

# Education Quarterly Reviews

**Kucuk, Mehmet, and Ekinci, Semra Burkaz. (2021), What Do Turkish Experts Say about Sustainable Development Goals and Teaching about Achieving these Goals? In: *Education Quarterly Reviews*, Vol.4, No.3, 290-303.**

ISSN 2621-5799

DOI: 10.31014/aior.1993.04.03.339

The online version of this article can be found at:  
<https://www.asianinstituteofresearch.org/>

Published by:  
The Asian Institute of Research

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# What Do Turkish Experts Say about Sustainable Development Goals and Teaching about Achieving these Goals?\*

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## Abstract

The research aimed to investigate what Turkish experts say sustainable development goals and teaching about achieving these goals. The research has a qualitative design, and the analysis of the interviews consisting of ten questions was made by document and content analysis. Interviews were held with ten academicians, who are experts in their field and have included the topic of sustainable development in their studies. Interview questions consisted of two parts in terms of content, in the upper part only for scientific purposes and for information purposes in consideration of ethical rules, as well as demographic information and the main questions. The main questions are based on determining whether the curriculum is sufficient in terms of the education of sustainable development, as well as identifying students who have gained awareness about this issue and the behaviors that can be expected from students. The interviews lasted an average of twenty-five minutes. The data were analyzed by transcribing the sound recordings. After the analyzes were completed, the codes, categories, and themes related to the questions were determined. As a result, with this study, a needs analysis, which is the first stage of the sustainable development teaching material to be developed within the scope of a large project study, has been made. In line with the results, new acquisitions about sustainable development were developed.

**Keywords:** Education of Sustainable Development, Science Education, Needs Analysis

## 1.Introduction

Climate changes, environmental pollution, and epidemic diseases are the main problems that people have been trying to solve from the past to the present. Besides these; the use of fundamental rights, such as the increase in hunger and poverty, efficient use of our resources, and access to healthy water, has become a globally accepted problem these days. Since these global problems cannot be solved by only some countries, there have been many global initiatives for a long time. When looking at these initiatives historically, considering the studies done until today; the United Nations Stockholm Conference held in 1972 with the participation of 113 countries, the Mediterranean Action Plan in 1975, the Tbilisi Conference in 1977, the establishment of the World Environment

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\* This research was produced from the doctoral thesis conducted by the second author under the supervision of the first author.

and Development Commission [WCED] in 1983, the United Nations Conference on Environment and Development [UNCED], in Rio de Janeiro in 1992 signed in Kyoto, Japan, as a result of the failure of the Framework Convention on Climate Change, which was prepared for the reduction of greenhouse gas emissions of countries at the UNCED held in Rio de Janeiro in 1997, the "Kyoto Protocol, which was gathered in New York under the presidency of the United Nations in 2000. The publication of the "Millennium Declaration" by the leaders, the holding of the World Sustainable Development Summit (Rio + 10) by the United Nations in Johannesburg, South Africa in 2002, and the recent meeting of world leaders in New York under the presidency of the United Nations in 2015. The way they accept the 2030 Agenda sorting can also be done (Aytar, 2016; Aksu, 2011; Oz Mehmet, 2008).

Turkey took part in these studies and put the concept of "sustainable development" on its agenda as a priority. In this context, within the scope of the "2030 Agenda" to make the whole world a more sustainable place; a total of 17 Sustainable Development Goals (SDGs) have been defined and declared by an official website subordinate to the Presidency of the Republic of Turkey (see <http://www.surdurulebilirkalkinma.gov.tr/>). The slogan of the SDGs was determined as "leaving nobody behind" between 2015 and 2030. Among these purposes, it is possible to mention some new goals that were not previously on the agenda. In this context; in addition to social and environmental issues such as gender equality, observing the needs of disadvantaged groups, reducing food waste, combating desertification and drought, protecting biodiversity, economic growth, technological development, employment, and industrialization have also been included in the scope of sustainable development.

