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# Science teacher candidates' awareness and behaviors regarding biodiversity: Scale development study

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**Abstract**

The aim of this study was to develop a scale to determine the awareness and behavior levels of pre-service science teachers regarding biodiversity. A pool of 60 items for the measurement tool was created through a literature review conducted by the researcher. After obtaining expert opinions, the number of items was reduced to 56 and revised accordingly. The prepared scales were administered to 280 students at two public universities. Exploratory factor analysis (EFA) was conducted to assess the construct validity of the scale. The 'Biodiversity Awareness Measurement Tool' (BAMT) was finalized with 24 items based on the EFA results, while the 'Biodiversity Behavior Measurement Tool' (BBMT) was finalized with 25 items. After the reliability study, the overall Cronbach's alpha coefficient for BAMT was found to be .72, and for BBMT, it was .75. As a result of all these studies, a 5-point Likert-type scale consisting of 24 items prepared in 6 sub-dimensions to measure biodiversity awareness levels and a scale consisting of 25 items prepared in 7 sub-dimensions to measure biodiversity behavior levels were developed.

**Keywords:** biodiversity, awareness, behavior, teachers candidate

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## Fen bilgisi öğretmen adaylarının biyolojik çeşitlilik konusundaki farkındalık ve davranışları: Ölçek geliştirme çalışması

**Özet**

Bu araştırmanın amacı, fen bilgisi öğretmen adaylarının biyolojik çeşitlilik konusundaki farkındalık ve davranış düzeylerini belirlemeye yönelik bir ölçek geliştirmektir. Araştırmacı tarafından ilgili alan taraması yapılarak ölçme aracı için 60 maddelik madde havuzu belirlenmiştir. Alan uzman görüşü alındıktan sonra, madde sayısı 56 maddeye indirilerek yeniden düzenlenmiştir. Hazırlanan ölçek iki devlet üniversitesindeki 280 öğrenciye uygulanmıştır. Ölçeğin yapı geçerliliği için açımlayıcı faktör analizi yapılmıştır. “Biyolojik Çeşitlilik Farkındalık Ölçme Aracı” (BÇFÖA), yapılan açımlayıcı faktör analiziyle 24 madde olarak, “Biyolojik Çeşitlilik Davranış Ölçme Aracı” (BÇDÖA) ise yapılan açımlayıcı faktör analiziyle 25 maddelik son halini almıştır. Güvenirlik çalışması sonrasında da BÇFÖA’nın genel cronbach alfa katsayısının .72 olduğu, BÇDÖA’nın geneli için cronbach alfa katsayısının .75 olarak bulunmuştur. Tüm bu çalışmalar sonrasında biyolojik çeşitlilik farkındalık düzeylerini ölçmek için 6 alt boyutta hazırlanmış 24 maddeden oluşan ölçek ve biyolojik çeşitlilik davranış düzeylerini ölçen 7 alt boyutta hazırlanmış 25 maddeden oluşan 5’li likert türü ölçek geliştirilmiştir.

**Anahtar kelimeler:** biyolojik çeşitlilik, farkındalık, davranış, öğretmen adayları

## 1. Introduction

Biodiversity in a region is formed by the totality of ecosystems and ecological relationships. This diversity is vital for the existence of natural habitats, human life, and species in general. Turkiye is quite rich in terms of

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biodiversity, which constitutes an important part of our natural heritage. This natural wealth is thought to be due to the country's division into seven geographical regions. Each region has its unique climate, vegetation, elevation, landforms, soil diversity, lakes, rivers, and wetlands. Our biodiversity offers many benefits, including those related to health, medicine, nutrition, pharmacy, forestry, fishing, economy, industry, tourism, cultural values, and education. Most importantly, biodiversity is essential for the continuation of life. Therefore, the preservation of biodiversity is of great importance for future generations to witness and understand the species and ecosystems that constitute it. Preserving biodiversity is vital for leaving a balanced and healthy natural environment for future generations to develop.

Since humanity understood that it is the ruler of the world, the relationship that must be harmonious with its natural environment has been disrupted. In recent years, agricultural lands, forests, and consequently biodiversity have been destroyed to meet the housing needs of the growing population. Biodiversity has high cultural, economic, aesthetic, social, and ecological value and is under social and economic pressure [1]. Human demographic, financial, and political movements have caused changes, and these changes have affected biodiversity. As a result, biodiversity erosion has occurred. The extinction rate indicates biodiversity erosion. Research shows that an average of 10,000 to 30,000 species become extinct every year and that by 2050, 11% of the natural areas the world had in 2000 could be lost, 40% of agricultural land is at risk of overuse, and 60% of coral reefs could be gone by 2030 [2]. Humanity must slow down and/or stop biodiversity erosion to survive.

In Türkiye, factors threatening biodiversity include opening 2/B lands for construction, deforestation, and dams. Most 2/B areas are either forested or have natural vegetation, and since these lands are a boundary point between urbanization and natural habitats, opening them for construction further restricts the area of natural life and poses a significant threat to living organisms. At the same time, industrialization rapidly pollutes nature. For these reasons, there is a decrease and even extinction in plant and animal species whose natural habitats have been destroyed. The decrease and extinction of plant and animal species, which are of great importance to humans, indicate that biodiversity is not being preserved. Parallel to this, biodiversity has reached dangerous levels globally due to improvements in developing countries, rapid population growth, and the destruction of forests and arable land to raise the average standard of living [4]. Moreover, the desire of people to benefit from both the living and non-living elements of their natural environment for their nutrition and security needs has created various effects on the natural environment and biodiversity. As a result, environmental problems have increased rapidly. It is seen that the emergence of irreversible damage occurs by disrupting the food chain among living beings, the processes in the inanimate environment, and the interactions between living and inanimate elements. Among these are the known and unknown extinction of many plants, animals, and microorganisms, the migration of species to other areas, and the increase in spatial struggles among species in that area. As can be understood from this situation, one of the important environmental problems of our time is the loss of biodiversity, and one of the most significant reasons for this problem is humanity's indifference to this extinction. However, the damage caused by humans to their environment through conscious or unconscious actions does not appear all at once, so the danger is not realized. This situation increases the threat awaiting humanity [5].

Individuals remain indifferent to biodiversity issues unless these problems affect them directly and do not seek any solutions. Individuals must be aware that the damage they cause to nature will negatively affect biodiversity, show behaviors aimed at taking precautions against the problems that may arise, and develop solutions. For this, it is essential to raise individuals who are aware of biodiversity and exhibit positive behaviors towards it. The most effective solution for preserving biodiversity is to raise awareness about this issue among individuals and create a foundation for turning it into positive behavior. All of this is possible through education. Raising individuals who are aware of biodiversity issues and exhibit positive behaviors towards preserving and properly using biodiversity is among the aims of biodiversity education. At this point, it becomes increasingly important to use the results and recommendations from studies aimed at preserving biodiversity in biology education and environmental education to create awareness about biodiversity and eliminate behavioral pollution towards biodiversity [6].

