

# Ecological Citizenship Scale Development Study\*

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## Abstract

Ecological citizenship is a type of citizenship that encourages individuals, communities and organizations as citizens of the world to consider environmental rights and responsibilities. When the literature is examined, it is seen that there are four most emphasized dimensions of ecological citizenship. These are responsibility, sustainability, rights and justice and participation. It is only possible to raise people as ecological citizen by educational activities. For this reason, measuring of the level of teachers' ecological citizenship is crucial. It is also found that there is no scale aiming to assess the level of teachers' ecological citizenship, so the goal of this study is determined to develop a scale measuring the ecological citizenship of teacher candidates. After analyzing the related studies and literature in this field, a trial form of the scale was developed with 53 items which are graded as 5 point Likert Scale. After the development of the scale, it was presented to the experts' opinions to analyze the content and face validity of the scale, and according to the experts' ideas, nine items were discarded from the scale. In order to gather evidence for the validity and reliability of the scale, the scale form of 44 items was applied to a total of 532 teacher candidates who were studying in different branches in the 2016-2017 Education Year Spring Semester. As for item analysis, the item total correlations were calculated and item analysis based on the lower and upper 27 % group was performed. In order to investigate the structural validity of the scale, Exploratory and Confirmatory Factor Analysis were performed. As a result of these analyzes, a final scale with a 4-factor structure consisting of 24 items and accounting for 49.811% of the total variance has been reached. These factors have been named as Participation, Sustainability, Responsibility, Right and Justice. In the Confirmatory Factor Analysis of the Ecological Citizenship Scale, it has been found that the proposed model has been verified and the model-data fit is perfect level. For the reliability of the scale, the Cronbach-Alpha Internal Consistency Coefficient was calculated for the whole scale and according to the factors. According to this, the Cronbach-Alpha Internal Consistency Coefficient for the whole scale was found as 0.901. The coefficients as for factors were estimated like that: 0.865 for Participation, 0.762 for Sustainability, 0.745 for Responsibility and 0.636 for Rights and Justice. All these findings have showed that the Ecological Citizenship Scale is a valid and reliable scale for the teacher candidates.

**Keywords:** Ecological citizenship, ecological citizenship scale, validity, reliability.

## Introduction

Citizenship is a political concept that determines the relationship of the individual to the state in which the individual is a member and draws the framework of these relationships. Citizenship is therefore a legal status attributed to the individual by the state (Engle and Ochoa, 1988). This concept has come to the agenda especially with the emergence of the French Revolution and the nation states. The meaning of this concept which

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emerged at that time to emphasize the rule and equality of the people has changed and transformed in the historical process. This transformation is particularly influenced with the changes in society-state relations (Özkazanç, 2009). This change and transformation is also seen in Marshall's citizenship model. This model of Marshall is based on three types of citizenship that have been developed within a certain sequence within the historical process. These; civil citizenship, which emerged in the 18th century on the basis of civil rights, political citizenship developed on the basis of political rights (voting) in the 19th century, and social citizenship that emerged as a product of the 20th century, social rights (Sarıpek, 2006). Here we see that citizenship is a civilian way of life that is not limited to political activities. Citizenship identified with obligations has now begun to be identified with rights in the modern age (Marshall, 2009). Citizenship with this feature is now a high level reached by the individual (Yılmaz, 2007). This status (citizenship), which the individual possesses, requires him to play many roles as status requires. Westheimer and Kahne (2004) actually clarify which roles the individual should play as a citizen nowadays in the answer of the question "What kind of citizenship is?". According to them, today's modern societies have three kinds of citizens. These are: responsible citizen, participant citizen and citizen who take justice to the centre.

Traditional conceptualizations between society and the state are gradually losing their influence dealing with current world problems (Beck, 2003). Therefore, it is not possible to combat global problems such as war, terrorism, smuggling and climate change. Today, besides nation-defined citizenship, a new understanding of citizenship has emerged that Kant (2010) defines as a citizen of the world but is widely expressed as global citizenship. With global citizenship, individual's right and responsibilities have exceeded the boundaries of the nation-state that he is belong to. Dower (2000) defines the global citizen as one who dedicates himself ethically to global goals, uses existing institutions to do so, and creates and supports institutions / organizations for the same purpose. For this, a global citizen must have some knowledge, skills, values and attitudes to take on the responsibility of the world (Kan, 2009). Morais and Ogden (2010) handle the global citizenship in terms of social responsibility, global competence and global civic participation dimensions and concretize this concept more. In the changing world, new forms of citizenship have emerged for effective solution of national, regional and global problems. One of the new forms of citizenship is ecological citizenship.

### **Ecological Citizenship**

Before explaining the concept of ecological citizenship, it is useful to briefly mention the concept of ecology. Ecology is a science that examines the relation of living things to each other and their surroundings (Yıldız, et al., 2009). Today, ecology and environmental science are used instead of each other and even environmental science seems to be used more widely than ecology concept. However, Çalgüner (2003) states in his book titled "Is it environment or ecology?" that ecology word is simplified and misused, thus saying that ecology has a broader meaning than environmental and environmental science concepts. This is an important identification. Because there need for a starting point to tackle the environmental problems we face. Ecology is the starting point. The solution of environmental problems is possible by understanding the ecology correctly and by relying on the information produced by this science to re-examine our relations with nature. Çalgüner expresses the ecology as a science that brings a wider understanding of nature and the relation of humanity with the natural world than the environment, and sees it as a science whose objective is the balance and integrity of the biosphere. (Çalgüner, 2003).

Today, human beings have great problems in relation to the natural world. Biosphere equilibrium and integrity have begun to deteriorate as a result of human activity, which sees itself not as a part of the ecosystem but as the master. This deterioration began to be taken seriously after it had adversely affected human life and was described as environmental problems. Human beings, who have been approaching nature with only a human-centered point of view, have begun to pay the cost of economic prosperity (Kılıç, 2008) as environmental problems. One of the most basic principles of nature is that, it responds what is done to itself. Humankind has forgotten this principle. The severe consequences of maltreatment have been experienced today (Kışlalıoğlu and Berkes, 2010). These severe consequences are experienced in not only in the physical surroundings of human beings the values, but also in thoughts and emotions of human beings as a result of natural poverty. Now people are looking for solutions to these problems for passion of a new world. It is the human being who put the world into this position, so solution is hidden himself. If people learn to live according to the rules of ecology and they can harmonize their behavior with the basic principles of ecology, a new hope for our world will arise. The people to realize this hope must be the ecological citizens.

In the literature, there are numerous equivalents or similar concepts of ecological citizens (green citizen, environmental citizen, sustainable citizen). Sometimes these concepts are used instead of each other, while sometimes they are separated from each other. Indeed, Dobson (2003) stated that the concept of environmental citizenship can be used more or less in place of the concept of ecological citizenship, but explains that there is a small distinction between these two concepts as following.

"Environmental citizenship deals mainly with environmental rights (acquisition and adopting of rights), particularly include the public sphere. The field of activity is limited by the political structure based on nation state modelling. Ecological citizenship is the ecological form of post-cosmopolitan citizenship and includes also non-contractual responsibilities. It is both borderline and public sphere, and it is cross border and works with the language of virtue. "

As a result, whether the responsibilities arising from contract or non-contractual responsibilities, it is certain that there are some responsibilities of ecological citizens in order to sustain the ecological balance. For this reason, "responsibility" is one of the important dimensions of ecological citizenship.

In Horton (2006), environmental rights as well as environmental rights play an important role in environmental citizenship. Many countries have assured environmental rights under the Constitution (Kabaoğlu, undated; URL 1). But it is imperative for environmental citizens to make sense of the social justice necessary for everyone to use these rights and benefit from equal rights for all of them (Horton, 2006). Hence, justice is an important part of ecological citizenship. The main environmental rights that the individual has; the right to be informed about matters concerning the environment, the right to participate in decisions that concern the environment, and the appeal right given to the individual as alone or in groups in order to prevent damage, to stop and to recover in case of any damage to the environment. (Kabaoğlu, undated). In the website titled Environment Canada (2003) identifies environmental citizenship as follows: environmental citizenship is a type of citizenship that encourages individuals, communities and organizations as citizens of the world to consider environmental rights and responsibilities. (Cited: Macgregor & Szersynski, 2003). In this definition, it is emphasized that the rights and responsibilities are the basic attributes of ecological citizenship.