Undoubtedly, the most effective way to adopt a lifestyle that is suitable for these goals, both cognitively and affectively, is to include these goals in all kinds of formal or informal education and training activities (Alkis, 2007; Kaya & Tomal, 2011). Supporting this situation, these targets are included in many programs in other countries (Petersen & Alkis, 2009; Walshe, 2008). Related to this, the concept of sustainable development in Turkey finds its response in the Science Education Program as "recognizing the mutual interaction between the individual, the environment and the society and developing the awareness of sustainable development regarding society, economy and natural resources" (Ministry of National Education [MNE], 2013). Considering the curricula, it is revealed that the subject of "Sustainable Development" is included only in the science lesson curriculum and at the 8th-grade level. However, placing this subject with limited gains to gain skills that individuals can reflect what they have learned in school life into their daily lives does not constitute a source for meeting the importance of the subject fully nor reaching the expected outputs (Yapici, 2003; Tanrıverdi, 2009).

In this context, it will be easier to reach the targets set by 2030 by enriching the achievements regarding sustainable development in the curriculum. It is obtained that the studies on sustainable development generally try to measure the conceptual understanding of sustainability, sustainable development, and education for sustainable development. Similarly, it was observed that studies were conducted on geography, science, and social studies teacher candidates studying at universities to determine the situation. It has been observed in studies that data collection tools are generally questionnaires and interviews. When the studies conducted on both teacher candidates and secondary school students were examined, it was found that there were deficiencies in the conceptual understanding of the sub-dimensions of the concept of sustainability and sustainable development (Aytar, 2016; Ozturk Demirbas, 2011; Tanrıverdi, 2009).

The research results, which have been examined and discussed so far, reveal the need to work with studies that can reveal the environmental, social, and economic aspects of sustainable development as a whole. Similarly, there is a need for the development of appropriate teaching materials for the successful realization of education for sustainable development, which has just started to be studied, and to offer it to the relevant stakeholders (Aytar, 2016). The first thing to do in this process is to employ a qualified needs analysis study by operating the material design process related to the teaching material in question. In a material design process, when the needs analysis is not handled well, there may occur important problems (Kaya, Cepni & Kucuk, 2004; Cepni, Kaya & Kucuk, 2005). When the steps of preparing a curriculum are examined, the first step appears as determining the needs. Needs analysis, defined as a systematic information gathering and analysis process, generally consists of preparation, analysis, reporting, and use of information (Demirel, 2012; Adiguzel, 2017). Then, the acquisitions

that can meet the determined needs, the learning-teaching process according to the content goals and content, and the evaluation of the program depending on all of these should be done.

In the needs analysis, the technique of literature review and interviews with experts is frequently used (Kaya, Cepni, & Kucuk, 2004). While conducting the needs analysis within the scope of the current research, following a detailed literature review in the subject area, it was revealed that new acquisitions were needed to eliminate the gap in the curriculum. Based on the view that expert opinion may be important in filling this gap with new gains, experts who write book chapters and thesis in the field of sustainable development could take place, and a group of teachers who carried out thesis consultancy was interviewed. As the outcomes dimension of the curriculum planned to be designed would be shaped by the interviews, it is thought that it will make a significant contribution to the research. Undoubtedly; since determining the gains that constitute the most important dimension of a teaching program will shed light on other dimensions, this part must be purposeful and useful.

On the other hand, when we consider the global sustainable development goals; the realization of 17 goals can be regarded as an indicator of development. As in every field, if it is desired to raise a conscious generation at the point of sustainable development goals, the most important way to achieve this is to provide quality education. In this context, the title of "Quality Education," which takes 4th place among the global goals, constitutes the main theme of the current study. In terms of cognitive development; students in primary 6th, 7th, 8th grades and secondary education in the 21st century, it is necessary to include activities that improve the characteristics of their skills such as analyzing, comparing, establishing abstract relationships, producing something original, and critical thinking (Senemoglu, 2010). Now, at this point, it is very important to raise individuals who are involved in the curriculum and are sensitive to their environment. For students to participate actively in preventing and solving environmental problems in their country in terms of sustainability; the cognitive, affective, and psychomotor areas as a whole should be given the necessary weight and importance in the programs (Derman, 2013). The basis of sustainable development is to define the behavioral patterns and motivations of individuals and to ensure that individuals develop positive attitudes with appropriate behavioral patterns (Uzun, 2007). In this context, the curriculum should be flexible and have educational situations that will provide students with mental and manual skills rather than providing knowledge. The teaching programs must be prepared and implemented in this context.