To raise a generation that respects biodiversity preserves it, understands the need to sustain it, and passes it on from generation to generation, it is necessary first to instill awareness and positive behaviors in people. In this way, individuals who are aware of, respect, and ethically behave towards biodiversity can be raised. Biodiversity cannot be preserved only through behaviors. To protect biodiversity, it is necessary to establish bioethics-based, environment-centered biopolicies. Behaviors such as being aware of biodiversity and protecting and using it properly can be achieved through bioeducation. Since the factors negatively affecting biodiversity are human awareness and behavior patterns, these are an education problem. The primary activity in the learning process, which humans are continuously involved in throughout their lives, is education and training. In Turkiye, the primary aim of education should be to develop models and educational environments that will raise individuals who are creative, inquisitive, think critically, research, learn to learn, communicate, are proficient in technology, are friendly with knowledge, are sensitive to society and their environment, and have lifelong learning skills [7].

Any organism's activities, including its responses and movements in a particular situation, are defined as behavior. Behavior is the result of continuous interaction between personal and environmental variables. Environmental conditions shape behavior through learning, and the person's behavior also shapes the environment [8]. As individuals gain knowledge about the functioning of ecosystems and how human activities affect these systems, they exhibit more positive behaviors toward the environment [7]. Individuals who do not have sufficient knowledge about the

environment exhibit negative behaviors towards the environment, disrupting the natural balance and harming the environment [9]. Environmental behaviors can be influenced by socioeconomic conditions, the living environment, education level, gender, profession, and ecological knowledge [10]. A review of the literature shows that a series of studies have been conducted on stakeholders' knowledge levels and behavior tendencies towards biodiversity [11]. However, it is noticeable that studies related to awareness and behaviors towards biodiversity are more commonly conducted abroad, while such studies are scarce in our country. "Creating awareness" can lead to change if it is supported and combined with knowledge. Therefore, public awareness and knowledge level play a significant role in both combating climate change, which affects human life in various environmental, social, and economic ways, and preserving biodiversity, which is under severe threat. Increasing the awareness and knowledge level of individuals is very effective in achieving success in combating climate change and solving environmental problems on a global, national, and local scale. Individuals with increased consciousness and awareness levels can create public opinion on environmental and climate change issues, stand against anti-environmental decisions made by policymakers, and become one of the main actors in these issues [3].

Individuals who comprehend the concept of biodiversity are expected to protect, develop, and use the natural environment sustainably. To create awareness about biodiversity and encourage positive behaviors, educational practices should be designed to attract students' interest and encourage active participation in the learning process. Continuing the development of our country's biological wealth without causing harm is of great importance for future generations, with teacher candidates who will address large masses being trained with a consciousness of protection. The plant, animal, and microorganism species that makeup biodiversity, along with their varieties and communities, have a significant impact on maintaining the natural balance [12]. Educating conscious generations can ensure that such organisms continue to live well in the future. Therefore, studies that contribute to raising awareness about biodiversity and developing positive behaviors are important. It has been stated that the preservation of biodiversity is a promising frontier for behavioral sciences. To reduce the global (climate change) and local (economic development) threats to biodiversity caused by human activities, it is extremely important for people to have basic knowledge about biodiversity and its value and to exhibit appropriate behavior tendencies towards biodiversity and its values. Biodiversity can only be protected by people who can understand its importance, perceive the factors causing negative impacts, and know what can be done to protect it. The educators who ensure the formation of awareness about biodiversity and increase positive behavior levels are undoubtedly educators. It is also a fact that an ideal nature education that will effectively teach the impacts of damaging biodiversity, the importance of this biodiversity for our planet, and what can be done to protect it, and contribute to raising sensitive and conscious citizens, can only be provided by educators with sufficient knowledge on these subjects. It is stated that knowledge and sensitivities gained without awareness of biological and ecological diversity and without turning them into positive behaviors cannot be put into practice.

The awareness and behavior of teacher candidates who play a key role in educating young children are important. For students to be aware of the ecological and use values of biodiversity and to adopt behaviors that protect biodiversity, teachers who educate and prepare students for the future must be prepared and have the necessary and sufficient knowledge to be aware of the ecological and use values of biodiversity and to adopt behaviors that protect biodiversity. Since the extinction of biodiversity can have significant effects in various fields now and in the future, increasing individuals' awareness of these issues from primary education, even preschool, and having individuals in society who can make correct decisions about preserving biodiversity is undoubtedly closely related to the efforts of science teachers [13, 14]. In this context, this study is extremely important in determining the awareness and behavior levels of science teacher candidates who will work in middle schools regarding biodiversity and contributing to the preservation of sustainable biodiversity.

In the accessible sources, no scales have been developed for teacher candidates regarding Biodiversity Awareness and Behavior [7, 9, 10]. Thus, the primary aim of this research is to develop sufficient and reliable measurement tools to determine biodiversity awareness and behavior levels. In subsequent research, it is thought that using these measurement tools will contribute significantly to the studies [7-14]. Studies conducted with these aims can contribute to identifying science teachers' awareness and behavior levels on biodiversity issues and determining what needs to be done to address any deficiencies or misinformation during the professional education of teacher candidates.

## 2. Material and method

### *2.1. Preparation of the Measurement Tool*

In the development of the Biological Diversity Awareness Measurement Tool (BAMT) and Biological Diversity Behavior Measurement Tool (BBMT) ; (1) creating the item pool for the measurement tool, (2) seeking expert opinions, (3) pilot study phase, (4) calculating validity and reliability. Literature was reviewed on measurement tools related to biodiversity awareness and behavior levels suitable for the study's purpose. However, no measurement tool was found to determine the awareness and behavior levels of teacher candidates regarding biodiversity. From the literature, research generally focused on determining knowledge levels, attitudes, and literacy levels, but very few studies addressed the awareness and behavior dimensions. In addition, the sections of the questionnaires related to

biodiversity and the sections related to biodiversity in high school and middle school textbooks were examined. The 60 items prepared for the measurement tool were reduced to a total of 56 items, 30 items related to awareness and 26 items related to behavior, by consulting field experts. It was decided to use a Likert-type scale. Positive and negative items related to the attitude to be measured, developed by Likert, were presented to individuals.

The items of the biodiversity awareness measurement tool and biodiversity behavior measurement tool in the trial form were evaluated for content validity and suitability to the student level by consulting the opinions of three faculty members in elementary science education. Additionally, the measurement tools were presented to two faculty members in Turkish education to determine its comprehensibility and grammatical correctness. Long items were shortened, and sentences with grammatical errors were revised. Thirty (30) items related to awareness and 26 items related to behavior were used for the application.

### *2.2. Study Group and Data Collection Process*

The designed measurement tool form was applied face to face to a total of 280 randomly selected students studying at two state universities.

### *2.3. Data Analysis*

Exploratory factor analysis was conducted to reveal the construct validity of the BAMT and BBMT. For reliability, Cronbach α internal consistency coefficients were examined.

The prepared measurement tool consists of three parts. The first section includes 12 items covering demographic information. The second section contains a 30-item biodiversity awareness scale designed to measure participants' levels of awareness about biodiversity. The third section includes a 26-item biodiversity behavior scale to measure participants' levels of behavior related to biodiversity. A 5-point Likert scale format was chosen, with response options of 'Strongly Disagree,' 'Disagree,' 'Neutral,' 'Agree,' and 'Strongly Agree,' scored from 1 to 5, respectively (Table 1). Reverse coding was applied for negative items.

