed materials."	C3
		"Knows natural phenomena."	A1

	“Gives examples of natural disasters.”	A2	
	“Explains the precautions that can be taken against natural phenomena and natural disasters..”	B2	
	“Life in our House”	“Fulfills duties and responsibilities at home.”	C3
		“Makes original suggestions for the effective and efficient use of resources at home.”	D6
	“Life in our Country”	“Introduces the features of historical, natural and touristic places in the vicinity.”	C3
3rd grade		“Understands the significance of plants and animals for human life.”	D2
		“Researches the growing conditions of fruits and vegetables.”	C3
	“Life in Nature”	“Gives examples of the influence of people on natural elements in the immediate vicinity.”	B2
		“Takes responsibility for protecting nature and the environment.”	C3
	“Gives examples of the contribution of recycling to themselves and the environment they live in.”	B2	

When the science of life curriculum (MEB, 2018a) is examined, a total of 9 learning acquisitions in 3 different units (Life in Our Home, Life in Our Country, Life in Nature) in the 1st grade, 7 acquisitions in 1 unit (Life in Nature) in the 2nd grade, and a total of 8 learning acquisitions in 3 different units (Life in Our Home, Life in Our Country, Life in Nature) in the 3rd grade are directly related to the environment.

Environmental Education in Primary and Middle School Science Courses

The main objectives of the Science Course Curriculum, which aims to raise all individuals as science literate;

1. To provide basic information about astronomy, biology, physics, chemistry, earth and environmental sciences and science and engineering applications,
2. In the process of discovering nature and understanding the relationship between human and environment, adopting scientific process skills and scientific research approach and producing solutions to the problems encountered in these areas,
3. To realize the mutual interaction between the individual, the environment and society, to develop the awareness of sustainable development regarding society, economy and natural resources,

4. To arouse interest and curiosity about the events occurring in nature and its immediate surroundings, and to develop an attitude of interest towards them," and in this regard, there is emphasis on environmental education (MEB, 2018b).

There are a total of 305 learning acquisitions belonging to the science course. 55 of these learning acquisitions are related to the environment, and the total percentage among the learning acquisitions is 18,03%. The environment was emphasized in the subjects of "Living Things and Life", "Physical Phenomena", "Matter and Its Nature" and "Earth and Universe" of the science course. The distribution of the learning acquisitions in the curriculum in compliance with the Revised Bloom's Taxonomy is shown in Chart 2.