According to Dobson (2003), ecological citizenship is the citizenship of foreigners. In a sense, he accepts that all citizens are strangers to each other. Dobson goes beyond this

and states that ecological citizens are not only stranger to each other but also at the same time they are stranger in the space and time of each other, and for this reason the responsibilities of ecological citizenship expands in time and space. According to Dobson (2003), an ecological citizen knows that he has responsibility against generations who are not born yet and today's behavior will have an influence on the people of tomorrow. These assessments of ecological citizenship show us that ecological citizens should be global citizens at the same time as sustainable citizens. Özel (2007) emphasizes that the protection and development of citizenship rights cannot be provided by states and it is inevitable that to make cooperation both with inter-states and inter-communities in the problems that states cannot cope solely and emphasizes the necessity to transfer the sense of citizenship beyond national borders. In fact, globalization and sustainability became a driving force in the emergence of ecological citizenship as a new type of citizenship. Today, the fact that the solution of globalizing environmental problems cannot be resolved through the understanding of citizenship within the national borders has caused this new understanding of citizenship to be discussed and loudly spoken. For example, according to Saiz (2005), globalization has changed the perception of the environmental politics in two ways:

“First, environmental problems and effects are global. Therefore, it is necessary to seek solutions to these problems beyond the nation states. Second, globalization can be beneficial to local-global relationships and contribute to achieving a sustainable society goal” (Saiz, 2005).

Many environmental problems are rooted in the consequences of non-sustainable lifestyles of citizens (Hobson, 2013). So there is a need for a new form of citizenship that can lead to a change in the behavior of citizens with non-sustainable lifestyles. As a matter of fact, our main responsibility as an ecological citizen is to ensure that our ecological footprint is sustainable. If our ecological footprint is unsustainable, our responsibility should be to reduce it (Dobson, 2003). According to Dobson, however, the task of reducing this footprint does not remove the right to have adequate ecological space. Therefore, the responsibilities of the ecological citizen are asymmetric in that they are applicable only to those who have an unequal ecological area. While some people (especially developed country citizens) need to reduce their negative environmental impacts, others must have the right to increase environmental impact and use environmental goods and services (Jagers et al., 2014). This is only possible when the understanding of environmental justice is put into practice. Environmental justice could become a powerful tool for both the sustainability movement and the quality of life of some excluded groups (Agyeman and Evans, 2006). Active citizens who demand this concept of justice and who are engaged in initiatives for it are called ecological citizens.

Another dimension of ecological citizenship is the participation. Today participation is one of the concepts used when defining developed democracies. Participation is the involvement of individuals in the process of decision-making that involves the individual and the community in a way that affects these processes (Karatekin and Elvan, 2016). Citizens must demonstrate participation behavior in order to fulfill their responsibilities and obligations. However, research shows that young people's citizenship participation is low. (Karatekin, Kuş and Meray, 2014; Harris, Wyn & Younes, 2010; Doğanay, Çuhadar and Sarı, 2007; Henn, Weinstein, Forrest, 2005; Erdoğan, 2003; Torney-Purtra & Amadeo, 2003) Akyüz (2001) explains the participation in terms of environmental rights as to influence the establishment, change, protection and sustainable development of people living in an environment. Therefore, participation for the resolution of environmental problems is a right at the same time as a responsibility, as a duty (Karatekin, Kuş and Meray, 2014). In this sense, ecological citizenship should be seen as a mechanism of political participation in environmental decision-making processes (Martinho, Nicolau, Caeiro, Amador & Oliveira, 2010). Indeed, Steenbergen

(1994) argues that the concept of participation, which plays a key role in the definition of citizenship by Marshall, may help in determining the new attitude of the ecological citizen.

Ecological citizenship is a concept that continues to be debated. There are many elements within this concept. Individuals' information, attitudes towards environment and environmental literacy levels are a necessity for ecological citizenship but not sufficient. When the literature is examined, it is seen that there are four most emphasized dimensions of ecological citizenship. These are responsibility, sustainability, rights and justice and participation. In essence, ecological citizen is the citizen who is responsible for everything and every people with which he shared and will share the ecosystem. While fulfilling this responsibility, he acts with the understanding of right and justice. He controls the ecological footprint for a sustainable environment and a sustainable society. He demonstrates individual, social and political participation behaviors for the solution of environmental problems.

The education system and the educators have an important role in educating the citizens with these qualities. Just as the continuity of a country/state must require to get individuals to gain the consciousness of citizen (Hablemitođlu and Özmete, 2012), in order to ensure the sustainability of the world we live in and the ecosystem ecological citizenship consciousness need to be acquired. It is important to determine the ecological citizenship levels of the new generation teachers who will gain this awareness. Determining the ecological citizenship levels of preschool, classroom, social science, science teachers and pre-service teachers, who are especially responsible for the environmental education of preschool, primary and secondary school children and who can be effective in their becoming ecological citizenship will be effective in determining the pre-service and in-service trainings to be given to them. Studies conducted both in Turkey and abroad (Karatekin & Merey 2015; Karatekin, 2011; Timur, 2011; Altınöz, 2010; Kışođlu, 2009; Goldman, Yavetz, & Pe'er, 2006; Pe'er, Goldman and Yavetz, 2007; Purutçuođlu, 2008; O'Brien, 2007; Uzun, 2007; Murphy, 2002; Owens, 2000; Kibert, 2000; Wisconsin Center for Environmental Education, 1994) measure the environmental literacy levels of the individuals, their attitudes towards the environment, their behaviors and their knowledge. There has been no scale that directly measures ecological citizenship yet. The "Environmental Citizenship Behavior Scale for Primary School Students" developed by Özden (2011) and "Teacher Candidate Environmental Citizenship Scale" adapted by Erdilmen (2012) to Turkish are seen as the closest scales to measure ecological citizenship. The aim of this study is to develop an effective measurement tool to determine the ecological citizenship levels of teachers and pre-service teacher who will grow up with the awareness of new generations of ecological citizenship.

## **Methodology**

### *Working Group*

In this study, maximum diversity sampling was used among from the purposive sampling methods. The aim of the maximum diversity sampling method is to reflect the diversity of the individuals who may be parties at maximum level (Yıldırım and Şimşek, 2011). In order to ensure maximum diversity in the study, attention was paid to choose pre-service teachers studying in different branches of education. That was because pre-service involved in this research would be responsible for environmental education when they will become teachers. The Ecological Citizenship Scale (ECS) developed for this purpose had been applied to pre-service teachers who were studying in the department of Primary, Pre-School, Science and Social Science Education in Kastamonu University Faculty of Education. Gender and grade levels were also considered as for maximum

diversity. At development stage, the scale was applied to 540 volunteer students, but the data of 8 students were considered as invalid due to the lack of information and inconsistent responses. The distribution of the data obtained from valid 532 people is given in Table 1 according to their parents, class and genders.

Table 1.

*Characteristics of the Participants*

<b>Gender</b>	<b>N</b>	<b>%</b>
Female	422	79,3
Male	110	20,7
<b>Grade</b>	<b>N</b>	<b>%</b>
Freshmen	146	27,4
Sophomore	157	29,5
Junior	111	20,9
Senior	118	22,2
<b>Department/Major</b>	<b>N</b>	<b>%</b>
Primary Education	169	31,8
Social Science Education	92	17,3
Science Education	119	22,4
Pre-School Education	152	28,6

### Writing Items of the Scale and Generating Test Form

In the first stage of the scale development, the relevant literature was examined and attempts were made to determine the qualifications of the individuals who could be described as ecological citizens. According to the determined dimensions, a pre-test form consisting of 53 items was created by considering the item number balance. Quintet rating was preferred for the developed materials. Reactions to the items of the scale were made up of expressions that indicate the frequency of behaviors were determined as (1) Almost Never, (2) Rarely, (3) Sometimes, (4) Usually, and (5) Always.