Table 1. Likert-type scale ıtem scoring key

| | Positive Questions | Negative Questions |
|---|---|---|
| Strongly Disagree | 1 | 5 |
| Disagree | 2 | 4 |
| Neutral | 3 | 3 |
| Agree | 4 | 2 |
| Strongly Agree | 5 | 1 |

## 3. Results

### *3.1. Content and Construct Validity*

Content validity is concerned with whether the measurement tool fully meets the quantitative and qualitative aspects of measuring the target behaviors [15]. The content validity of the measurement tool was evaluated considering the opinions of three faculty members in elementary science education. The suitability of content validity was decided. Then, exploratory factor analysis was applied to identify the factors among the variables. Item analysis was performed to test the relationship between the items in the measurement tool and the attitude to be measured. Pearson product-moment correlation coefficients were calculated to determine the relationship between each item in the measurement tool and the total score. Finally, the reliability coefficients (Cronbach Alpha) of the measurement tool and each factor were calculated separately [16].

#### *3.1.2. Development Study of the Biological Diversity Behavior Level Measurement Tool*

Analyses were conducted on 280 individuals in the biological diversity behavior level measurement tool development application study. First, it was examined whether the sample showed a normal distribution. The findings are presented in Table 2. The data obtained from the pilot application of the BBMT were analysed. The scoring for responses to negative items was adjusted as “1-5; 2-4; 3-3; 4-2; 5-1”. The total score obtained by each student with the measurement tool was calculated, and the normal distribution graph was examined (Figure 1).

Table 2. Skewness and kurtosis values of the biological diversity behavior level measurement tool

| Biological Diversity Behavior Level | | |
|---|---|---|
| Skewness | -.02 | .14 |
| Kurtosis | -.12 | .29 |

Table 2 shows the skewness and kurtosis values of the biological diversity behavior level measurement tool. Skewness values range from -.02 to .14, and kurtosis values range from -.12 to .29. According to George and Mallery (2003), skewness and kurtosis values between (+2) /(-2) indicate normal distribution. In addition, to test the normality of the distribution, a histogram graph is provided in Figure 1.

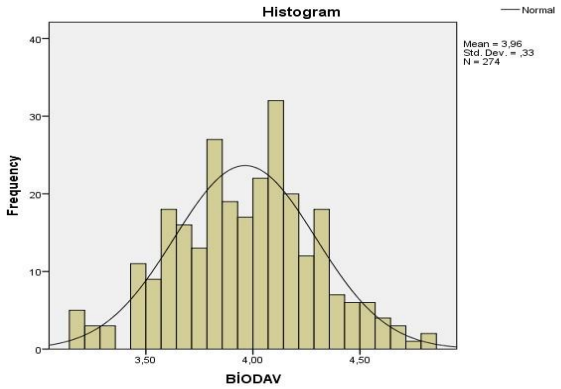


Figure 1. Normal distribution graph of the biological diversity behavior level

The average value calculated according to the given answers shows a normal distribution. In the research, first, the construct validity of the biological diversity behavior measurement tool was performed. Based on the literature and expert opinions, it was decided to perform construct validity (EFA) for the item pool. Before performing EFA, it is necessary to investigate whether the data set is suitable for factor analysis. It is necessary to test the sample size for EFA. One of the methods used to determine whether the sample is suitable for data analysis is the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Bartlett Sphericity test of sphericity (Table 3).

Table 3. Results of the kaiser-meyer-olkin and bartlett sphericity tests

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO): .77 | | |
|---|---|---|
| Bartlett's Test of Sphericity | $X^2$ | 1564.70 |
| | sd | 300 |
| | p | .000 |

The KMO measure of sampling adequacy value was 0.77. The calculated Bartlett Sphericity Test for the same data was 1564.70 and was significant at the 0.001 level ($X^2(300)=1564.701$). These findings show that the sample size and correlations between items were adequate, thus the data can be subjected to factor analysis [17].

After determining the sample size's suitability for factor analysis, a "Scree Plot" graph was drawn to see the number of factors in the measurement tool. The Scree plot is shown in Figure 2.

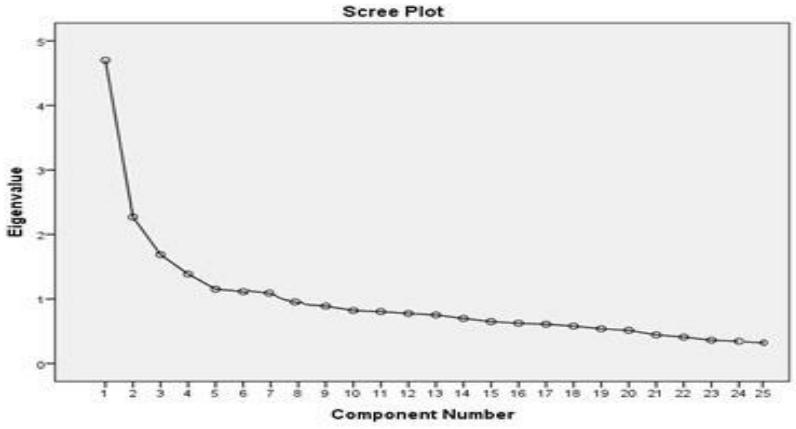


Figure 2. Scree plot graph

When the Scree Plot graph is examined, it is seen that the eigenvalue of the measurement tool falls below eigene value of 1 after the 7th factor. This situation shows that the measurement tool consists of 7 factors.

The data of the 26 items in the biodiversity behavior level measurement tool were subjected to exploratory factor analysis to identify the primary factors measured. In determining the primary factors, there was no restriction on the number of factors, and the principal components factor analysis and varimax rotation method were used. Validity studies revealed that the measurement tool had a seven-factor structure with an eigenvalue greater than 1. The results are presented in Table 4.

Table 4. Analysis for determining the factor structure of the measurement tool

| Factor No | Eigenvalues | Percentage of Variance | Cumulative Percentage of Variance |
|---|---|---|---|
| 1 | 3.64 | 14.57 | 14.57 |
| 2 | 3.51 | 14.06 | 28.64 |
| 3 | 1.88 | 7.53 | 36.17 |
| 4 | 1.46 | 5.85 | 42.03 |
| 5 | 1.22 | 4.88 | 46.91 |
| 6 | 1.15 | 4.60 | 51.52 |
| 7 | 1.01 | 4.05 | 55.57 |
| 8 | .98 | 3.95 | |

The measurement tool consists of a seven-factor structure explaining 55.58% of the total variance. The varimax rotation method was used to determine which item fell under which factor, and the distribution of the items was determined. The findings are presented in Table 5.