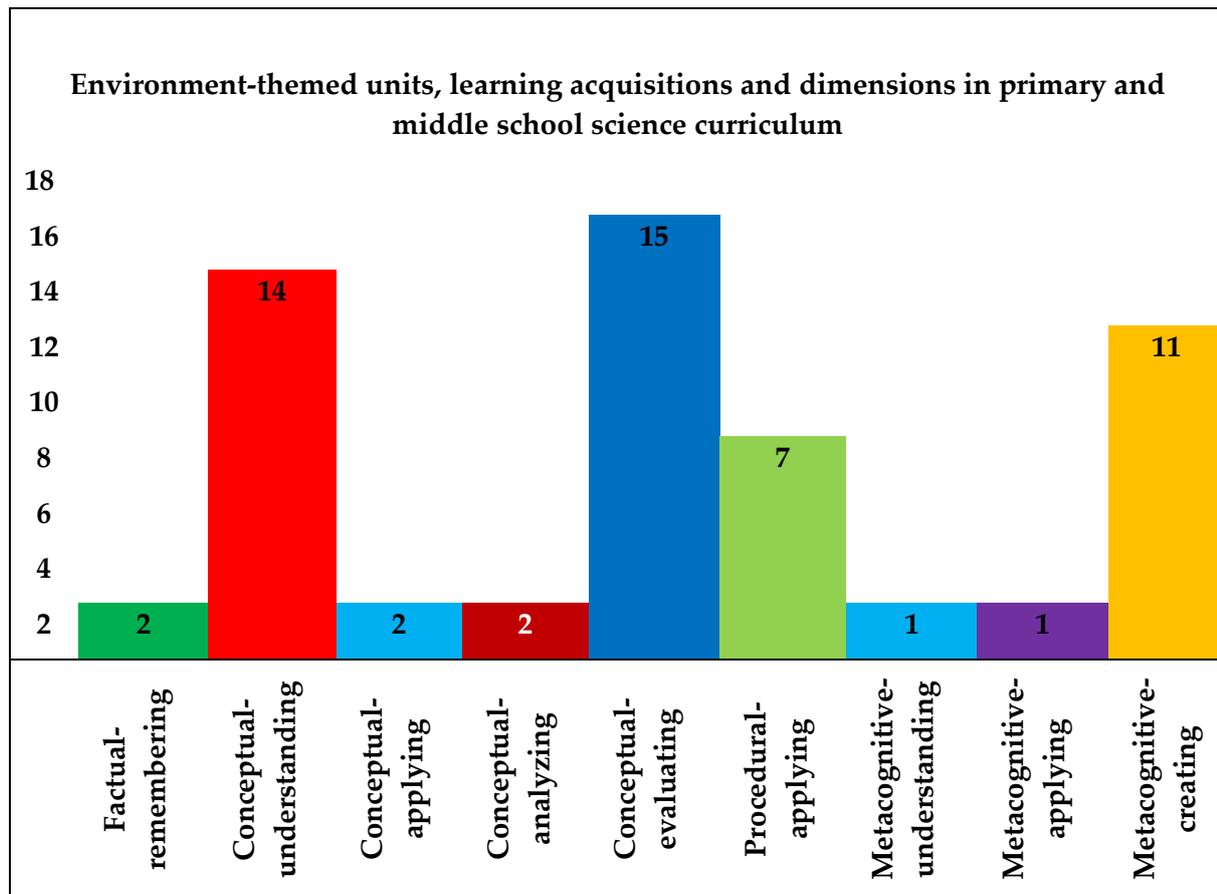


Chart 2. Environment-themed units, learning acquisitions and dimensions in primary and middle school science curriculum

When the chart 2 is examined, it is obvious that the environmental learning acquisitions are in factual-remembering (A1) 2, conceptual-understanding (B2) 14, conceptual- applying (B3) 2, conceptual- analyzing (B4) 2, conceptual- evaluating (B5) 15, procedural- applying (C3) 7, metacognitive-understanding (D2) 1, metacognitive- applying (D3) 1, metacognitive-creating (D6) 11 dimensions.

The matching of the 2018 Science Curriculum units and learning acquisitions within the framework of the Revised Bloom's Taxonomy is shown in Table 3.

Table 3. Matching the environmental learning acquisitions in the science curriculum with the Bloom's Taxonomy

Grade	Unit/Topic	Environmental Learning Acquisitions	Dimension
3rd grade	"Living things and life"	"Classifies entities as living and non-living using examples around them."	B2
		"Presents the fruits of observation of a plant's life cycle."	C3
		"Knows his/her environment."	A1
		"Takes an active role in the cleaning of the environment s/he lives in."	C3
		"Clarify the distinctions between natural and artificial environment."	B2
		"Designs an artificial environment."	D6
		"Realizes the importance of the natural environment for living things."	D2
		"Suggests solutions by researching to protect the natural environment."	D6
	"Physical Phenomena"	"Discusses the harm of waste batteries to the environment and what needs to be done in this regard."	B5
	"Matter and its Nature"	"Discusses the separation of wastes in terms of their contribution to the country's economy and effective use of resources."	B5
4th grade	"Physical Phenomena"	"Discusses the importance of economical use of lighting tools in terms of family and national economy."	B5
		"Examine the causes of light pollution."	B5
		"Explain the negative effects of light pollution on natural life and the observation of celestial bodies."	B2
		"Produces solutions to reduce light pollution."	D6
		"Examine the causes of sound pollution."	B5
		"Explain the negative effects of sound pollution on human health and the environment."	B2

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		"Produces solutions to reduce sound pollution."	D6
		"Pays attention to act sparingly in the use of resources."	C3
	"Living things and life"	"Realizes the importance of resources necessary for life and recycling."	B2
		"Classifies living things in compliance with their similarities and differences by giving examples."	B4
		"Examines the importance of biodiversity for natural life."	B5
		"Discuss the factors that threaten biodiversity based on research data."	B5
		"Express the importance of interaction between human and nature."	B2
		"Offers suggestions for the solution of an environmental problem in the immediate vicinity or in the country."	D6
5th grade	"Living things and life"	"Makes inferences about environmental problems that may arise in the future in consequence of human activities."	B2
		"Deliberates the benefits and harm situations in human-environment interaction on examples."	B5
		"Explain the destructive natural events caused by natural processes."	B2
		"Express ways of protection from destructive natural events."	A1
		"Discusses the importance of heat insulation in buildings in terms of family and country economy and effective use of resources."	B5
6th grade	"Matter and its Nature"	"Classifies fuels as solid, liquid and gaseous fuels and gives examples of commonly used fuels."	B2
		"Discusses the effects of the use of different types of fuels for heating purposes on humans and the environment."	B5
		"Researches and reports the precautions to be taken regarding stove and natural gas poisoning."	B3
	"Earth and	"Expresses the causes of space debris and predicts	B2