In the current research, the answer to the question of 'What Turkish experts say about sustainable development goals and teaching about achieving these goals?' was sought in detail. For this reason, the research appears as an original study in that it includes a needs analysis for teaching material to be designed for sustainable development goals.

## 2. Method

In this research, the phenomenology method was used based on a qualitative research approach (Creswell, 2013). In this way, the characteristics of individuals who received an education based on sustainable development were revealed based on the opinions of experts in the field. The new knowledge generated in this research, which is part of a large project, was used to determine the achievements of the sustainable development teaching material.

### *The study group*

While determining the study group of the research; the purposeful sampling method was used. This sampling method, which is highly preferred in qualitative research, the research will gain momentum as individuals who are suitable for the research are identified (Buyukozturk et al., 2013; Levent et al., 2017). In this way, while determining the experts to participate in the research, academicians studying in the field of sustainable development were preferred. The study group consisted of 10 academicians (2 female, 8 male) studying in different state universities of Turkey. Since the academicians in the study group are experts in the context of the subject area, code names such as U1, U2, U3, ..... U10 was used while making their definitions and included in the findings. Information on the studying areas of the experts participating in the study is given in table 1 below.

Table 1: Studying areas of experts

	Studying places	Experts
Type of Studies	Including thesis and thesis advisory in her studies	U1, U2, U6, U7
	Chapter of a book, article, proceeding	U3, U4, U5, U8, U9, U10
	Actual studies	U3, U7, U9

Experts are studying in the field of science (80%) and liberal arts (20%). The experience periods of the experts in the study group are determined at certain intervals and presented in Figure 1 according to the gender distribution.

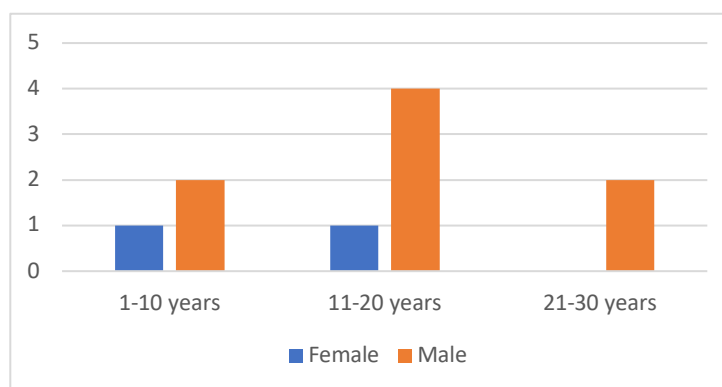


Figure 1: Distribution of academicians by professional experience and gender

#### *Data collection tool*

In this study, semi-structured interviews were used as data collection tools. Semi-structured interviews aim to obtain in-depth information on a specified subject with enough detail. If the answer received in the interviews is incomplete or not clear enough, the interviewer can provide more explanatory information with the help of other questions (Cepni, 2007). The interview used in this study, was aimed to get answers to the questions: "What kind of individuals do we aim to raise in the field of sustainable development, and is current Turkish curriculum sufficient to raise individuals with these characteristics?" The interview, which consisted of 10 questions and two parts in the upper part that includes only a scientific and informative article considering the ethical rules, as well as demographic information and the main questions.

Questions are based on determining whether the curriculum is sufficient in terms of sustainable development education as well as identifying students who have gained awareness on this subject and the behaviors that can be expected from students. To ensure the validity and reliability of the interview questions, the opinions of three experts in the field of science education were used. Also; interview questions were read by two Turkish teachers and one science teacher, so their comprehensibility was determined. After receiving positive answers from both teachers, the experts to be interviewed were contacted.

Based on the expert opinion, the question "What do you know about Turkey's sustainable development goals?" has been changed to "What can you say about the sustainable development goals of Turkey?" to be more understandable. The interviews were carried out by asking for permission from the expert lecturers and by taking audio recordings. After the interviews, the answers were transformed into written form, and analyzes were performed in this format. In addition, after the interviews with the experts were completed, the validity and reliability of the study were ensured by sending the written forms of the voice recordings to them and obtaining their approval. The interviews lasted an average of 25 minutes. The interviews took approximately 3 months to complete.