Seven specialists were consulted for the prepared pre-test form, five field specialists, a Turkish Language and a Measurement Evaluation expert. The field experts were asked to mark each item on the appropriate size and to select one of the "appropriate", "needs to be corrected" and "not suitable" options for each item, and to write their opinions on the "Correction and Suggestion" section. Based upon the opinions of the experts, 9 inappropriate items were excluded from the scale. In the end 44 item pre-test form was generated.

### *Gathering Data*

The volunteer principle was considered when the scale was applied to the study group whose characteristics were previously specified. The applications that were realized in more than one session were made by the researchers and necessary permissions were obtained before the application. In addition, the participants were informed about the scale to be applied and the intended use of the points to be obtained was indicated so that the level of motivation of the individuals was increased and the reliability of the measures was tried to be provided. No identity information was requested from the participants, thus enabling the scale to be responded sincerely and accurately.

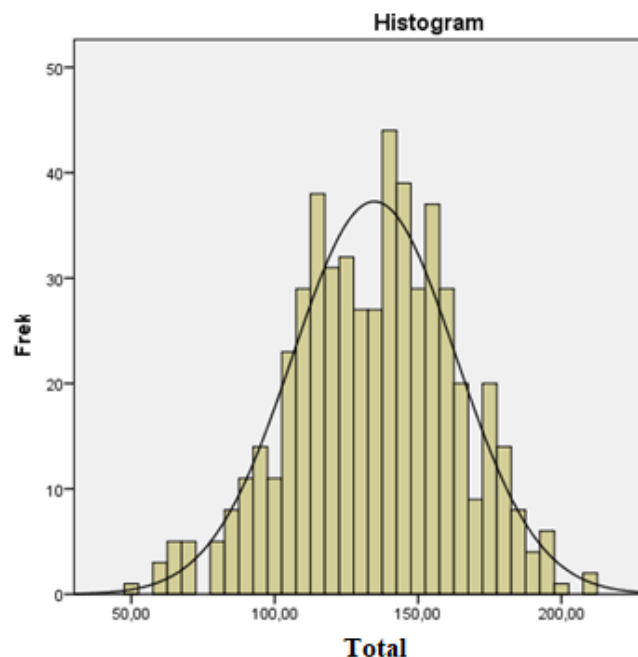
### Analyzing Data

44-item test scale form based on literature review and determined according to expert opinions was applied to 540 undergraduate students. Descriptive analyses of the scores obtained from the five-graded Likert-type scale were performed first, and item-total correlations of the items were then calculated to determine the items to be included in the scale. The limit value for these correlations was taken as 0.20 (Ebel, 1972). Another analysis at the item level was the calculation of the t test based on the difference of the upper and lower groups. After these methods of determining item validity, analyzes at the scale level were applied.

Construct validity of the scale was investigated by using the Exploratory Factor Analysis (EFA) method (Gorsuch, 1997). The construct identified by EFA was tested with Confirmatory Factor Analysis (CFA) (Kline, 2005), thus providing further evidence for construct validity (Crocker and Algina, 1986). For reliability studies, Cronbach Alpha coefficients were calculated and interpreted for both the scale and all dimensions created. Analyzes were performed using SPSS 22.0 (Statistical Programming for Social Sciences) and Lisrel 8.7 (Linear Structural Relations) package programs.

### Findings

The first analysis from the data obtained for the scale development study was to calculate the descriptive statistics of the scale scores. The highest score that could be obtained from the scale was 220 while the lowest score was 44. As a result of the pre-test application, the highest score was 212 and the lowest score was 50, so a large part of the expected range was achieved by the application. The average of the scores was 134.72, the median was 136, the mode was 126, and standard deviation was 28.47. The skewness coefficient calculated for the distribution was -156, and the kurtosis coefficient was -138. When these values obtained were examined, it was concluded that the normal distribution of the distribution was very close. The histogram graph of the scale scores obtained as a result of the pre-test application was given below.



**Graph 1.** Histogram Graph for Scale Scores

When the graph of the histogram of the scale scores in Graph 1 was examined, it was seen that the distribution of scores obtained from the pre-test was very close to normal distribution. After analysis of descriptive statistics, validity and reliability studies which were basic qualities of psychological measuring instruments had been conducted.

### **Validity**

Evidence of validity was collected at the item and scale level of the developed scale. Item analysis was conducted according to the sub scores of the item level and item total correlations were examined.

### **Item Analysis**

#### **1. Item Analysis Applied to Bottom-Top %27 Groups**

In this analysis, two sets of data consisting of 135 subjects in the bottom and top 27% groups according to the scale total score were created and the differences between the mean values at the item level were examined using the t-test. As a result of the analysis, it was found that the statistics calculated at the item level were significant for all the items. In other words, it was found that the mean of item scores changed significantly according to the participant in the bottom and top groups and all the items in the scale were reached as the result of the current measurements. The t values obtained at the item level were given in Table 2.

#### **2. Item Total Correlations**

Another way of examining the suitability of the items in the scale to the measured structure was to calculate the item total correlation coefficients. The limit value for the item total correlation coefficients was 0.20. Higher than this value and be significant could be regarded as evidence for validity of the items. Calculated corrected item total correlation coefficients for the generated scale were given in Table 2. When the values obtained were examined, it was seen that the correlations of the items with the total scores were high and significant. The calculated item total correlation coefficient for only number 30 item was below the limit value of 0.20. This item had been removed from the scale. The calculated values for the remaining 43 items ranged from 0.34 to 0.69. In this case, the results of the measurements made in parallel with the measured structure could be reached.



Table 2.

*Item Analysis*

Item	Mean	Sd	Corrected item total correlatin	Bottom-Top %27 t	Item	Mean	Sd	Corrected item total correlatin	Bottom-Top %27 t
1	2.69	1.370	0.442	10.949**	23	4.02	0.980	0.451	9.913**
2	2.44	1.078	0.503	13.029**	24	3.38	1.151	0.564	14.636**
3	3.20	1.328	0.344	8.272**	25	3.03	1.293	0.696	23.405**
4	3.02	1.134	0.611	17.704**	26	3.43	1.207	0.495	12.413**
5	3.81	1.266	0.473	11.659**	27	3.32	1.302	0.522	12.624**
6	3.11	1.271	0.620	18.453**	28	2.49	1.226	0.605	16.498**
7	3.27	1.306	0.461	11.954**	29	2.35	1.297	0.455	11.599**
8	4.12	1.093	0.403	8.361**	30	3.47	1.198	0.069	2.833**
9	2.79	1.251	0.487	11.913**	31	2.35	1.116	0.555	14.812**
10	3.70	1.066	0.475	10.450**	32	3.61	1.164	0.466	10.497**
11	2.26	1.146	0.467	12.055**	33	3.11	1.315	0.440	11.356**
12	3.37	1.351	0.409	9.840**	34	2.31	1.314	0.543	14.599**
13	2.55	1.127	0.590	14.519**	35	2.18	1.142	0.598	17.096**
14	3.30	1.119	0.507	12.873**	36	3.36	1.253	0.582	15.726**
15	3.74	1.147	0.464	11.122**	37	3.62	1.258	0.439	10.634**
16	3.58	1.098	0.591	15.059**	38	3.30	1.391	0.471	12.814**
17	3.86	1.196	0.528	13.181**	39	1.60	1.033	0.407	8.341**
18	3.59	1.048	0.647	16.984**	40	3.07	1.349	0.534	14.764**
19	2.45	1.157	0.622	19.293**	41	2.52	1.258	0.481	12.229**
20	2.89	1.245	0.570	15.374**	42	2.12	1.192	0.541	14.053**
21	2.99	1.243	0.456	10.456**	43	3.26	1.137	0.508	12.840**
22	3.47	1.077	0.667	17.460**	44	2.40	1.277	0.569	16.426**

When Table 2 was examined, the calculated item arithmetic averages, item standard deviations, corrected item total correlations and item t values calculated according to the bottom and top 27% group were shown for the 44 items included in the scale. When the results obtained from the analysis of constituents were examined, it was seen that t values increase in parallel with the increase of total correlations of items, and that all calculated t values were at the level of 0.01 level. Therefore, the results obtained from the analysis of items were complementary, and the result that all the items have worked towards measuring the subject in structure in a correct way was reached.