7th grade	Universe”	the possible consequences of this pollution..”	
		“Distinguishes between recyclable and non-recyclable materials in household waste.”	B4
	“Matter and its Nature”	“Designs projects for recycling of domestic solid and liquid wastes.”	D6
		“Examines recycling in terms of effective use of resources.”	B5
		“Pays attention to waste control in the immediate vicinity.”	D3
		“Designs projects to deliver reusable items to those in need.”	D6
	“Living things and life”	“Takes care of a plant or animal and reports its progress.”	C3

When Table 3 is examined, it is evident that a total of 9 learning acquisitions in 2 different units (Living Things and Life, Physical Phenomena) in the 3rd grade, and a total of 11 learning acquisitions in 3 units (“Matter and Its Nature, Living Things and Life, Physical Phenomena”) in the 4th grade, a total of 8 learning acquisitions in 1 unit (Living Things and Life) in the 5th grade, and a total of 4 learning acquisitions in 1 unit (Matter and Its Nature) in the 6th grade, a total of 7 learning acquisitions in 3 units (“Earth and Universe, Living Things and Life, Matter and Its Nature”) in 7th grade is directly related to the environment.

Environmental Education in Primary and Middle School Social Studies Course

With the Social Studies Curriculum, students can;

- “Recognize the general geographical features of the world and the environment they live in, explain the interaction between people and the environment and develop their spatial perception skills,”
- “Be aware of the limitations of the natural environment and resources, try to protect natural resources with environmental awareness and have a sustainable environmental understanding,”.

These main objectives emphasizing environmental education are included in curriculum (MEB, 2018c).

There are a total of 131 learning acquisitions belonging to the social studies course. Eighteen of these learning acquisitions are related to the environment, and their percentage in total is 13.74%. Emphasis was placed on the environment in the learning topics of “People, Places and Environments”, “Science, Technology and Society” and “Production, Distribution and Consumption” of the social studies course. The distribution of the learning acquisitions in the curriculum in compliance with the Revised Bloom’s Taxonomy is shown in Chart 3.