### Data analysis

Experts participating in the interviews within the scope of the research were coded with the codes U1, U2, U3 ..... , U10 as explained before. The data obtained from the interview were analyzed using the descriptive content analysis method, which is a type of content analysis. Descriptive content analysis is an approach used when defining the results obtained from both qualitative and quantitative studies (Calik & Sozbilir, 2014). In this way, it is thought that the teaching material planned to be developed in the large project in question will contribute to the creation of the outcomes dimension and will guide researchers who want to learn about it. While analyzing the descriptive content, categories were created based on the roots of the questions asked in semi-structured interviews. These categories were formed entirely by the researchers and in line with semi-structured interview questions. It was tried to be supported with direct quotations containing the expressions of the experts by presenting the categories in the form of tables that emerged from the opinions of the experts.

### 3. Results

In this section, the findings obtained from the answers to the interview questions asked to the experts are included. First of all, tables containing the questions asked, and then the answers are presented.

*Question 1: What can you say about Turkey's sustainable development goals?*

Table 2: Experts' opinions on the sustainable development goal

Views on the Sustainable Development Goal	Features	Experts
	Being aware of the whole, the SDG relates the work done with the goals.	U1, U3, U6, U9
	Being aware of the SDG, but not linking the work with these goals	U4, U8, U10
	Seeing SDG as a different field and not associating it in their studies	U2, U5, U7

(SDG: Sustainable Development Goals)

When the interview data were analyzed, it was first tried to measure whether the experts interviewed associate their knowledge of sustainable development with sustainable development goals. It was revealed that the three experts interviewed (U2, U5, U7) consider the information in this field independent of the sustainable development goals. On the other hand, it is reflected in the table that four out of ten experts explain the sustainable development goals in the context of their studies and explain a few of them about the sub-goals of the goals.

*Question 2: What work have you done so far related to sustainable development?*

Table 3: Type of experts' work

Type of Studies	Studying areas	Experts
	Including thesis and thesis advisory in her studies	U1, U2, U6, U7
	Chapter of a book, article, paper	U3, U4, U5, U8, U9, U10
	Actual studies	U3, U7, U9

It was revealed that the majority of experts participating in the interviews wrote book chapters, articles, and papers. It is understood from the answers they gave to the 1st and 2nd questions that the teachers who wrote a thesis on the subject gave more detailed information about the subject. For example; U2: said

“I worked on ‘how can sustainable development education be feasible?’ I worked on the conceptual and developmental dimensions, but I did not only study inside the school but also watched the students outside. In this way, I have conducted both conceptual and applied studies.”

U5 also said:

“I only wrote a chapter of a book, but I did not know the subject in such detail. As far as I follow, new developments are also taking place, and this issue should be constantly investigated. Sometimes I can lag behind them”. The expert stated that s/he could not follow the new developments on the subject.

U3 also said

"I trained thousands of environmentally friendly students. We have planted thousands of trees that I have participated in, including myself. I have/have done awareness-raising activities in primary and secondary schools. I use energy and water sparingly, my garbage production is low, I do not drive if it is not necessary, I have published environmentally conscious educational materials such as "green boxes" and dozens of articles. I adopt the principle of "Our underground and aboveground natural resources are not inherited to us from our ancestors, we borrowed them from our grandchildren" and I raise students with this principle."

It can be said that U3 defines raising students and raising awareness of future generations as a de facto work while explaining his studies. It is understood from these expressions that participating in the projects and leading the tree planting works and acting in line with a certain slogan and arranging according to their life are considered as actual work.

*Question 3: What can you say about the place and importance of sustainable development in the curriculum?*

The answers to this question were analyzed in two separate tables.