Table 5. Post-rotation load values of ıtems in the measurement tool and ıtems in the factors

| Item No | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 | Factor 7 |
|---|---|---|---|---|---|---|---|
| 16 | .892 | | | | | | |
| 15 | .873 | | | | | | |
| 13 | .753 | | | | | | |
| 14 | .461 | | | | | | |
| 24 | | .772 | | | | | |
| 25 | | -.755 | | | | | |
| 8 | | .615 | | | | | |
| 18 | | .611 | | | | | |
| 19 | | | .669 | | | | |
| 20 | | | .606 | | | | |
| 26 | | | .589 | | | | |
| 17 | | | -.564 | | | | |
| 11 | | | | .763 | | | |
| 12 | | | | .659 | | | |
| 9 | | | | .564 | | | |
| 3 | | | | .408 | | | |
| 22 | | | | | .712 | | |
| 21 | | | | | .666 | | |
| 23 | | | | | .485 | | |
| 6 | | | | | | -.646 | |
| 7 | | | | | | .629 | |
| 2 | | | | | | .528 | |
| 4 | | | | | | .460 | |
| 1 | | | | | | | .752 |
| 5 | | | | | | | .742 |

From the results, the factor loadings of the biological diversity behavior level measurement tool range from .40 to .89. According to Büyüköztürk [18], the load values of the items in the factors they belong to should be high. The difference between the highest load value of an item in the factors and the next highest load value should be as large as possible. It is recommended that this difference between the two high values be at least .10. Otherwise, the item is removed from the measurement tool. In this study, the 10th item was removed from the measurement tool due to the difference between the load values under two different factors being less than .10. According to the literature, items can be used if the factor loadings are greater than .30 [19]. Thus, the total number of items became 25.The names of the factors resulting from the interpretation of the items that constituted them are given in Table 6.

Table 6. Names of the sub-factors of the biological diversity behavior level measurement tool

| Factor No | Sub-Factor Name | Number of Items |
|---|---|---|
| 1 | Biodiversity Protection Behavior | 4 |
| 2 | Economic Value of Biodiversity | 4 |
| 3 | Ethical Value of Biodiversity | 4 |
| 4 | Threat Elements of Biodiversity | 4 |
| 5 | Political and Legal Behaviors of Biodiversity | 3 |
| 6 | Usage Value of Biodiversity | 4 |
| 7 | Individual and Societal Persuasion of Biodiversity | 2 |
| | Total | 25 |

In the first factor, items 12, 13, 14, and 15; in the second factor, items 8, 17, 23, and 24; in the third factor, items 16, 18, 19, and 25; in the fourth factor, items 3, 9, 10, and 11; in the fifth factor, items 20, 21, and 22; in the sixth factor, items 2, 4, 6, and 7; and in the seventh factor, items 1 and 5 are included.

*3.1.3. Development Study of the Biological Diversity Awareness Level Measurement Tool*

The data obtained from the pilot application of the BAMT were analysed. The scoring for responses to negative items was adjusted as "1-5; 2-4; 3-3; 4-2; 5-1". The total score obtained by each student with the measurement tool was calculated, and the normal distribution graph was examined (Figure 3).

Analyses were conducted on 280 individuals in the biological diversity awareness level measurement tool development application study. First, it was examined whether the sample showed a normal distribution. The findings related to this situation are presented in Table 7.

Table 7. Skewness and kurtosis values of the biological diversity awareness level measurement tool

| | Biological Diversity Awareness Level | |
|---|---|---|
| Skewness | -.15 | .14 |
| Kurtosis | -.43 | .29 |

The skewness values range from -.15 to .14, and kurtosis values range from -.43 to .29 According to [20], skewness and kurtosis values between (+2) /(-2) indicate normal distribution. In addition, to test the normality of the distribution, a histogram graph is provided.

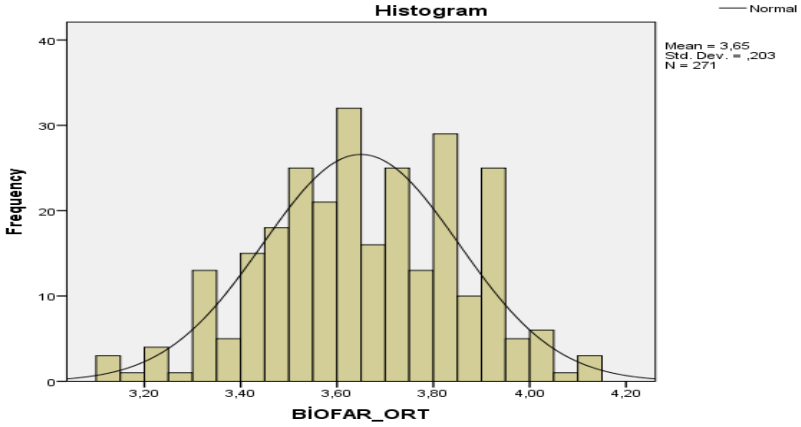


Figure 3. Normal distribution graph of the biological diversity awareness level

The biodiversity awareness data approximately shows a normal distribution in the histogram. After determining that the data showed a normal distribution, it was tested whether the sample was suitable for factor analysis. The results of the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and Bartlett Sphericity test of sphericity are presented in Table 8.

Table 8. Results of the kaiser-meyer-olkin and bartlett's test of sphericity

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO): .79 | | |
|---|---|---|
| Bartlett's Test of Sphericity | $X^2$ | 1333.97 |
| | sd | 276 |
| | p | .000 |

From the results, the calculated KMO suitability measure value was 0.79. The calculated Bartlett's Test of Sphericity for the same data was 1333.97 and was significant at the 0.001 level (X2276=1333,974). These findings show that the data can be subjected to factor analysis [17].

After determining the sample size's suitability for factor analysis, a "Scree Plot" graph was drawn to see the number of factors in the measurement tool. The Scree plot is shown in Figure 4.

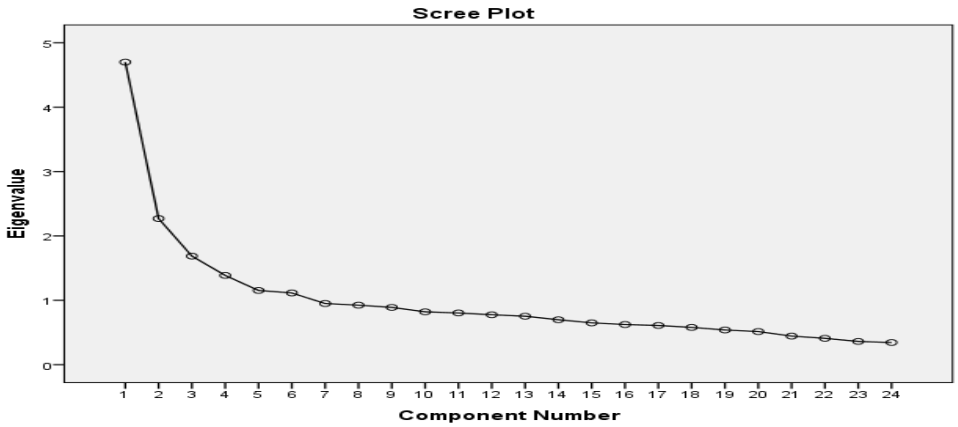


Figure 4. scree plot graph

When the Scree Plot graph is examined, it is seen that the eigenvalue of the measurement tool falls below eigene value of 1 after the 6$^{th}$ factor. This situation shows that the measurement tool consists of 6 factors.

For the development study of the biological diversity awareness level measurement tool, data related to the 30 items in the pilot application were subjected to exploratory factor analysis to identify the primary factors measured. Principal components factor analysis and varimax rotation method were used. Validity studies revealed that the measurement tool had a six-factor structure with an eigenvalue greater than 1. The results are presented in Table 9.