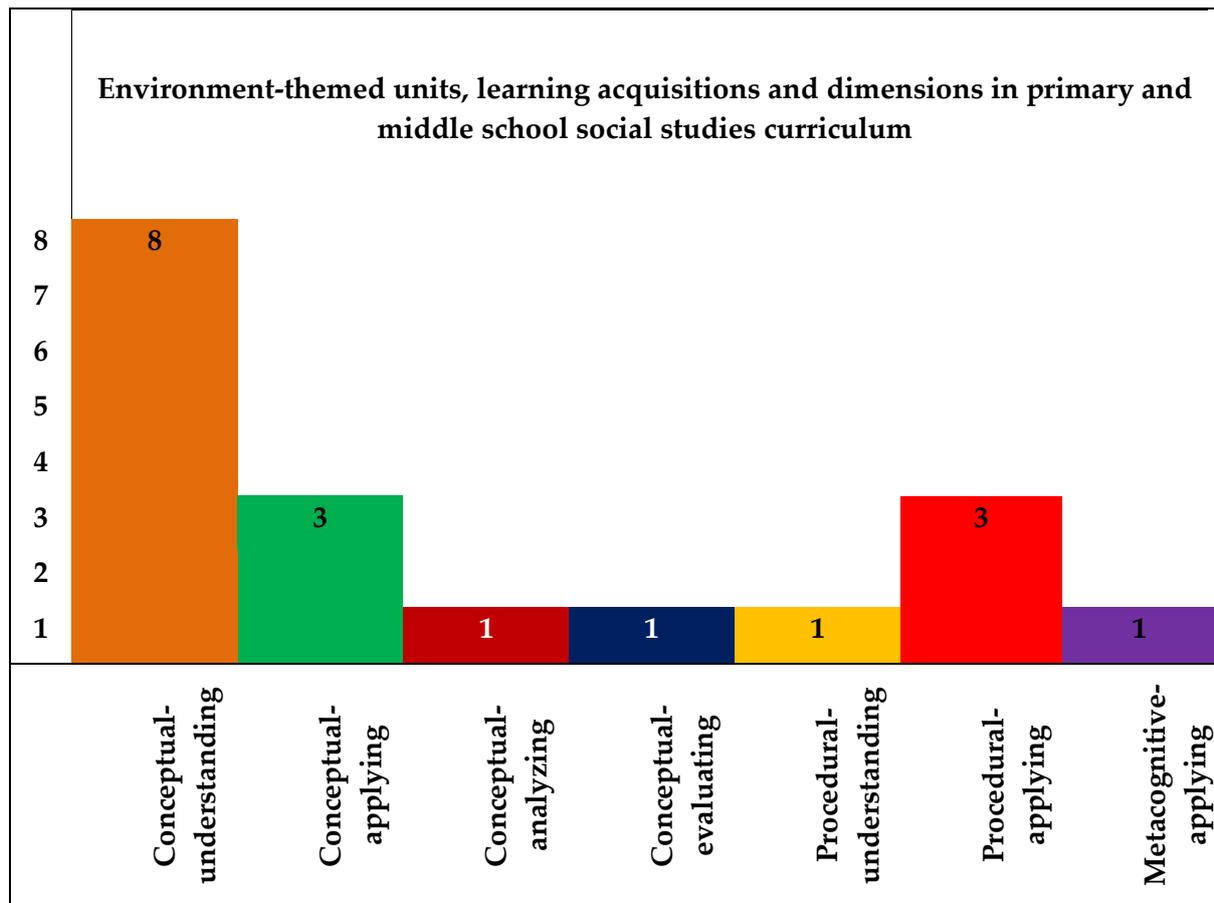


Chart 3. Environment-themed units, learning acquisitions and dimensions in primary and middle school social studies curriculum

When the chart 3 is examined, it is evident that the environmental learning acquisitions are in conceptual-understanding (B2) 8, conceptual-applying (B3) 3, conceptual-analyzing (B4) 1, conceptual-evaluating (B5) 1, procedural-understanding (C2) 1, procedural- applying (C3) 3, metacognitive-applying (D4) 1 dimensions.

The matching of the 2018 Social Studies Curriculum learning topics and learning acquisitions within the framework of the Revised Bloom's Taxonomy is shown in Table 4.

Table 4. Matching the environmental learning acquisitions in the social studies curriculum with Revised Bloom's Taxonomy

Grade	Unit/Topic	Environmental Learning Acquisitions	Dimension
4th grade	"People, Places and Environments"	"Distinguishes natural and human elements in the environment s/he live in."	B4
		"Observes the weather events occurring around him/her and transfers his/her findings to illustrated graphics."	C2

		"Makes inferences about the landforms and population characteristics of where s/he lives and around."	B2
		"Makes the necessary preparations for natural disasters."	C3
	"Science, Technology and Society"	"Uses technological products without harming him/herself, others and nature."	C3
	"Production, Distribution and Consumption"	"Distinguishes wants and needs, makes conscious choices between the two."	D4
		"Uses the resources without wasting."	C3
5th grade	"People, Places and Environments"	"Explains the landforms of the place where s/he lives and her/his environment on maps."	B2
		"Explains the effect of the climate in the environment s/he lives in on human activities by giving examples from her/his daily life."	B2
		"Gives examples of the effects of natural features and human characteristics on population and settlement in and around the place where s/he lives."	B2
		"Examines the causes of disasters and environmental problems in the environment s/he lives in."	B5
		"Explains the effects of natural disasters on social life with examples."	B2
6th grade	"People, Places and Environments"	"Defines the geographical location of continents, oceans and our country using concepts related to location."	B3
		"Examines Turkey's physical geography features, landforms, climatic features and vegetation on maps."	B3
		"Shows the basic human geography characteristics of Turkey on maps."	B3
		"Makes inferences about climate characteristics based on human experiences in different natural environments of the world."	B2