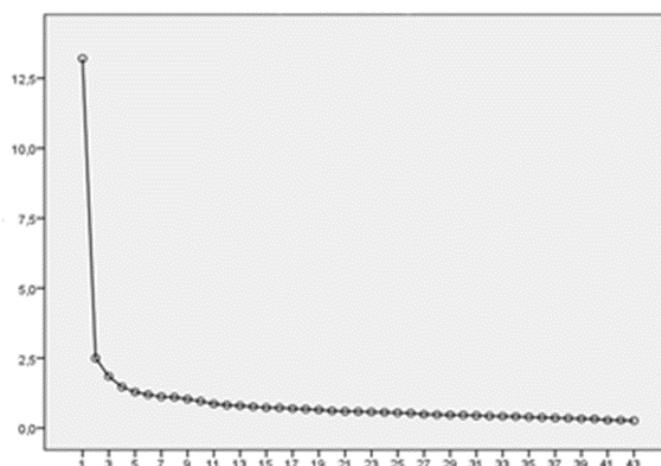
### Exploratory Factor Analysis

In order to collect information about the structure of the scale, the Basic Component Analysis, one of the Exploratory Factor Analysis methods, was made so that the original data set was divided into a set of linear variables (Field, 2005). Varimax was used as a vertical rotation method in the phase of factorization. This method was preferred because it was more suitable for multiple factorial constructs and allows more stable factorization than the Equamax method (Tabachnick and Fidell, 2001).

The suitability of sample size to factor analysis at the first stage of factor analysis was examined by the Kaiser-Meyer Olkin (KMO) Coefficient. This gave information on whether the sample size was large enough to perform factor analysis, and values close to 1 mean that the sample size was perfectly adequate for analysis (Tabachnick and Fidell, 2001). For the data set of 532 persons determined by taking at least 10 times the number of items in the scale in the pre-test application, the KMO coefficient was calculated as 0.945, which was the result that the data set was sufficient for analysis.

The analysis was continued by examining the missing values from the assumptions required to be met within the exploratory factor analysis. As a result of the examinations made, it was found that the missing values in the dataset were scattered randomly and less than 5% of the total dataset. For this reason, the missing data was completed with the average assignment technique.

Since the exploratory factor analysis was a parametric data analysis method, normality assumption must be met. This assumption was examined during the analysis with the Bartlett Globality Test. The test result was calculated as the chi-square value, which meant that the statistical data that came out make sense that it assumed a highly variable normality assumption (Tabachnick and Fidell, 2001). The result of the analysis was found to be significant of the Barlett test ( $\chi^2 = 9252.99$ ;  $p < 0.05$ ), so the result of the normality assumption for the dataset was reached. Other values of the assumptions to be examined under the EFA were also tested for the dataset. After it was determined that the hypotheses met, factor analysis was applied to reach the structure or structure measured by the scale items. As a result of the first exploratory factor analysis applied, it was determined that 10 factors were above the eigenvalue 1 and these factors revealed 58.97% of the total variance. To determine the appropriate number of factors related to the measured psychological structure, the screen plot graph and the variance ratios explained by the factors were taken into account with eigenvalues (Field, 2005; Kline, 2005). The generated screen plot was shown below.



**Graph 2. Screen Plot Graph**

Graph 2 shows the screen plot graph obtained as the result of the first Exploratory Factor Analysis of the scale consisting of 43 items. When the graph was examined, it was seen that the eigenvalue of the first factor was quite high and the curve had lost its slope since the 4th factor. Furthermore, when considering the variable number criterion that describes 2/3 of the total variance explained as the number of factors that could be considered as important factors, it was determined that a four - factor structure was compatible with the measured psychological structure and the analysis was repeated for four factors. In the repeated analysis for the four-factor structure, the factor loadings were excluded from the analysis, which were below the limit value of 0.32 (Tabachnick and Fidell, 2001) and the items determined to have a factor load above the acceptance value in more than one factor. According to the mentioned criteria, 19 items were determined to be low and factor load was excluded from the scale. The order of extraction of these items from the scale was as follows: (33,1,28,13,29,41,23,27,38,11,2,16,6,22,4,20,18,7,24). The remaining 24 items constitute a structure consisting of 4 bottom-factors with an eigenvalue greater than 1. The EFA results for the four-factor structure were given in Table 3.

Table 3.

*Factors Obtained as EFA Result and Factor Loads Related to the Items*

Participation		Sustainability		Responsibility		Right and Justice	
Item	Factor Load	Item	Factor Load	Item	Factor Load	Item	Factor Load
<b>I19</b>	3.741	<b>I3</b>	3.434	<b>I9</b>	4.045	<b>I5</b>	2.420
<b>I25</b>	3.366	<b>I26</b>	2.244	<b>I10</b>	2.593	<b>I8</b>	2.388
<b>I31</b>	3.934	<b>I32</b>	3.434	<b>I14</b>	2.939	<b>I12</b>	3.089
<b>I34</b>	3.312	<b>I36</b>	2.494	<b>I15</b>	3.612		
<b>I35</b>	4.195	<b>I37</b>	2.212	<b>I17</b>	2.928		
<b>I39</b>	3.812	<b>I40</b>	3.150	<b>I21</b>	3.352		
<b>I42</b>	2.402	<b>I43</b>	3.305				
<b>I44</b>	3.161						
Eigenvalue	13.207		2.515		1.895		1.487
Explained variance %	16.96		12.78		12.05		8.01

In Table 3, the factors obtained according to EFA, the factor loadings of the factors to which the items were related, the eigenvalues related to the factors and the explained variance ratios. When the values in the table were examined, it could be seen that the first factor of the four-factor structure obtained as a result of EFA was 8 items and disclosed 16.96% of the total variance. When the items in this factor were examined, it was determined that the items written about the dimension of participation during the scale development study were collected in this factor and the factor was named as "Participation". The second factor determined according to EFA was composed of 7 items and explains 12.78% of the total variance. When the items in this factor were examined, it was determined that they were related to the concept of sustainability in common and so this factor was called "Sustainability". The third factor explaining the measurement within the scope of the study explains 12,05% of the total variance and when the items in this factor were examined, were related to the responsibility defined in the concept of citizenship. Therefore, this factor consisting of 6 items was called "Responsibility". The last factor defined for the measured structure was composed of 3 items and accounts for 8.01% of the total variance. When the mentioned items were examined, they were found to be related to the dimension of rights and justice included in the concept of ecological citizenship and this factor was named as "Rights and Justice." As a result of exploratory factor analysis, a scale consisting of four factors and accounting for 49,811% variance was developed. While it was sufficient that the variance ratio was 30% or more in the single factor scales, this ratio was expected to be between 40% and 60% in multi-factor structures (Çokluk, Şekercioğlu and Büyüköztürk, 2010). Based on this information, the four-factor structure obtained was the result of the expected variance explained and the findings obtained from the Confirmatory Factor Analysis method, which wasevidence of construct validity, have been passed.

### **Confirmatory Factor Analysis**

Confirmatory Factor Analysis (CFA) was applied to test the structure obtained in the EFA related with the developed Ecological Citizenship Scale. The CFA was conducted on a group of 528 people and the values suggested by Lee (2007) were taken into account when determining this number. Lee (2007) suggests that a sample of 50 people was very weak, a sample of 100 people was weak, 200 people were moderate, 300 people were good, 500 people were very good and 1000 people was excellent for confirming factor analysis. In this case, it could be said that the size of the sample created for CFA was very good. The path diagram for the model obtained after the analysis was given in Annex 1. From the statistics obtained for the proposed model, first the t values were examined and it was determined that the t values calculated at the level of all variables changed between 8.75 and 15.74. Therefore, it was concluded that the t values of all variables included in the model were significant at 0.01 level. Following the t values for the variables, the standardized load coefficients, which were interpreted as similar to the factor loads in EFA, have been examined. The calculated standardized load factors for all variables and the explained variance ratios were shown in Table 4.

Table 4.