Table 9. Analysis for determining the factor structure of the measurement tool

| Factor No | Eigenvalues | Percentage of Variance | Cumulative Percentage of Variance |
|---|---|---|---|
| 1 | 4.69 | 19.58 | 19.58 |
| 2 | 2.27 | 9.458 | 29.03 |
| 3 | 1.68 | 7.02 | 36.06 |
| 4 | 1.38 | 5.77 | 41.84 |
| 5 | 1.15 | 4.80 | 46.64 |
| 6 | 1.11 | 4.64 | 51.28 |
| 7 | .95 | | |

The measurement tool consists of a six-factor structure explaining 51.29% of the total variance. The varimax rotation method was used to determine which item fell under which factor, and the distribution of the items was determined. The findings related to this situation are presented in Table 10.

The factor loadings of the biological diversity awareness level measurement tool range from .372 to .752. Items 5, 9, 17, 25, 28, and 29 were removed from the measurement tool due to loadings below .30. Thus, the total number of items became 24. The names of the factors resulting from the interpretation of the items that constituted them are given in Table 11.

In the first factor, items 14, 15, 17, 18, 19, 20, and 21; in the second factor, items 6, 7, 8, 12, and 24; in the third factor, items 2, 3, and 5; in the fourth factor, items 1, 4, 11, and 22; in the fifth factor, items 9, 10, and 23; and in the sixth factor, items 13 and 16 are included.

Table 10. Post-Rotation load values of ıtems in the measurement tool and ıtems in the factors

| Item No | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 |
|---|---|---|---|---|---|---|
| 21 | .616 | | | | | |
| 20 | -.614 | | | | | |
| 22 | .589 | | | | | |
| 18 | .583 | | | | | |
| 23 | .570 | | | | | |
| 16 | .494 | | | | | |
| 24 | .429 | | | | | |
| 7 | | .675 | | | | |
| 10 | | .657 | | | | |
| 8 | | .657 | | | | |
| 30 | | .599 | | | | |
| 14 | | .554 | | | | |
| 3 | | | .749 | | | |
| 2 | | | .735 | | | |
| 6 | | | .608 | | | |
| 4 | | | | -.705 | | |
| 1 | | | | .627 | | |
| 26 | | | | .413 | | |
| 13 | | | | .372 | | |
| 11 | | | | | .752 | |
| 12 | | | | | .634 | |
| 27 | | | | | -.436 | |
| 19 | | | | | | .704 |
| 15 | | | | | | -.614 |

Table 11. Names of the sub-factors of the biological diversity awareness measurement tool

| Factor No | Sub-Factor Name | Number of Items |
|---|---|---|
| 1 | Ecological Function | 7 |
| 2 | Species Diversity | 5 |
| 3 | Usage Value of Biodiversity | 3 |
| 4 | Elements of Biodiversity | 4 |
| 5 | Biodiversity Loss | 3 |
| 6 | Current State of Biodiversity | 2 |
| | Total | 24 |

*3.2. Reliability*

Cronbach Alpha reliability coefficients were examined for the reliability of both measurement tools. The Cronbach Alpha coefficients for each factor and the overall measurement tool from the pilot application results are given in Table 12 and Table 13.

Table 12: Cronbach alpha values of biodiversity behavior factors

| Sub-Factor Name | Number of Items | Cronbach Alpha Value |
|---|---|---|
| Biodiversity Protection Behavior | 4 | .76 |
| Economic Value of Biodiversity | 4 | .73 |
| Ethical Value of Biodiversity | 4 | .78 |
| Threat Elements of Biodiversity | 4 | .78 |
| Political and Legal Behaviors of Biodiversity | 3 | .71 |
| Usage Value of Biodiversity | 4 | .73 |
| Individual and Societal Persuasion of Biodiversity | 2 | .76 |
| Total | 25 | |
| Overall Measurement Tool | | .75 |

The reliability coefficients for the overall biodiversity behavior measurement tool and its sub-dimensions indicate that the measurement tool is reliable. The general Cronbach Alpha coefficient for the biological diversity behavior level measurement tool was found to be .75, with factor coefficient values ranging from .71 to .78.

Table 13: Cronbach Alpha Co-Efficients of Biodiversity Awareness Factors

| Factor Name | Number of Items | Cronbach Alpha Value |
|---|---|---|
| Ecological Function | 7 | .70 |
| Species Diversity | 5 | .72 |
| Usage Value of Biodiversity | 3 | .71 |
| Elements of Biodiversity | 4 | .73 |
| Biodiversity Loss | 3 | .72 |
| Current State of Biodiversity | 2 | .74 |
| Total | 24 | |
| Overall Measurement Tool | | .72 |

The reliability coefficients for the overall biodiversity awareness measurement tool and its sub-dimensions indicate that the measurement tool is reliable. A single α value can be determined for each item, or an average α value can be obtained for all items in the measurement tool. The α value obtained for all items indicates the total reliability of the questionnaire. The general Cronbach Alpha coefficient of the biodiversity awareness level measurement tool was found to be .72, with factor coefficient values ranging from .70 to .74.

## 4. Discussion and Conclusion

A literature review was conducted on measurement tools related to biodiversity awareness and behavior levels suitable for the study's purpose. However, no measurement tool was found to determine the awareness and behavior levels of teacher candidates regarding biodiversity. Therefore, previous studies on the environment and biodiversity were reviewed and evaluated. Additionally, the sections of the questionnaires related to biodiversity and the parts related to biodiversity in high school and middle school textbooks were examined. As a result of all these reviews, a total of 56 items, 30 related to awareness and 26 related to behavior, were prepared by the researcher, and a Likert-type measurement tool was prepared.

According to Büyüköztürk [18], factor analysis is a statistical technique that aims to bring together a large number of related variables and express them with a much smaller number of conceptually meaningful variables such as factors or dimensions. The sample size for exploratory factor analysis was determined using the Kaiser-Meyer-Olkin (KMO) sample adequacy test. According to Şencan [21], if the value obtained from the KMO test is less than .50, factor analysis cannot be performed.

In the analyses conducted within the scope of the Biological Diversity Awareness and Behavior Scales, the calculated KMO suitability measure value for the Biological Diversity Behavior Scale was 0.77. Bartlett's Test of Sphericity was used to determine whether the data set was suitable for factor extraction. If the significance value in Bartlett's Test of Sphericity is greater than .05, it is interpreted that no factors can be extracted from the data set, and factor analysis cannot be performed [22]. The result of Bartlett's Test for the Biological Diversity Behavior Scale showed that the data set was suitable for factor analysis ($p<.001$). After determining that the sample size was sufficient and the data set was suitable for factor extraction, exploratory factor analysis was performed using the principal components analysis method. According to Tabachnick and Fidell [23], principal components analysis allows for the extraction of the highest variance from the data set.

For the BBMT scale, the calculated Bartlett's Test of Sphericity for the same data was 1564.70 and was significant at the 0.001 level. These findings show that the data can be subjected to factor analysis [21]. Data related to the 26 items in the biodiversity behavior level measurement tool were subjected to exploratory factor analysis to identify the primary factors measured. There was no restriction on the number of factors in determining the primary factors, and the principal components factor analysis and varimax rotation method were used. Validity studies revealed that the measurement tool had a seven-factor structure with an eigenvalue greater than 1. The factor loadings of the biodiversity behavior level measurement tool ranged from .40 to .89. According to Büyüköztürk [22], the load values of the items in the factors they belong to should be high. The difference between the highest load value of an item in the factors and the next highest load value should be as large as possible. It is recommended that this difference between the two high values be at least 10. Otherwise, the item is removed from the measurement tool. In this study, the 10th item was removed from the measurement tool due to the difference between the load values under two different factors being less than.10. According to the literature, items can be used if the factor loadings are greater than .30 [23]. Thus, the total number of items became 25.