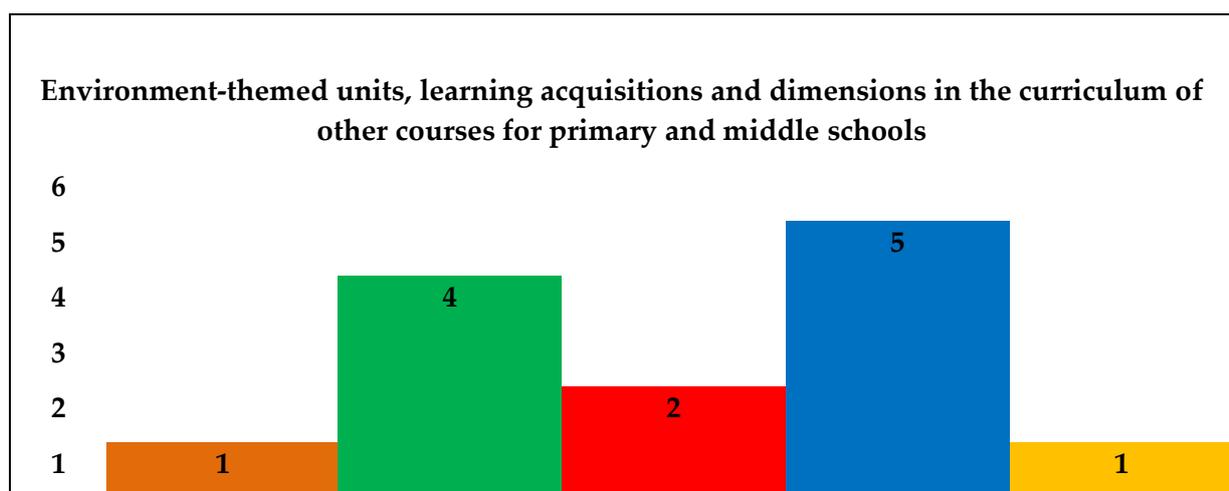
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	"People, Places and Environments"	"Makes inferences about the factors affecting the settlement from the past to the present through case studies."	B2
7th grade	"Production, Distribution and Consumption"	"Explain the importance of soil in production and management with examples from the past and present."	B2

When Table 4 is examined, it can be easily seen that a total of 7 learning acquisitions in 3 learning areas ("People, Places and Environments - Science, Technology and Society - Production, Distribution and Consumption") in the 4th grade, and a total of 5 learning acquisitions in 1 learning area (People, Places and Environments) in the 5th grade. a total of 4 learning acquisitions in 1 learning area (People, Places and Environments) in the 6th grade and 2 learning acquisitions in 2 learning areas (People, Places and Environments - Production, Distribution and Consumption) in the 7th grade are directly related to the environment.

Environmental Education in Other Courses in Primary and Middle Schools

In addition to Science of Life, Science and Social Studies courses, environmental subjects were included in seven other courses. Environmental education was included in 13 learning acquisitions in total. There courses are Physical Education and Play 2 (MEB, 2018d), Human Rights, Citizenship and Democracy 1 (MEB, 2018e), Traffic Safety 1 (MEB, 2018f), Visual Arts 2 (MEB, 2018g), Our City 5 (MEB, 2021), Religious Culture and Moral Knowledge 1 (MEB, 2018i) and Our Prophet's Life 1 (MEB, 2018k). The distribution of the learning acquisitions in the curricula in compliance with the Revised Bloom's Taxonomy is shown in Chart 4.



Factual-remembering	Conceptual-understanding	Conceptual-applying	Procedural-applying	Metacognitive-understanding
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Chart 4. Environment-themed units, learning acquisitions and dimensions in the curriculum of other courses for primary and middle schools

When Graph 4 is examined, it is seen that the learning acquisitions related to the environment are factual-remembering (A1) 1, conceptual-understanding (B2) 4, conceptual-applying (B3) 2, procedural-applying (C3) 5, metacognitive-understanding (D2) 1 dimension.

The matching of the units/topics and learning acquisitions in the other courses' curriculum in compliance with the Revised Bloom's Taxonomy is shown in Table 5.