*Factor Loads Calculated by CFA and Explained Variances*

Participation			Sustainability			Responsibility			Right and Justice		
Item	$\lambda$	R <sup>2</sup>	Item	$\lambda$	R <sup>2</sup>	Item	$\lambda$	R <sup>2</sup>	Item	$\lambda$	R <sup>2</sup>
I19	0.64	0.41	I3	0.42	0.18	I9	0.55	0.30	I5	0.71	0.50
I25	0.71	0.50	I26	0.51	0.26	I10	0.64	0.31	I8	0.63	0.40
I31	0.64	0.41	I32	0.54	0.29	I14	0.56	0.40	I12	0.52	0.28
I34	0.68	0.46	I36	0.74	0.58	I15	0.55	0.33			
I35	0.75	0.56	I37	0.54	0.29	I17	0.65	0.43			
I39	0.59	0.35	I40	0.59	0.35	I21	0.51	0.26			
I42	0.69	0.48	I43	0.62	0.38						
I44	0.67	0.45									

The standardized path coefficients ( $\lambda$ ) calculated for the proposed model in Table 4 and the variance ratios (R<sup>2</sup>) of the observed variables were expressed in latent variables. When the path coefficients obtained were examined, it was seen that all values were over 0.50. The highest value was calculated as 0.75 for M 35 and the lowest value was calculated as 0.52 for 12. It was observed that the variance ratios calculated according to the standardized path coefficients were moderate and high. After analyzing at the item level of the composed model, the indexes which were indicative of general model data adaptation have been examined. For the model data adaptation, the value that should be examined first was the p value which gives information about the significance of the generated model and the p value calculated for the proposed model within the scope of this study was found to be significant at 0.01 level. This value was followed by a review of the proposed chi-square value (Jöreskog and Sorbom, 2003; Thompson, 2004) and the chi-square value of the model was 741.25, which was quite sensitive to the sample size and therefore considered together with the degree of freedom. When this value was compared to 248, which was defined as the degree of freedom, the value of 2.98 had been reached and this value below 3 indicates the acceptable level of adaptation of the model (Schermelele-Engel, Moosbrugger and Müller, 2003; Sümer, 2000). After evaluating the chi-square value, in the evaluation of the model data compatibility, Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square of Residuals (SRMR), Goodness Fit Index (GFI), Adjustable Goodness Fit Index (AGFI) for the model being established. (Jöreskog and Sorbom, 1993). Other fitness measures were the values of Comparative Fit Index (CFI), Normed Fit Index (NNFI) (Cheng, 2001). The recommended acceptance interval (Schermelele-Engel, Moosbrugger & Muller, 2003) for these compliance goodness indexes, which were used in evaluating the validity of the established theory and the compatibility of the data of a constructed model, was presented in Table 5.

Table 5.

*Indexes and Values Used in Evaluating Model Data Fit*

Criteria of Fitness	Good Fit	Acceptable Fit
RMSEA	$0 < \text{RMSEA} < 0,05$	$0,05 < \text{RMSEA} < 0,10$
SRMR	$0 \leq \text{SRMR} \leq 0,05$	$0,05 \leq \text{SRMR} \leq 0,10$
NFI	$0,95 \leq \text{NFI} \leq 1$	$0,90 \leq \text{NFI} \leq 0,95$
NNFI	$0,97 \leq \text{NNFI} \leq 1$	$0,95 \leq \text{NNFI} \leq 0,97$
CFI	$0,97 \leq \text{CFI} \leq 1$	$0,95 \leq \text{CFI} \leq 0,97$
GFI	$0,95 \leq \text{GFI} \leq 1$	$0,90 \leq \text{GFI} \leq 0,95$
AGFI	$0,90 \leq \text{AGFI} \leq 1$	$0,85 \leq \text{AGFI} \leq 0,90$

According to the values given in Table 5, the conformity assessment of the model created within the scope of the study was made and the values obtained at the model level were given in Table 6.

Table 6.

*Calculated Model Data Fit Indexes for the Tested Model*

Indexes	CFI	NFI	AGFI	IFI	GFI	SRMR	RMSEA	%90 RMSEA	C.I.
Values	0.96	0.94	0.87	0.96	0.90	0.058	0.061	0.056; 0.067	

When the indexes in Table 6 were examined, it was seen that the GFI value was 0.90 and above, which was mentioned in the literature as excellent model data fit (Jöreskog and Sorbom, 1993). The AGFI index, an index similar to the GFI, was found to be 0.87, indicating an acceptable level of fit. The other calculated indexes NFI (0.94), SRMR (0.058) and RMSEA (0.061) also indicate perfect fit of model data. Another finding was that the indexes of IFI and CFI, which were calculated in the analysis, were above 0.95, indicating that the model data fit was very good. When all the indexes and values obtained were interpreted in general, it was achieved that the model data compatibility was very good. Considering that the model data fit statistics indicate a high level of fit, it was not necessary to make the modifications recommended by the analysis. Another reason for this was that the proposed modifications do not lead to large reductions in chi-square values and were not supported theoretically. Therefore, the proposed modifications have not been carried out and the model had been adopted as recommended.

When the findings obtained by using exploratory and confirmatory factor analysis methods were examined together, the concept of ecological citizenship could be measured with the developed scale in a reasonable way and the reliability analyzes made for the scale were taken into consideration.

**Reliability**

For the Ecological Citizenship Scale, which was determined to be composed of four dimensions in the scope of the study, Cronbach alpha coefficient, which gives

information about internal consistency both at the factor level and for all of the scale, was calculated and the obtained values were given in Table 7.

Table 7.

*Reliability Coefficients Related to Overall of the Scale and Sub-Dimensions Determined by Factor Analysis*

Dimensions	Items Number	Cronbach Alpha Coefficient
Participation	8	0,865
Sustainability	7	0,762
Responsibility	6	0,745
Right and Justice	3	0,636
Overall of the Scale	24	0,901

Table 7 gives the Cronbach Alpha coefficients calculated for the whole scale and its sub-dimensions. When the obtained coefficients were examined, it was found that the Cronbach Alpha coefficient calculated at the scale level was over 0.90, so the internal consistency was achieved at a high level for the 24-item scale. When the coefficients calculated according to the dimensions were examined, it was seen that the Cronbach Alpha coefficient decreased in parallel with the decrease in the number of items and the lowest coefficient was calculated for the three-item right and justice dimension. This decrease was normal as the coefficient was directly affected by the number of substances (Turgut and Baykul, 2010). In summary, the scale consisting of four dimensions had supplied high reliability in terms of internal consistency.

Table 8.

*Correlation Coefficients between Factors of Ecological Citizenship Scale*

Factors	Participation	Sustainability	Responsibility	Right and Justice
Participation	1.00			
Sustainability	0,532**	1.00		
Responsibility	0.552**	0.530**	1.00	
Right and Justice	0.336**	0.463**	0.454**	1.00

As shown in Table 8, there was a significant relationship between the factors that make up the ecological citizenship scale. According to this, there was a low level positive relationship between participation and right and justice also responsibility and rights and justice. There was a moderately significant positive relationship between participation and responsibility also participation and sustainability. These findings show that all the factors that constitute the ecological citizenship scale were in the same structure.,

## Result

In this study, a scale was developed to measure ecological citizenship levels of pre-service teachers in different disciplines. The scale prepared to test the validity and reliability of the scale was applied to pre-service teachers. Item total correlations were calculated for the items in the scale and item analysis based on the bottom-top 27% group were performed. Exploratory Factor Analysis (EFA) was used for construct validity

of the scale, and Confirmatory Factor Analysis (CFA) was used for validation of the structure found. It had been determined that EFA was a four-factor structure. These factors were called "Participation", "Sustainability", "Responsibility", "Right and Justice". It had been found that factors consisting of all components together account for 49,811% of the total variance. In the Confirmatory Factor Analysis of the Ecological Citizenship Scale it was seen that the model data fit was in very good level. As a result of the EFA and CFA analyses, it could be said that the scale consisting of four factors was a valid structure. For the reliability of the scale, the Cronbach-Alpha internal consistency coefficient was calculated. Accordingly, the Cronbach-Alpha internal consistency coefficient for the whole scale was found to be 0.90. The Cronbach-Alpha internal consistency coefficients calculated for the factors were: participation 0.865, sustainability 0.762, responsibility 0.745 and right and justice 0.636. Following all these validity and reliability procedures, the scale was reached as a measurement tool that could be used in a valid and reliable manner in determining the ecological citizenship levels of pre-service teachers.