Seven factors were determined for the biodiversity behavior measurement tool. These are: the first factor, biodiversity protection behavior; the second factor, economic value of biodiversity; the third factor, ethical value of biodiversity; the fourth factor, threat elements of biodiversity; the fifth factor, political and legal behaviors of

biodiversity; the sixth factor, usage value of biodiversity; and the seventh factor, individual and societal persuasion of biodiversity.

For the Biological Diversity Awareness Scale, the calculated KMO suitability measure value was 0.79. The calculated Bartlett's Test of Sphericity for the same data was 1333.97 and was significant at the 0.001 level ($X^2(276)=1333.974$). These findings show that the data can be subjected to factor analysis [21]. When the Scree Plot graph was examined, it was seen that the eigenvalue of the measurement tool fell below 1 after 6 factors. This situation shows that the measurement tool consists of 6 factors.

Data related to the 30 items were subjected to exploratory factor analysis to identify the primary factors measured. Principal components factor analysis and varimax rotation method were used. Validity studies revealed that the measurement tool had a six-factor structure with an eigenvalue greater than 1. The measurement tool consists of a six-factor structure explaining 51.29% of the total variance. The varimax rotation method was used to determine which item fell under which factor, and the distribution of the items was determined. The factor loadings of the biological diversity awareness measurement tool ranged from .372 to .752. Items with loadings below .30 were removed from the measurement tool. Thus, the total number of items became 24.

Six factors were determined for the biodiversity awareness measurement tool. These are: the first factor, ecological function; the second factor, species diversity; the third factor, usage value; the fourth factor, elements of biodiversity; the fifth factor, biodiversity loss; and the sixth factor, current state of biodiversity. Measurement tools with high consistency among the items that constitute them are reliable measurement tools [24]. For the reliability of both measurement tools, Cronbach Alpha coefficients were examined. The α value obtained for all items indicates the total reliability of the questionnaire, and the general acceptance is that this value should be .70 or higher.

In the research, the general Cronbach Alpha coefficient for the biodiversity awareness measurement tool was found to be .72. Additionally, the Cronbach Alpha coefficients for the six dimensions of the scale were as follows: ecological function dimension, .70; species diversity dimension, .72; usage value dimension, .71; elements of biodiversity dimension, .73; biodiversity loss dimension, .72; and current state of biodiversity dimension, .74.

In the research, the general Cronbach Alpha coefficient for the biodiversity behavior measurement tool was found to be .75. Additionally, the Cronbach Alpha coefficients for the seven dimensions of the scale were as follows: biodiversity protection behavior dimension, .76; economic value of biodiversity dimension, .73; ethical value of biodiversity dimension, .78; threat elements of biodiversity dimension, .78; political and legal behaviors of biodiversity dimension, .71; usage value of biodiversity dimension, .73; and individual and societal persuasion of biodiversity dimension, .76.

The developed scale does not have to be used as a whole scale, as done in similar scales [25]. Each sub-dimension of the scale allows for separate evaluation within itself.

As a result, it was concluded that both the Biological Diversity Awareness Measurement Tool and the Biological Diversity Behavior Measurement Tool are valid and reliable measurement tools.

The primary purpose of this study is to enable other researchers to use the developed scale, whether with all dimensions or preferred sub-dimensions, for any region or study group. Measuring the awareness and behavior of the chosen study group on biodiversity, and then making recommendations based on the findings to conduct effective studies and find solutions, is seen as a very important step in addressing the issue.

## References

[1] Edwards, P. J. & Abivardi, C (1998). The value of biodiversity: Where ecology and economy blend. *Biological Conservation*, 83(3), 239-246.

[2] Mccoy, W. M., McCoy, A. K. & Levey, J. D., (2007). Teaching Biodiversity to Students in Inner City & Under-Resourced Schools. *The American Biology Teacher*, 69(8), 473-476. https://doi.org/10.1662/0002-7685(2007)69[473]2.0.CO;2

[3] Ataklı, G., & Kuran, H. (2022). İklim değişikliği farkındalık ölçeğinin geliştirilmesi. *Biological Diversity and Conservation, 15*(2), 150–161. https://doi.org/10.46309/biodicon.2022.1079715

[4] Derman, M., Çakmak, M., Yaşar, M. D., Kızılaslan., A. & Gürbüz, H. (2013). Biyoçeşitlilik konusunda yapılan çalışmalar ve öğretim programlarında biyoçeşitliliğin değerlendirilmesi. *Journal of Research in Education and Teaching*, 2(3), 57-66.

[5] Barker, S. & Ellıot, P. (2000) "Planning a Skills-Based Resource for Biodiversity Education", *Journal of Biological Education*, 34(3), 123-127. https://doi.org/10.1080/00219266.2000.9655701

[6] Alpagut, B. & Karataş, A. (2014). İçerik ve tarihsel gelişimi açısından çevre eğitimi. H. Reyhan, A. Mutlu, H. H. Doğan ve A. S. Reyhan (Ed.), Sosyal Çevre Bilimleri içinde (s.405-428). Ankara: Siyasal Kitabevi.

[7] Pe'er, S., Goldman, D. & Yavetz, B. (2007). Environmental literacy in teacher training: Attitudes, knowledge, and environmental behavior of beginning students. *The Journal of Environmental Education*, 39, 45-59. https://doi.org/10.3200/JOEE.39.1.45-59

[8] Atkinson, R. L., Atkinson, R. C., Smith, E. E., Bem, D. J., & Nolen-Hoeksema, S. (2002). Psikolojiye Giriş (Çev. Yavuz Alogan). Baskı, Ankara: Arkadaş Yayınları.

[9] Timur, S., Timur, B. & Yılmaz, Ş. (2012). Fen ve teknoloji öğretmenleri ve öğretmen adaylarının çevreye yönelik davranışlarının incelenmesi. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi*, 32(3), 777-793.

[10] Alp, E.,Ertepınar, H., Tekkaya, C. & Yılmaz, A. (2008). A survey on Turkish elementary school students' environmental friendly behaviours and associated variables. *Environmental Education Research*, 14 (2), 129–143. https://doi.org/10.1080/13504620802051747

[11] Sim, G. (2015). Learning about biodiversity: investigating children's learning at a museum, environment centre and a live animal show, *UCL Institute of Education*.

[12] Sımsek, M., Kocataş, H., & Cobanoglu, F. (2010). Table fig (Ficus carica L.) selection in Midyat district of Mardin province. *Selcuk Journal of Agriculture and Food Sciences*, 24(3), 75-78.

[13] Nielsen, K. S., Marteau, T. M., Bauer, J. M., Bradbury, R. B., Broad, S., Burgess, G., ... Balmford, A. (2021). Biodiversity conservation as a promising frontier for behavioural science. *Nature Human Behaviour*, 5(5), 550-556. https://doi.org/10.1038/s41562-021-01109-5

[14] Robles-Moral, F. J., Fernández-Díaz, M., & Ayuso-Fernández, G. E. (2022). What do pre-service preschool teachers know about biodiversity at the level of organisms? Preliminary analysis of their ability to identify vertebrate animals. *Sustainability*, 14(18), 11406. https://doi.org/10.3390/su141811406

[15] Balcı, A. (2015). Sosyal Bilimlerde Araştırma Yöntem Teknik ve İlkeler (11. Baskı). Ankara: Pegem Akademi Yayıncılık.