Table 5. Matching the environmental learning acquisitions in other curricula with Bloom's Taxonomy

Course	Grade	Unit/Topic	Environmental Acquisitions	Learning Dimension
Physical Education and Play	2nd grade	"Active and Healthy Living"	"Shows environmental awareness while participating in games and physical activities in nature."	C3
	4th grade	"Active and Healthy Living"	"Shows environmental awareness in games and physical activities."	C3
Human Rights, Citizenship and Democracy	4th grade	"Rights, Freedoms and Responsibilities"	"Explains the ways to have the responsibility of being human."	B2
Traffic Safety	4th grade	"Safety in Traffic"	"Uses safe roads around him/her in his/her daily life."	C3
Visual arts	5th grade	"Art Critique and Aesthetics"	"Compares the natural and artificially built environment."	B2
	8th grade	"Visual Communication and"	"Reflects current events on visual art work (<i>Can benefit from topics such as natural disasters,</i>	C3

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	grade	Modelling"	<i>environmental awareness</i>)."	
Our city		"The Story of the Cities"	"Based on the elements that make up the city, knows what the city is."	A1
	5th, 6th, 7th and 8th grade	"Life in the City"	"Understands that the city is not just made up of people, but that it is necessary to be compassionate and sensitive to other living beings."	B2
		"I Know My City"	"Researches the geographical location and geographical features of the province where s/he lives."	B3
			"Explains the human-nature interaction in the city s/he lives in."	B2
Religious Culture and Moral Knowledge	8th grade	"Religion and Cleanliness"	"Gives importance to be clean and tidy."	C3
Our Prophet's Life	8th grade	"Our Prophet and Social Life"	"By taking the example of our Prophet, s/he realizes his/her responsibilities towards the environment."	D2

When Table 5 is examined, a total of 2 learning acquisitions at two different grade levels (2nd grade- Active and Healthy Living, 4th grade- Active and Healthy Living) in the Physical Education and Play course, 1 learning acquisition at one grade level in the Human Rights, Citizenship and Democracy lesson (4th grade- Rights, Freedoms and Responsibilities), 1 learning acquisition in the Traffic Safety course (4th grade- Safety in Traffic), a total of 2 learning acquisitions in two different grade levels in the Visual Arts course (5th grade- Art Critique and Aesthetics, 8th grade- Visual Communication and Modelling), a total of 5 acquisitions in the Our City course (The Story of the Cities, Life in the City, I Know My City), 1 learning acquisition in the Religious Culture and Moral Knowledge course (8th grade- Religion and Cleanliness), 1 learning acquisition in Our Prophet's Life course (8th grade- Our Prophet and Social Life) is directly related to the environment.

Table 6 shows the matching of the learning acquisitions in the curriculum based on the courses given at the primary education level in Turkey in compliance with Bloom's Taxonomy.

Table 6. Environmental learning acquisitions and Revised Bloom's Taxonomy matching in primary school courses in Turkey

Dimension	Knowledge Dimension-Cognitive Process Dimension				Total
	Science of Life	Science	Social Studies	Other Curricula	
A1	1	2	-	1	4
A2	3	-	-	-	3
A3	4	-	-	-	4
A4	-	-	-	-	-
A5	-	-	-	-	-
A6	-	-	-	-	-
B1	-	-	-	-	-
B2	5	14	8	4	31
B3	-	2	3	2	7
B4	1	2	1	-	4
B5	-	15	1	-	16
B6	-	-	-	-	-
C1	-	-	-	-	-
C2	-	-	1	-	1
C3	7	7	3	5	22
C4	-	-	-	-	-
C5	-	-	-	-	-
C6	-	-	-	-	-
D1	-	-	-	-	-
D2	2	1	-	1	4
D3	-	1	-	-	1
D4	-	-	1	-	1

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D5	-	-	-	-	-
D6	1	11	-	-	12
Total	24	55	18	13	110

When Table 6 is examined, it is seen that a total of 110 learning acquisitions are related to the environment in primary school curricula and the Science course (55) has the most environmental learning acquisitions. Nonetheless, it can be stated that Social Studies and Science of Life courses also come to the fore in environmental education.

The distribution of environmental learning acquisitions at primary school education level in compliance with Revised Bloom's Taxonomy is given in Chart 5.