▪     ▪     ▪

## References

- Agyeman, J & Evans, B. (2006). Justice, governance and sustainability: Perspectives on environmental citizenship from North America and Europe. A. Dobson & D. Bell (Eds.), *Environmental citizenship* (pp.185-206). Cambridge, Massachusetts London: The MIT Press.
- Akyüz, E. (2001). Çocuk hakları sözleşmesinin temel ilkeleri ışığında çocuğun eğitim hakkı, *MEB Dergisi*, Sayı: 151.
- Altınöz, N. (2010). *Fen bilgisi öğretmen adaylarının çevre okuryazarlık düzeyleri*, Yayınlanmamış Yüksek Lisans Tezi, Sakarya Üniversitesi Fen Bilimleri Enstitüsü, Sakarya.
- Beck, U. (2003). Toward a new critical theory with a cosmopolitan intent. *Constellations*, 10(4), 453-468.
- Cheng, E. W. L. (2001). SEM being more effective than multiple regression in parsimonious model testing for management development research. *Journal of Management Development*, 20 (2), 650-667.
- Crocker, L., & Algina, J. (1986). Introduction to classical and modern test theory. Holt, Rinehart and Winston, 6277 Sea Harbor Drive, Orlando, FL 32887.
- Çalgüner, T. (2003). "Çevre" mi? "Ekoloji" mi? Ankara: Nobel Yayın Dağıtım.
- Çokluk, Ö., Şekercioğlu, G. & Büyüköztürk, Ş. (2010). *Çok değişkenli istatistik SPSS ve LISREL uygulamaları (1. Baskı)*. Ankara: Pegem Akademi Yayınları.
- Dobson, A. (2003). *Citizenship and the environment*, Newyork: Oxford University Press.
- Doğanay, A., Çuhadar, A. & Sarı, M. (2007). Öğretmen adaylarının siyasal katılımçılık düzeylerine çeşitli etmenlerin etkisinin demokratik vatandaşlık eğitimi bağlamında incelenmesi. *Kuram ve Uygulamada Eğitim Yönetimi*. (50), 213-246.
- Dower, N. (2000). The idea of global citizenship-A sympathetic assessment. *Global Society*, 14(4), 553-567.
- Ebel, R. L. (1972). *Essentials of educational measurement (2nd Edition)*. New Jersey: Prentice-Hall Literature.
- Engle, S. H., & Ochoa, A. S. (1988). *Education for democratic citizenship: Decision making in the social studies*. New York: Teachers College.
- Erdilmen, Ş. (2012). *Niğde üniversitesi eğitim fakültesi öğrencilerinin çevresel vatandaşlık düzeylerinin incelenmesi ve sosyal bilgiler öğretmenliği lisans*



- programı öğrencilerinin durumu ile karşılaştırılması*. Yayınlanmamış Yüksek Lisans Tezi. Niğde Üniversitesi Eğitim Bilimleri Enstitüsü. Niğde.
- Erdoğan, E. (2003). *Türk gençliği ve siyasal katılım: 1999-2003*, İstanbul: Toplumsal Katılım ve Gelişim Vakfı.
- Field, A. (2005). *Discovering statistics with SPSS. (2nd Edition)*. New Delhi: Sage Publications.
- Goldman, D., Yavetz, B., & Pe'er, S. (2006). Environmental literacy in teacher training in Israel: environmental behavior of new students. *Journal of Environmental Education* 38(1), 3-22.
- Gorsuch, R. L. (1997). Exploratory factor analysis: Its role in item analysis. *Journal of Personality Assessment*, 68(3), 532-560.
- Hablemitoğlu, Ş. & Özmete, E. (2012). Etkili vatandaşlık için bir öneri. *Ankara Sağlık Bilimleri Dergisi*, 1 (3), 39-54.
- Harris, A., Wyn, J. & Younes, S. (2010). Beyond apathetic or activist youth: 'ordinary' young people and contemporary forms of participation. *Young*, 18(1), 9-32.
- Henn, M., Weinstein, M. & Forrest, S. (2005). "Uninterested youth? young people's attitudes towards party politics in Britain", *Political Studies*, 53, (3), 556- 578.
- Hobson, K. (2013). On the making of the environmental citizen. *Environmental Politics*. 22(1), 56-72.
- Horton, D. (2006). Demonstrating environmental citizenship? A Study of Everyday Life among Green Activists. A. Dobson & D. Bell (Eds.), *Environmental citizenship*(pp.127-150). Cambridge, Massachusetts London: The MIT Press.
- Jagers, S.C., Martinsson, J. & Matti, S. (2014). Ecological citizenship: a driver of pro-environmental behavior? *Environmental Politics*. 23 (3), 434-453.
- Jöreskog, K. G., & Sörbom, D. (1993). *Lisrel 8: Structural equation modeling with the simplis command language*. Chicago: Scientific Software International.
- Kabaoğlu, İ. (Undated). *Çevre hakkı*. İletişim Yayınları.
- Karatekin, K. & Elvan, Ö. (2016). 8. Sınıf öğrencilerinin demokrasi kavramına ilişkin bilişsel yapıları. *Abant izzet baysal Üniversitesi eğitim fakültesi Dergisi*. 16 (Usbes Özel Sayı II), 1405-1431.
- Karatekin, K. & Meray, Z. (2015). Attitudes of preservice social studies teachers towards solid wastes and recycle, *Bayburt Üniversitesi Eğitim Fakültesi Dergisi*, 10 (2), 297-314.
- Karatekin, K., Kuş, Z. ve Meray, Z. (2014). Sosyal bilgiler öğretmen adaylarının çevre sorunlarının çözümünde sosyal katılımları. *İlköğretim Online*. 13(2), 345-361.
- Karatekin, K. (2011). *Sosyal bilgiler öğretmen adaylarının çevre okuryazarlık düzeylerinin belirlenmesi*, Yayınlanmamış Doktora Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü. Ankara.
- Kan, Ç. (2009). Değişen değerler ve küresel vatandaşlık eğitimi, *Kastamonu Eğitim Dergisi*, 17(3). 895-904.
- Kant, I. (2010). *Perpetual peace a philosophical sketch*, shapco printing, Inc., Minneapolis, Minnesota.
- Kılıç, S. (2008). *Çevre etiği ortaya çıkışı, gelişimi ve sonuçları*. Ankara: Orion Kitabevi.
- Kışlalıoğlu, M. & Berkes, F. (2010). *Çevre ve ekoloji*. İstanbul: Remzi Kitabevi.
- Kışoğlu, M. (2009) *Öğrenci merkezli öğretimin öğretmen adaylarının çevre okuryazarlığı düzeyine etkisinin araştırılması*, Yayınlanmamış Doktora Tezi, Atatürk Üniversitesi Fen Bilimleri Enstitüsü, Erzurum.
- Kibert, C. N. (2000). *An analysis of the correlations between the attitude, behavior, and knowledge components of environmental literacy in undergraduate university students*. Unpublished Master Dissertation, The Graduate School of the University of Florida, USA.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling (2nd ed.)*. NY: Guilford Publication, Inc.