[16] Şener, N., & Erol, T. A. Ş. (2016). Öğrencilerin Fen Bilimlerine İlişkin Tutumlarını Belirlemeye Yönelik Bir Ölçek Geliştirme Çalışması. *Ordu Üniversitesi Sosyal Bilimler Enstitüsü Sosyal Bilimler Araştırmaları Dergisi*, 6(14), 278-300.

[17] Hinkin, T.R. (1995). A review of scale development practices in the study of organisations. *Journal of Management*, 21 (5) , 967-988. https://doi.org/10.1177/014920639502100509

[18] Büyüköztürk, Ş. (2002). Faktör analizi: Temel kavramlar ve ölçek geliştirmede kullanımı. Kuram ve uygulamada eğitim yönetimi, 32(32), 470-483.

[19] Kline, P. (1994). An easy guide to factor analysis. London: Routledge https://doi.org/10.4324/9781315788135

[20] George, D., & Mallery, P. (2003). SPSS for Windows step by step: A simple guide and reference 11.0 update (4th ed.). Boston: Pearson Education, Inc. https://doi.org/10.4324/9781003205333

[21] Şencan, H. (2005). Güvenilirlik ve Geçerlilik. Ankara: Seçkin Yayıncılık.

[22] Çokluk, Ö., Şekercioğlu, G. & Büyüköztürk, Ş. (2014). Sosyal Bilimler İçin Çok Değişkenli İstatistik: SPSS ve LISREL Uygulamaları. Ankara: Pegem Akademi.

[23] Tabachnick, B. G. & Fidell, L. S. (2007). Anova Kullanan Deneysel Tasarımlar. Belmont, CA: ThomsonBrooks-Cole.

[24] Yaşar, M. (2014). İstatistiğe Yönelik Tutum Ölçeği: Geçerlilik ve Güvenirlik Çalışması. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 36 (36), 59-75.

[25] Tuncer, N. & Avcı, N. (2019). Okul öncesi öğretmenlerinin çocukların yürütücü işlevlerini destekleyen stratejileri kullanma yeterlilikleri ölçeğinin geliştirilmesi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, (52), 212-236. https://doi.org/10.21764/maeuefd.552000

**Ek 1.** Biyolojik Çeşitlilik Farkındalık ve Davranış Ölçme Araçları

| **KİŞİSEL BİLGİ FORMU** | |
|---|---|
| **Tanımlayıcı Bilgiler** | **Açıklamalar ve seçenekler** |
| 1. Cinsiyetiniz | ☐ Kadın ☐Erkek |
| 2. Yaşınız: | |
| 3.Sınıfınız: | ☐ 1. Sınıf ☐2. Sınıf ☐3. sınıf ☐4. sınıf |
| 4.Ailenizin Gelir durumu: | ☐1000 TL"den az☐1000-1999 TL arası ☐2000-2999 TL arası ☐3000-3999 TL arası ☐4000 TL"den fazla |
| 5. Lisans öğreniminiz süresince biyolojik çeşitlilik ile ilgili bir ders aldınız mı? (Cevabınız hayır ise7. 8. ve 9. soruyu geçiniz). | ☐ Evet ☐Hayır |
| 6.Lisans öğreniminizde biyolojik çeşitlilik ile ilgili dersi kaçıncı sınıfta aldınız? | ☐ 1. sınıf ☐2. Sınıf ☐3. sınıf ☐4. sınıf |
| 7. Lisans öğreniminizde gördüğünüz biyolojik çeşitlilik ile ilgili dersin niteliğinden ve neler öğrendiğinizden kısaca bahsediniz. | |
| 8. Biyolojik çeşitlilik konuları ile ilgili en çok yararlandığınız kaynak | ☐ İnternet ☐Dergi-Gazete ☐Kitap<br>☐ TV- Radyo ☐Diğerleri ..... |
| 9. Biyolojik çeşitlilik ile ilgili olarak yapılan herhangi bir etkinliğe katıldınız mı? Yanıtınız evet ise kısaca bilgi veriniz (Etkinliğin adı. yeri. tarih, düzenleyen kurum vb.) | ☐ Evet ☐Hayır |
| 10. Biyolojik çeşitlilik konularının verildiği bir hizmet içi eğitim almak ister misiniz? | ☐ Evet ☐Hayır |
| 11- Biyolojik çeşitliliğin dört temel öğesini yazınız. | a). .....<br>b). .....<br>c). .....<br>d). ..... |
| 12- Biyolojik çeşitlilik ile alakalı ilgi ve bilgi durumunuzu aşağıdaki cümlelerden hangisi karşılamaktadır. | a- Biyolojik çeşitlilik ve faydaları hakkında az da olsa bilgim var.<br>b- Biyolojik çeşitlilik hakkında bilgi edinmeye istekliyim ve biyolojik çeşitliliğin faydaları hakkında yeterli bilgiye sahip olduğumu düşünüyorum.<br>c- Biyolojik çeşitlilik ve faydaları hakkında yeterince bilgim yok.<br>d- Biyolojik çeşitlilik ile bilgi sahibi olmak istemiyorum<br>e- Fikrim yok |

1. Her bir ifadeyi okuduktan sonra, buna ne derecede katıldığınızı ya da katılmadığınızı liste üzerinde ayrılan yere uygun şekilde işaretleyiniz. Bir ifadeyi okuduktan sonra aklınıza ilk geleni işaretleyiniz. İşaretsiz ifade bırakmayınız. Size verilen liste üzerine adınızı yazmayınız, kimliğinizi belirtecek herhangi bir işaret koymayınız.