Table 4.1: Expert opinions on the importance of the sustainable development issue in the curriculum

The sustainable development issue in the curriculum	Experts
Aware of the gap in the SC area and explains what needs to be done	U1, U3, U4, U6, U9
Aware that there is a gap in the SC area, but cannot explain what needs to be done	U2, U10
Not aware that there is a gap in the SC area	U5, U7, U8

Table 4.2: Experts' recommendations for overcoming the deficiencies regarding sustainable development.

Suggestions for overcoming the deficiencies regarding sustainable development	Experts
Parent's role model	U1, U9
Writing a book. Preparation of sample materials, focusing on projects and training	U3, U4
Training in out-of-school settings	U4
Its place in our education programs should be increased	U6, U9

As can be seen in Table 4.2 the recommendations of experts who think that there is a gap in sustainable development are presented in different categories. The recommendations reveal that the importance within the school should be increased and the processes outside the school should be given importance. While there are suggestions such as increasing the achievements of our curriculum on this subject and enriching the materials (U3, U4, U6, U9) inside the school, it is seen more important to internalize the subject with cooperation of parents outside the school (U1, U9). Sample sentences highlighting the deficiencies in our curriculum from the answers given to the question are given below:

“... this concept, which has different dimensions, should be more integrated into curricula so that our children will be familiar with this concept even at a young age. Otherwise, it may be more difficult to teach a student who comes to university to be conscious. ” [U6]

“I think more academic studies should be carried out on this subject. We need to have lesson contents that allow us to practice and observe our children, not just on paper. ” [U9]:

*Question 4: Is there already a gap in this area?*

Table 5: Indicators of the gap in sustainable development

Concept / S.D. the nature of	• Lack of knowledge
	• Using it in the same sense as environmental education
	• The definition is not suitable for all levels
	• Being abstract
Size	• Environmental Dimension to come to the fore
	• The economics dimension is far from students
	• Lack of achievements with the same importance in three dimensions
Press	• Limited written sources (Magazine, Advertisement Brochure)
	• Lack of coverage in social media, lack of popular articles
	• News reflecting the bad and being insufficient to raise awareness
Program	• Not Rich in Content
	• Lack of awareness studies in high school and primary education
	• Not including the pre-school period
Academic	• Turkey lags 30 years behind in terms of familiarity with the issue compared to abroad
	• Being an interdisciplinary concept
	• Not teaching as a separate course
	• Lack of consciousness as well as attitude knowledge and awareness
	• Experts do not come together with joint studies.

Looking at table 5, it is seen that there are experts' opinions that accept that there is a gap in the field of sustainable development and attribute this to the reasons presented in the table. These reasons can be explained as follows; Perceiving the concept of sustainable development as difficult and as a subject related to different fields (economy). The fact that the environmental dimension of this concept, which consists of three dimensions, comes to the forefront, causes the other dimensions not to be given the same importance and it creates a view that creates a gap in this area. Looking at the press category; while the subject of hunger was given in the news and social media, it was not associated with the sustainable development issue and insufficient written sources were presented as the reason. The reason for the gap in the size of the program is seen to be due to the content not being rich and not being adapted to students in the younger age group. In the academic category, the opinions of experts are mostly justified for not conducting scientific studies, not addressing the subject as a whole, and not being addressed with a separate course dimension.

*Question 5: In your opinion, do the existing secondary school education programs raise individuals with “sustainable development awareness”?*



Table 6: Experts' views on whether the curriculum is raising individuals with sustainable development awareness or not

Curriculum Perspective	Opinions	Teachers
	The program is sufficient but additions are required	U5, U6, U7
The program is not sufficient	U1, U2, U3, U4, U8, U9, U10	

As seen in Table 6, it is seen that more than half of the experts think that sustainable development is not included enough in the curriculum.

*Question 6: Why can't individuals with Sustainable Development awareness be raised? How would you explain the reason?*

Table 7: Experts' views on the reason why individuals with Sustainable Development awareness cannot be raised

The reason why individuals with Sustainable Development awareness cannot be raised	Justifications	Teachers
	Failure to reflect the curriculum in daily life	U1, U3, U4
Insufficiency of the dimensions of the curriculum in terms of scope	U9	
External factors (family, social environment, technology abuse)	U2, U8, U10	

When asked the reasons why the current education programs on sustainable development could not raise a conscious and high level of awareness individuals, experts gave answers that can be grouped into three different categories. While one expert explained the reasons for this inadequacy due to the lack of wide scope, half of the other experts claimed that the curriculum remained in theory but could not be implemented in daily life. Finally, considering that the external environment (family, peer interaction) is important in these issues, experts have stated that the deficiencies in this area cause individuals with poor awareness to grow.