- Lee, S.-Y (2007). *Structural equation modelling: A Bayesian approach*. England: John Wiley & Sons, Ltd.
- MacGregor, S. and Szerszynski, B. (2003) Environmental citizenship and the administration of life. Paper presented at 'Citizenship and the Environment' Workshop, Newcastle University, 4-6 September.
- Marshall, G. (2009). *Sosyoloji sözlüğü*. (Çev. Osman Akınhay & Derya Kömürcü). Ankara: Bilim ve Sanat Yayınları.
- Martinho, A.P., Nicolau, P.B., Caeiro, S., Amador, F. & Oliveira, C. (25-29 October, 2010). Environmental Citizenship and Participation. The Role of Education Programs. *Knowledge Collaboration & Learning for Sustainable Innovation, ERSCP-EMSU Conference*, Delft, The Netherlands.
- Morais, D. & Ogden, A. (2010). Initial development and validation of the global citizenship scale. *Journal of Studies in International Education*, 15 (5), 445-466.
- Murphy, T.P. (2002). The Minnesota report card on environmental literacy. Hamline University, Center for Global Environmental Education. (ERIC Reproduction Service No. ED 474505).
- O'Brien, M. R. S. (2007). *Indications of environmental literacy: using a new survey instrument to measure awareness, knowledge, and attitudes of university-aged students*, Unpublished Master Dissertation, Iowa State university, U.S.
- Owens, M.A. (2000). *The environmental literacy of urban middle school teachers*. Unpublished Doctoral Dissertation, Faculty of the Graduate School of Emory University, USA.
- Özden, D.Ö. (2011). *İlköğretim okullarında çevresel vatandaşlık eğitimi*, Yayımlanmamış Doktora Tezi, Marmara Üniversitesi Eğitim Bilimleri Enstitüsü, İstanbul.
- Özel, S. (2007). Küreselleşme döneminde vatandaşlık, *Anayasa Yargısı*, 24. 577-583.
- Özkazanç, A. (2009). Toplumsal vatandaşlık ve neo-liberalizm sorunu. *Ankara Üniversitesi SBF Dergisi*, 64 (1). 247-274.
- Pe'er, S., Goldman, D. and Yavetz B. (2007). Environmental literacy in teacher training: attitudes, knowledge, and environmental behavior of beginning students, *The Journal of Environmental Education*, 39 (1), 45-59.
- Purutçuoğlu, E. (2008). *Üniversite öğrencilerinin demografik özellikleri ve materyalist eğilimleri ile çevreye yönelik tutum ve davranışları arasındaki ilişkinin incelenmesi*, Yayımlanmamış Doktora Tezi, Ankara Üniversitesi Fen Bilimleri Enstitüsü, Ankara.
- Saiz, A. V. (2005). Globalisation, cosmopolitanism and ecological citizenship, *Environmental Politics*, 14 (2), 163-178.
- Sarıpek, D.B. (2006). Sosyal vatandaşlık ve günümüzde yaşadığı dönüşüm: aktif vatandaşlık. *Çalışma ve Toplum*, (2). 247-274.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8 (2), 23-74.
- Steenbergen, B.V. (1994). Towards a global ecological citizen. Bart van Steenbergen (Ed.). *The condition of citizenship*. (pp.141-152). London: SAGE Publications.
- Sümer, N. (2000). Yapısal eşitlik modelleri: temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları*, 3 (6) 49-74.
- Tabachnick, B. G & Fidel, L. S. (2001). *Using multivariate statistics*. MA: Allyn & Bacon, Inc.
- Thompson, B. (2004). *Exploratory and confirmatory factor analysis: understanding concepts and applications*. (First Edition). NY: Psychology Press.
- Timur, S. (2011). *Fen bilgisi öğretmen adaylarının çevre okuryazarlık düzeylerinin belirlenmesi*, Yayımlanmamış Doktora Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

- Torney-Purta, J. & Amadeo, J. (2003). A Cross-national analysis of political and civic involvement among adolescents. *Political Science and Politics*, 36, (2), 269-274.
- Turgut, M.F. & Baykul, Y. (2010). Eğitimde ölçme ve değerlendirme. Ankara: Pegem Akademi.
- Uzun, N. (2007). *Ortaöğretim öğrencilerinin çevreye yönelik bilgi ve tutumları üzerine bir çalışma*, Yayımlanmamış Doktora Tezi, Hacettepe Üniversitesi, Ankara.
- Westheimer, J & Kahne, J. (2004). What kind of citizen? the politics of educating for democracy. *American Educational Research Journal*.41 (2). 237-269.
- Wisconsin Center for Environmental Education (1994) *High school environmental survey*. Stevens Point, WI: WCEE.
- Yıldırım, A. & Şimşek, H. (2011). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayınları.
- Yıldız, K., Sipahioğlu, Ş. & Yılmaz M. (2009). *Çevre bilimi ve eğitimi*, Ankara: Gündüz Eğitim ve Yayıncılık.
- Yılmaz, D. (2007). *Üniversiteler için vatandaşlık bilgisi*. Konya: Çizgi Kitabevi.
- URL 1. Türkiye Cumhuriyeti Anayasası.  
<http://www.mevzuat.gov.tr/MevzuatMetin/1.5.2709.pdf>(Erişim Tarihi:28.08.2017).

# Ekolojik Vatandaşlık Ölçeği Geliştirme Çalışması

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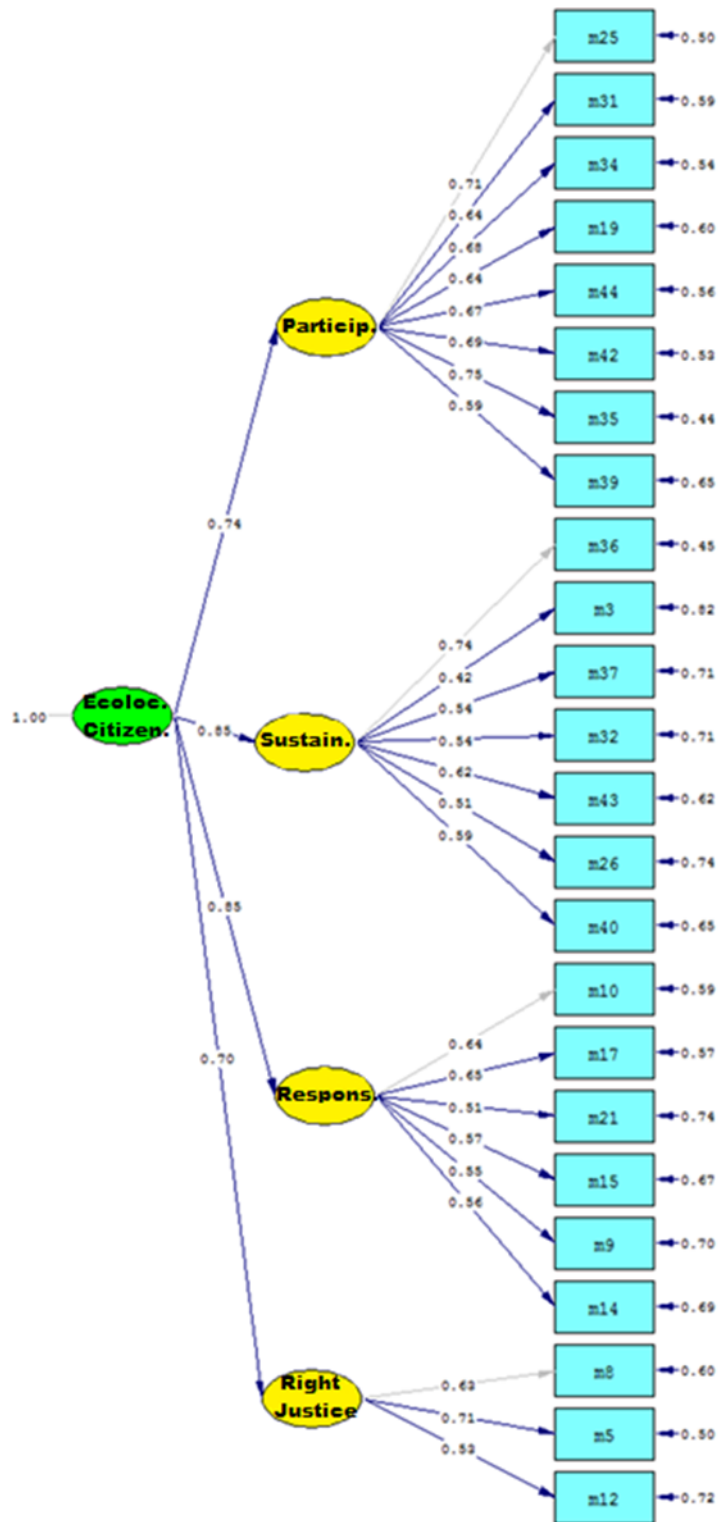
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## Özet