| Biyolojik Çeşitlilik Farkındalık Ölçeği | **Tamamen Katılıyorum** | **Katılıyorum** | **Kararsızım** | **Katılmıyorum** | **Tamamen Katılmıyorum** |
|---|---|---|---|---|---|
| 1. Biyolojik çeşitliliğin, madde değişimi, suyun temizlenmesi, toprağın oluşumu vb. ekolojik işlevlerinin de olduğunun farkındayım. | | | | | |
| 2. Biyolojik çeşitliliğin, besin için biyolojik kaynaklar, tıp ve insanların günlük hayattaki ihtiyaçlarının ham maddelerinin oluşturulması vb. görevlerinin de olduğunu bilirim. | | | | | |
| 3. Biyolojik çeşitliliğin, türlerin yaban formlarının yanı sıra ıslah edilmiş türlerin çeşitliliğinden de oluştuğunu bilirim. | | | | | |
| 4. Biyolojik çeşitliliğin, genetik, tür ve ekosistem çeşitliliği olmak üzere üç kısımdan oluştuğunun farkındayım. | | | | | |
| 5. Ziraat alanında kullanılan bitkilerin genetik çeşitliliğinde büyük oranda kayıp olduğunu bilirim. | | | | | |
| 6. Nesli tükenen bir türün tekrar yeniden oluşacağının farkındayım. | | | | | |
| 7. Bitki ve hayvan tür çeşitliliğinin yeryüzünde eşit bir şekilde dağılım gösterdiğini bilirim. | | | | | |
| 8. Biyolojik çeşitliliğin sadece canlıların sınıflandırılmasını kapsamadığını bilirim. | | | | | |
| 9. Bazı canlıların insanlar için faydalıyken bazılarının insanlar için zararlı olduğunu bilirim. | | | | | |
| 10. Bilinçsiz tarımsal faaliyetlerin (bilinçsiz sulama yöntemleri, kimyasal ve gübrelerin kullanılması vb.) toprak ekosistemini olumsuz etkileyeceğinin farkındayım. | | | | | |
| 11. Türlerin yarıdan fazlasının tropikal ormanlarda yaşadığının farkındayım. | | | | | |
| 12. Bir tür içerisindeki bireylerin her birinin genetik yapılarının aynı olmadığını bilirim. | | | | | |
| 13. Mercan kayalıklarının biyolojik çeşitlilik açısından tropikal ormanlar kadar zengin olmadığını bilirim. | | | | | |
| 14. Tür çeşitliliğindeki azalmadan dolayı ekosistemdeki işlevsel çeşitliliğin azalacağı hakkında bilgi sahibiyim. | | | | | |
| 15. Kendi aralarında çiftleştiklerinde sağlıklı ve doğurgan bireyler veren benzer özellikteki canlıların tür olduğu hakkında bilgi sahibiyim. | | | | | |
| 16. Kelaynak, yaz ördeği ve yılan kartalının nesli tükenme tehlikesiyle karşı karşıya olan canlı türlerinin arasında olduğunun farkındayım. | | | | | |
| 17. Bir popülasyonda birden fazla tür olabileceğinin bilincindeyim. | | | | | |
| 18. Bir ekosistemin canlı faktörlerini mikroskobik canlılar, mantarlar, bitkiler ve hayvanların oluşturduğunu bilirim. | | | | | |
| 19. Kaktüs bitkisinin çölde; kutup ayısının ise kutuplarda yaşamasına etki eden faktörlerin başında sıcaklık ve suyun geleceğinin farkındayım. | | | | | |
| 20. Bir canlı türünün doğal olarak yaşadığı ve ürediği yerin habitat olduğu hakkında bilgi sahibiyim. | | | | | |
| 21. Deniz ekosistemlerinde tuz oranının, sıcaklığın ve ışık miktarının hayvan çeşitliliğini belirleyeceğini bilirim. | | | | | |
| 22. Birçok besin zincirinin bir araya gelerek daha karmaşık yapılı olan besin ağını oluşturacağını bilirim. | | | | | |
| 23. Doğal seçilim ile ortama uyum sağlayamayan bireylerin yaşama şansının olmadığının farkındayım. | | | | | |
| 24.Dünya yüzeyindeki türlerin toplam sayısının azalmakta olduğunu bilirim. | | | | | |

2. Her bir ifadeyi okuduktan sonra, buna ne derecede katıldığınızı ya da katılmadığınızı liste üzerinde ayrılan yere uygun şekilde işaretleyiniz. Bir ifadeyi okuduktan sonra aklınıza ilk geleni işaretleyiniz.

İşaretsiz ifade bırakmayınız. Size verilen liste üzerine adınızı yazmayınız, kimliğinizi belirtecek herhangi bir işaret koymayınız.

| Biyolojik Çeşitlilik Davranış Ölçeği | **Tamamen Katılıyorum** | **Katılıyorum** | **Kararsızım** | **Katılmıyorum** | **Tamamen** |
|---|---|---|---|---|---|
| 1. Daha pahalı olsa da organik yiyecekleri almayı tercih ederim. | | | | | |
| 2. Sulak alanların, çeşitli sektörlerde (ör: tarım, turizm vb.) o alanda yaşayan halka geçim kaynağı sağlaması amacıyla kurutulmasını desteklemem. | | | | | |
| 3. Ekonomik sıkıntılar nedeniyle doğal kaynakların (ör: kardelen) aşırı kullanımına karşı tepki gösteririm. | | | | | |
| 4. Doğal kaynakları doğru bir şekilde kullansak bile biyolojik çeşitliliği korumak mümkün değildir. | | | | | |
| 5. Tüketilen ürünler daha pahalı olsa bile biyolojik çeşitliliğe zarar vermeyen ürünleri kullanmayı tercih ederim. | | | | | |
| 6. Çok sık rastlanmayan bitkilerden elde edilen ürünleri kullanmam. | | | | | |
| 7. Milli park ve ormanlık alanlarda turizmin gelişmesi amacıyla bina yapımı için devletin izin vermesi beni rahatsız etmez. | | | | | |
| 8. Türkiye biyolojik çeşitlilik açısından zengin olduğundan dolayı doğal kaynakların tükenmesi konusunda rahatsız olmam. | | | | | |
| 9. Tüketim alışkanlıklarımız, toprağın kalitesine ve tarım topraklarının kaybına neden olacağından dolayı bitkilerin yetişmesine engel olacaktır. | | | | | |
| 10. İlaçların özenle seçimiyle tehlike altındaki tıbbi bitkilerin korunmasına katkıda bulunulur. | | | | | |
| 11. Kozmetik ürünleri dikkatli seçerek tehlike altında bulunan türlerin korunmasına katkıda bulunurum. | | | | | |
| 12. Türlerin korunması için çeşitli projelerin yürütüldüğü bir çevre grubuna katılırım. | | | | | |
| 13. Bahçemin bir kısmını kendi haline bırakarak biyolojik çeşitliliğin korunmasına doğrudan katkıda bulunurum. | | | | | |
| 14. Türkiye"de nesli tehlike altında olan türlerin yeterli bir şekilde korunması için kulüp çalışmalarına katılırım. | | | | | |
| 15. Biyolojik çeşitliliği korumak için toplumsal olarak sorumluluk projelerinde görev alırım. | | | | | |
| 16. İnsanları biyolojik çeşitliliğe zarar veren davranışlarından dolayı uyarmam. | | | | | |
| 17. Biyolojik çeşitlilik, günlük faaliyetleri doğaya uyumlu olarak yaşamakla ve en yakın çevreden başlamakla korunmaz. | | | | | |
| 18. Doğal kaynakları, gereksiz kullanmayarak biyolojik çeşitlilikle ilgili sorunlar çözülebilir. | | | | | |
| 19. İnsan faaliyetleri, dünyanın iklimini değiştirerek biyolojik çeşitliliğe zarar vermektedir. | | | | | |
| 20. Fauna, flora ve habitatlar, yaşanabilirlik açısından elverişli hale getirilmelidir. | | | | | |
| 21. Vahşi hayvan türlerinin ticari amaçlı kullanımı konusunda sıkı kontroller yapılmalıdır. | | | | | |
| 22. Tarımsal ürünlerin yalnızca insanlara faydalı olan çeşidi değil, tüm ürün çeşitleri korunmalıdır. | | | | | |
| 23. Orman özelliğini kaybetmiş arazilerin, ülkeye gelir getirmesi amacıyla satılması beni rahatsız etmez. | | | | | |
| 24. İnsanların yararlanmadığı doğal alanların korunması için harcanan para gereksizdir. | | | | | |
| 25. Biyolojik çeşitliliğe zarar veren davranışlardan kaçınırım. | | | | | |