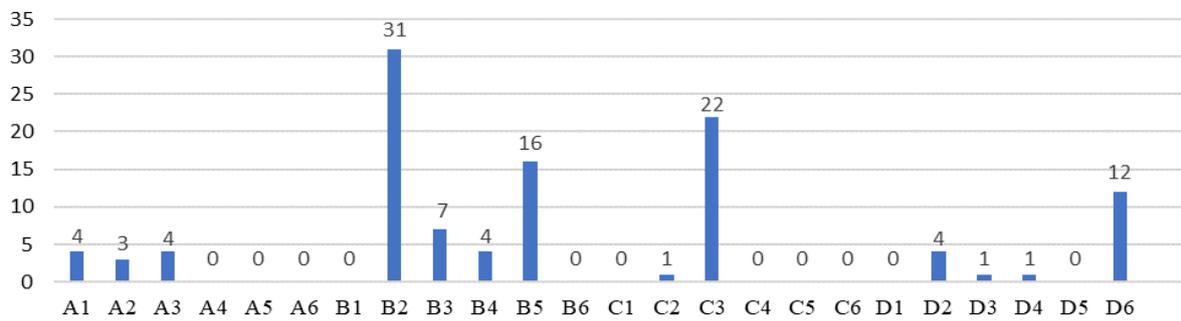


Chart 5. Distribution of environmental learning acquisitions in primary school education curriculum in compliance with the Revised Bloom's Taxonomy

When Chart 5 is examined, it is obvious that it is mostly at the level of conceptual knowledge-understanding (31 learning acquisitions). In addition, it is noteworthy that there is an imbalance in the distribution of the learning acquisitions and in some levels, the learning acquisitions on environment-themed subjects are not included.

Conclusion and Discussion

In line with the main purpose of the research, primary and middle school curricula were examined and environmental learning acquisitions were evaluated in line with the Revised Bloom's Taxonomy. As a result of this, in line with the first sub-objective of the research, it was determined that the learning acquisitions related to the environment in the Science of Life Curriculum were mostly in the procedural-applying level (7 learning acquisitions). It was also found out that the learning acquisitions in the curriculum were not evenly distributed in compliance with the Revised Bloom's Taxonomy. Nevertheless, it was concluded that the environmental learning acquisitions were distributed more evenly according to the grade level.

In line with the second sub-objective, it was determined that the environmental learning acquisitions in the Science Curriculum were mostly (15 learning acquisitions) in the conceptual-evaluating level and were not evenly distributed in terms of the Revised Bloom's

Taxonomy dimensions. In addition, it was determined that the environmental learning acquisitions were not evenly distributed in compliance with the grade level.

In line with the third sub-objective, it was concluded that the environmental learning acquisitions in the Social Studies Curriculum were mostly included in the conceptual-understanding level (8 learning acquisitions). In addition, it was found out that the learning acquisitions were not evenly distributed in terms of both the Revised Bloom's Taxonomy dimensions and the grade level.

In line with the fourth sub-objective of the research, it was determined that the environmental learning acquisitions in other curricula were mostly in the procedural-applying level (5 learning acquisitions). Furthermore, it was concluded that the learning acquisitions were not evenly distributed both in terms of the Revised Bloom's Taxonomy dimensions and between the courses.

When the curricula were evaluated in terms of environmental education, it could be stated that science of life, science and social studies courses stand out as the courses that were at the forefront in environmental education. When the learning acquisitions were evaluated in compliance with the class level, it was concluded that there was an imbalance between the class levels in terms of environmental learning acquisitions. However, it was found out that in the 8th grade (19 learning acquisitions), in the 4th grade (18 learning acquisitions) and in the 3rd grade (17 learning acquisitions), environmental learning acquisitions were given more attention.

In conclusion, when the curricula of the courses implemented at the primary school education level were evaluated in compliance with the Revised Bloom's Taxonomy levels in terms of environmental education, it was determined that the learning acquisitions indicated an unbalanced distribution. This situation is thought to be an obstacle to the effective teaching of environmental education. In addition, it was determined that environmental-related learning acquisitions mostly covered low-level learning acquisitions (remembering-understanding-applying), while higher-level learning acquisitions (analyzing-evaluating-creating) were included less. In the cognitive process dimension, it was concluded that it was mostly in the factual, conceptual and procedural dimension, and metacognitive dimension was included in a fewer learning acquisitions.

In line with these results;

- Revising the environmental dimension of the curricula and distributing the learning acquisitions to the classes and courses in an equal way,
- Addressing environmental subjects, which have an interdisciplinary structure, in more courses,
- Improving environmental learning acquisitions in a way that includes high-level learning acquisitions in terms of quality,
- Increasing the number of learning acquisitions in courses with inadequate environmental learning acquisitions,
- This research is limited to primary and middle school levels, and similar studies should be conducted on higher education,

- Textbooks should be revised in compliance with the Revised Bloom's Taxonomy in terms of environmental learning acquisitions.

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