*Question 7: As a specialist in this field, what kind of changes would you suggest to make in which dimensions of the curriculum (target, content, educational status, evaluation) to reach the goals set, and especially to raise individuals who are desired effectively?*

Table 8: Experts' views on which dimensions of the curriculum should be changed

The Importance of Program Size	Size	Teachers
	All Sizes	U1, U3
Education and training status	U2, U4,	
Target and content	U8, U9, U10	

Based on the answer to the question posed to the experts in question 7, it was determined that there are some deficiencies in the dimensions of the curriculum. The 7th question was asked to learn from which of the teaching dimensions these deficiencies arise and to further elaborate. The answers have also revealed which dimensions should be changed. Most of the experts (3 out of 7 experts) argued that the target and content section should be revised again. While two experts stated that the education and training situation was incomplete, it was determined that two experts argued that all dimensions should be reviewed. Some of the sample answers are presented below;

"The achievements and contents should be arranged according to the environment in which children live, and while evaluating our students, we should have certain parameters so that we can observe the effect of the process." [U1]

"I think our curriculum should be completely renewed in this regard." [U3]

*Question 8: What can you say about the characteristics of a student who has gained awareness of sustainable development?*

Table 9: Characteristics of an individual who has gained awareness of sustainable development

	Behaviors	Teachers	Example Behaviors
Characteristics of the Awareness Individual	Environmental	U2, U4, U5, U6, U7, U9	-They prefer the products they purchase with the least harm to the environment. -They are even affected by events far from their hometown and predict that this situation can harm everyone.
	Social	U1, U3, U4, U8, U9, U10	-They pay attention to peer interaction. -They respect their culture and values.
	Economic	U2, U3, U4, U5, U6, U9	-Avoid waste (turning off the unused air conditioner, turning off the light) -They are aware of concepts such as green economy, sustainable environment, alternative energy sources.

The characteristics that an individual who has gained awareness of sustainable development should have been presented in Table 9. According to the answers received from the experts, the behaviors an individual should exhibit are classified according to each dimension of sustainable development. It is striking that there are equal numbers of behaviors related to all three dimensions and shown by equal numbers of experts.

*Question 9: How can we distinguish between individuals who have acquired this awareness and those who have not? What specific behaviors do these students show?*

Table 10: Expert opinions on the characteristics of the students who gained awareness and did not

A student who gains awareness	A student who doesn't gain awareness
They do not cut down the tree and take care to water the tree.	May show lavish behavior. They try to save their day
They do not save the day, think about tomorrow.	Tend to behave positively only in mandatory areas.
They assume that all people are equal regardless of language, religion, or race.	They are not sensitive to environmental problems.
They do not want the tea that they think they cannot finish and recycle the bottle of water they drink.	They like to collect lots of the same material.
Economically uses materials that are used individually and jointly in the classroom.	Limit what they learn to school and class
Reflects and tells the positive behaviors learned to her family.	
The mood in expressing yourself and talking about interests is positive.	
In homework, they enjoy the process, not the result.	
Take what it needs.	
Students who believe implements	

Table 10 includes behaviors that can be used to distinguish individuals who have gained awareness of sustainable development from individuals who cannot win. Since these behaviors are also the characteristics of an individual with awareness, they appear as desired student behaviors at the end of the curriculum.

*Question 10: Which subjects of social development content may raise difficulties in teaching? How can we overcome these difficulties?*

In the last question posed to the experts, the possible difficulties that may be encountered in teaching the subject of sustainable development and the solutions to these difficulties were asked. The answers are presented in items as below.