İnsanların ekosistemi paylaştığı tüm paydaşlara karşı bir sorumluluğu vardır. Bu sorumluluk, yeni bir vatandaşlık kavramını ortaya çıkarmıştır. Ekolojik vatandaşlık olarak isimlendirilen bu kavram çevre sorunlarının arttığı günümüzde bireylerin sadece mensubu olduğu devletin sadık bir vatandaşı olmasını değil aynı zamanda küresel dünyanın aktif ve duyarlı bir vatandaşı olmasını da gerektirmektedir. Literatür incelendiğinde ekolojik vatandaşlığın en çok vurgulanan dört boyutunun olduğu görülmektedir. Bunlar; sorumluluk, sürdürülebilirlik, hak ve adalet ile katılımdır. Bireylerin ekolojik bir vatandaş olarak yetişmesi ancak eğitim faaliyetleri ile gerçekleştirilebilir. Bu faaliyetleri gerçekleştirecek öğretmen adaylarının ekolojik vatandaşlık yeterliliklerinin tespit edilmesi önemlidir. Yapılan literatür taramasında ekolojik vatandaşlık kavramını ölçmeye yönelik etkili bir ölçme aracı olmadığı belirlenmiştir. Bu nedenle öğretmen adaylarının ekolojik vatandaşlık düzeylerini ölçmeye yönelik bir ölçme aracı geliştirmek bu çalışmanın amacını oluşturmuştur. Bu alanda yapılmış ilgili çalışmalar ve literatür incelendikten sonra 53 maddeden oluşan ve 5'li likert şeklinde hazırlanan ölçeğin deneme formu oluşturulmuştur. Hazırlanan likert tipi ölçeğin kapsam ve görünüş geçerliliği için uzman görüşüne başvurulmuştur. Uzmanların görüşlerine göre 9 madde ölçek dışında tutulmuştur. Geçerlik ve güvenilirlik kanıtlarının toplanması için ölçeğin 44 maddelik ön deneme formu 2016-2017 Eğitim-Öğretim Yılı Bahar Döneminde farklı branşlarda öğrenim gören toplam 532 öğretmen adayına uygulanmıştır. Ölçekte yer alan maddeler için madde toplam korelasyonları hesaplanmış ve alt ve üst %27'lik gruba dayalı madde analizi yapılmıştır. Ölçeğin yapı geçerliğini incelemek için de Açıklayıcı ve Doğrulayıcı Faktör Analizi yapılmıştır. Bu analizler sonucunda 24 maddeden oluşan ve toplam varyansın % 49.811'ini açıklayan 4 faktörlü bir yapıya sahip nihai ölçeğe ulaşılmıştır. Bu faktörler katılım, sürdürülebilirlik, sorumluluk, hak ve adalet olarak isimlendirilmiştir. Ekolojik Vatandaşlık Ölçeğinin Doğrulayıcı Faktör Analizinde model veri uyumunun çok iyi düzeyde olduğu tespit edilmiştir. Ölçeğin güvenilirliği için Cronbach-Alfa iç tutarlılık katsayısı hesaplanmıştır. Buna göre ölçeğin tamamı için Cronbach-Alfa iç tutarlılık katsayısı 0.901 olarak bulunmuştur. Faktörler için hesaplanan Cronbach-Alfa iç tutarlılık katsayıları ise sırasıyla 0.865, 0.762, 0.745 ve 0.636 olarak bulunmuştur. Tüm bu bulgular ışığında geliştirilen Ekolojik Vatandaşlık Ölçeğinin geçerli ve güvenilir bir ölçek olduğu sonucuna ulaşılmıştır.

**Anahtar Kelimeler:** Ekolojik vatandaşlık, ekolojik vatandaşlık ölçeği, geçerlik, güvenilirlik.

Appendix 1 - Generated Path Diagram for the Recommended Model



## Appendix 2. Ecological Citizenship Scale

Final Scale Items	First Scale Items	Ecological Citizenship Scale
1.	3	Kıyafet satın alırken hangi ham maddeden (pamuk, akrelik polyester, yün vb.) üretildiğine dikkat ederim.
2.	5.	Dünyanın neresinde olursa olsun bir gölün kurummasından endişe duyarım.
3.	19.	Karşılaştığım çevre sorunlarını çözmek için dilekçe yazarım.
4.	9.	Ses kirliliğine neden olan kişi ve kuruluşları yetkililere şikâyet ederim.
5.	10.	Sokak hayvanlarının yiyecek ve içecek bulmasına yardım ederim.
6.	12.	Çevreye zarar veren bir termik santrale hangi şehirde olursa olsun karşı çıkarım.
7.	14.	Doğayı yakından tanımak için milli parkları ziyaret ederim.
8.	15.	Çevresel kampanyalara (mavi kapak toplama, imza, fidan bağıışı vb.) katılırım.
9.	36.	Satın alacağım ürünlerin GDO'lu olup olmadığına dikkat ederim.
10.	8.	Başka ülkelerde çıkan orman yangınları için de üzülürüm.
11.	21.	Dünyada açlık çeken ülkeler için gıda yardımı yaparım.
12.	25.	Temiz ve sağlıklı bir çevrede yaşamak için yerel yönetimlerden talepte (yeşil alan, çöp tenekesi, geri dönüşüm kutusu vb.) bulunurum.
13.	26.	Gereksiz bir harcama yaparken yoksul ülkelerin vatandaşlarını düşünürüm.
14.	31.	Merkezi ve yerel yönetimlerin çevre politikalarını araştırırım.
15.	32.	Dünyadaki birçok insanın temiz suya ulaşamadığını bildiğim için aşırı su tüketiminden kaçınırım.
16.	34.	Barınaklarda yaşayan sokak hayvanlarının yaşam koşullarını kontrol etmek için ziyarette bulunurum.
17.	35.	Çevre sorunlarını çözmek için kamuoyu oluşturmaya çalışırım.
18.	17.	Hayvanlara eziyet edenleri ilgili yerlere şikâyet ederim.
19.	37.	Alışveriş yapmadan önce ihtiyaç listesi hazırlarım.
20.	39.	Karşılaştığım çevre sorunları hakkında yerel gazetelere yazı yazarım.
21.	40.	Elektrikli bir ürün satın alırken enerji tüketim miktarını dikkate alırım.
22.	42.	Çevre sorunlarıyla ilgili yasal gösterilere katılırım.
23.	43.	Katkı maddesi içermeyen organik gıdalar tüketirim.
24.	44.	Yaşadığım şehir için yayımlanan hava kirliliği ölçüm sonuçlarını takip ederim.

### **Appendix 3- English Version of the Ecological Citizenship Scale**

#### **ITEMS**

1. When buying clothes I pay attention to which raw materials (cotton, acrylic polyester, wool, etc.) used in production.
2. I am concerned about the drying out of a lake, no matter where it is in the world.
3. I write a petition to solve my environmental problems.
4. I complain to people and organizations that cause noise pollution to the authorities.
5. I help the street animals to find food and drink.
6. I oppose a thermal power plant damaging the environments no matter which city it is located.
7. I visit national parks to get to know the nature closely.
8. I participate in environmental campaigns (collecting blue bottle cap, sign petition, donating seedlings, etc.).
9. I will pay attention to whether the products I buy will include GMO (Genetically Modified Organism).
10. I feel sorry for the forest fires also in other countries.
11. I make food aid for countries starving in the world.
12. In order to live in a clean and healthy environment, I ask for local authorities (green area, garbage can, recycling box, etc.).
13. I consider the citizens of poor countries when I spend irresponsibly.
14. I investigate the environmental policies of central and local authorities.
15. I avoid extreme water consumption because I know that many people in the world can not reach clean water.
16. I visit to check the living conditions of street animals living in shelters.
17. I try to create public opinion to solve environmental problems.
18. I complain animal persecutors to the concerned authorities.
19. I prepare a need-list before shopping.
20. I write articles about about environmental issues to local newspapers.
21. I consider the energy consumption of an electrical product when purchasing it.
22. I participate in legal demonstrations on environmental issues.
23. I consume organic foods that do not contain additives.
24. I follow the air pollution measurement results published for the city I live in.