- It was stated that the content dimension of the Turkish curriculum is sufficient and it would not be appropriate to make changes regarding this section.
- It is thought that difficulties may arise because the economic dimension of SD is not close to science in terms of terms and its social dimension is abstract.
- It may be difficult to understand the religious issues within the scope of the social dimension due to the difficulty of the children's level. (The samples should be appropriate to the readiness level of the students)
- There may be difficulties in affective behavior. To prevent this, the principle of "loving nature should be taught rather than teaching nature" should be acted upon. In addition, the attention of the students should be drawn by giving examples from their environment and familiar situations.
- Observing the behavior in the classroom can be difficult. However, the process can be facilitated by receiving parent and peer support.
- Since the subject will take a long time as of time, loss of motivation may be observed. For this reason, the teacher must be patient to ensure their intrinsic motivation.

#### **4. Discussion**

In line with the data obtained from the studies conducted in the field of sustainable development and the interviews with academicians who are regarded as subject experts, the findings regarding whether the current curriculum is sufficient for sustainable development are discussed in this section. The fact that sustainable development is not included in a holistic approach in the current Turkish Science Curriculum has been seen as the most fundamental problem. To eliminate this problem, it is aimed to identify the deficient and need to be corrected aspects, to present a sample material, and most importantly to share the information obtained about the characteristics expected from an individual who has received sustainable development education.

Through interviews, 10 academicians studying in 10 different universities in Turkey were interviewed on sustainable development. The inclusion of the academicians on the condition that they have worked on this subject before and their answers to the semi-structured interview form make our research unique due to the diversity of their experiences and perspectives on the subject. Another important aspect of the study is that it made important contributions to the studies to be carried out in Turkey as a result of the findings obtained in terms of guiding and teaching material. As a result of the literature review, to determine the position of sustainable development in the Turkish curriculum, it was noticed that there are studies in the field of social studies (Kaya & Tomal, 2011; Dinc & Acun, 2017; Aydoğan, 2010) in addition to the science lesson (Temocin, 2007; Aytar, 2016; Seker, 2017).

In addition, it has been observed that there are studies that examine the teaching programs of both courses in the context of sustainable development (Tanriverdi, 2009; Colak, 2012). Considering the 2018 science curriculum, sustainable development has taken its place in 8th-grade subjects. However, until reaching this class level, the issue of sustainable development is not directly addressed, but the gains related to the subject are generally given in connection with environmental issues. The study of Tanriverdi (2009) showed that similar results have emerged. When it comes to the final grade of middle school, it is limited in terms of understanding the importance of the subject that students suddenly encounter this concept. This limitation causes sustainable development to be

perceived as an issue equivalent to the environment. However, sustainable development is a concept from three dimensions (social, environmental, economy). To emphasize that all three dimensions have the same importance, it is important to organize the curricula in this direction and to enrich their content in this way.

Based on the point of "what can be done" to make up for the deficiency in the current curriculum, an answer has been sought for what needs to be done to raise individuals who adopt the issue of sustainable development. In this context, considering Table 2, it is seen that there are experts who think that there are some deficiencies in the curriculum on sustainable development and offer suggestions on the subject. In addition, some academicians think that there is no deficiency (U2, U5, U7). Results supporting this view are also seen in Table 4.1 Since U5, U7 and U8 were not aware of the sustainable development goals, they could not express their opinion for the solution of the issue.

Considering Table 4.2, it is seen that different suggestions are presented to understand the importance of sustainable development and to eliminate its deficiencies. Some academics argue that parents should be an example, as well as those who argued that education should be enriched in the context of the school and emphasis should be placed on out-of-school learning environments. Ozdemir (2010) also concluded in his study that there is a positive and significant change in students' perception and behavior towards the environment of environmental education that is processed in nature.

One of the experts, U9, made statements emphasizing the importance of both parents and the curriculum. Studies have shown that sustainable development should spread to the process rather than the behaviors to be gained at once. It is important that the scope of the subject is wide and our country has targets until 2030, while the content is presented with richer elements and that students make them a skill in their daily lives. Gaining these behaviors is limited to 5 acquisitions in the 2018 science curriculum. It does not seem possible to teach a sustainable development program with 17 target areas and sub-goals for each target with such few achievements. Since the acquisitions that reflect all the goals will be challenging both in terms of time and the level of the children, these requirements can be met with a new material that includes sufficient gains for students at the secondary school level, even if not all goals. Looking at other countries, we can see that environmental issues are included as a separate course in their curricula (Finland, Austria, and England).

It is expected that the inclusion of the sustainable development issue, which has an intense and detailed content, in the education program of our country with such an application is expected to have better results (Alim, 2006). As a separate course, other dimensions (economic and social) will also come to the fore and sufficient time will be allocated. For example; while explaining the economic dimension of sustainable development to children, it can be emphasized that the issue has responsibilities for their age group by giving examples from their daily life, and in this way children can be at the center of the process.

As a result of the interviews, it has been revealed that some problems prevent these innovations. If these problems are to be listed; the nature of sustainable development is not fully known and it is an abstract concept. Because secondary school students often have prejudices by seeing the subject name hard or thinking it is an upper-class subject. However, it is thought that explaining all three dimensions more holistically while giving concepts in curriculums will break this judgment. Because the concept of environment in the concept of sustainable development includes the social and cultural environment of individuals as well as their natural and immediate environment. It has been revealed that the social and cultural environment is almost not included in general and specific goals, and the environment is more perceived as a natural environment (Tanriverdi, 2009).

Another problem is that the issue is not given enough attention in the press. For example, when reporting on hunger and poverty in the news, instead of attracting people's attention with only pictures and videos, the message should be given about what can be done to prevent this and that everyone has an important place at this point. Based on this, it will be an important step to bring the information in the press to the agenda in a language that will raise awareness of children and they will assume responsibility. Another of our problems was the features we evaluated in the academic category. For example, the inadequacy of the studies conducted in Turkey and the fact that the

sharing in congresses or publications cannot be reached to the masses cause the importance of the subject not to be understood by everyone. Instead; striking results or suggestions obtained from an academic study should encourage practical studies and go beyond being a written article on paper. In their study, Artun and Ozsevgec (2014) put the student at the center of the teaching process by activating the student with a modular curriculum on the subject of environment. In this way, they concluded that the students learned environmental issues better, could produce solutions for the environmental problems they encountered, and their success increased due to these reasons.

Since the 5th, 6th, and 7th questions directed to the experts are related to each other, it would be more appropriate to interpret the findings in common. When the experts were asked whether the current curriculum is sufficient for sustainable development, it was concluded that seven of them (U1, U2, U3, U4, U8, U9, U10) did not consider the program sufficient. As a justification, it is presented that what has been learned at school is not reflected in daily life, the dimensions of the curriculum are insufficient and the social environment is not strong enough to reinforce what has been learned. Family is one of the main elements that make up the child's social environment. Assuming that the first education starts in the family, children start by imitating what they observe and gain responsibility as they become aware of what they do (Erkal, Safak, & Yertutan, 2011).

Among the dimensions of the curriculum, it was suggested that these sections should be revised, considering that the target and content sections were insufficient. The target dimension is an important part that directs other departments as the first step in a curriculum. Based on this importance, another question was asked which student characteristics should a program be designed to raise individuals who have gained awareness of sustainable development. The findings are presented in Table 9 and gains that reflect these behaviors have been created and have taken place in the aforementioned thesis study. Finally, at the end of our curriculum, they were asked to list the features that can distinguish between students who are aware and students who are not. With the data obtained here, the content and educational status part of the curriculum was also shaped.

## 5. Conclusion

It should not be forgotten that raising individuals who can prevent environmental problems will offer us a more livable world and a more livable future (Uyanik, 2017). Based on the fact that the sustainable development issue was not given the necessary importance in the Turkish curriculum, researchers tried to get the opinions of the experts on how to solve this problem. In this context, it has emerged that it would be appropriate to teach the subject of sustainable development under a separate module instead of teaching it as a subject or unit in a specific curriculum. Similarly, it was shared that it is valuable to process student-centered activities for each goal in informal teaching environments as well as formal teaching. It is important that this teaching covers not only environmental issues and awareness but also all 5 dimensions of sustainable development, as in the studies shared in the literature. Most importantly, the need for structuring an education in which affective learning will be at the forefront rather than cognitive gains for sustainable development has been emphasized.

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