



**Journal of Education in Science,
Environment and Health**

www.jeseh.net

**Primary School Teacher Candidates'
Perceptions and Experiences of Real-
World Sustainability Problems in
Education for Sustainable Development**

Nur Utkur-Gulluhan
Istanbul University-Cerrahpaşa

ISSN: 2149-214X

To cite this article:

Utkur-Gulluhan, N. (2026). Primary school teacher candidates' perceptions and experiences of real-world sustainability problems in education for sustainable development. *Journal of Education in Science, Environment and Health (JESHEH)*, 12(2), 120-136. <https://doi.org/10.55549/jeseh.871>

This article may be used for research, teaching, and private study purposes.

Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

Authors alone are responsible for the contents of their articles. The journal owns the copyright of the articles.

The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of the research material.

Primary School Teacher Candidates' Perceptions and Experiences of Real-World Sustainability Problems in Education for Sustainable Development

Nur Utkur-Gulluhan

Article Info

Article History

Published:
01 April 2026

Received:
10 September 2025

Accepted:
22 February 2026

Keywords

SDGs
Sustainability
Real world problems

Abstract

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In modern usage it generally refers to a state in which the environment, economy, and society will continue to exist over a long period of time. This study explored the perceptions and experiences of primary school candidate teachers trained in Sustainable Development Goals (SDGs) regarding real-world issues. Using a phenomenological approach with focus groups and semi-structured interviews, this study aims to understand the impact of SDG-related education on these candidates. Data analysis involved thematic and content analysis, revealing that teacher candidates saw a direct link between SDGs and global issues, often sharing insights based on personal experiences. They highlighted the importance of integrating the SDGs into the curriculum, suggesting both compulsory courses and projects. The candidates also prioritized specific SDGs when designing activities that were personally significant. This small-scale study aims to inform future research on SDGs and real-world problem-solving in education.

Introduction

There are many problems related to the environment around the world. Every day, we all contribute to consumption, and unfortunately, production-oriented activities are not sufficient to balance this consumption. For this reason, various studies have been conducted on international platforms. The concept of sustainability has a broad content. Sustainability, in accordance with its current meaning and purpose, was first mentioned in the "World Nature Charter" document approved by the World Conservation Union in 1982 (Ruiz-Mallén & Heras, 2020). Sustainability is a type of development that concerns all citizens living worldwide. Here, citizens' respect for ecological life and behavioral changes come into play before politicians take official actions. United Nations Educational, Scientific and Cultural Organization (UNESCO), (1997) has encouraged present generations to take action for the permanent development and preservation of life, including preserving the quality and integrity of the environment and ensuring that future generations are not exposed to the environmental degradation that would endanger their health or existence. With the aim of addressing environmental, economic, and social problems, sustainability is a good example of the interconnectedness of systems, and shows that truly sustainable solutions can only be found by transcending the current limits set by traditional rules (Uiterkamp & Vlek, 2007).

The expansion of the scope of sustainability over time has also led to concrete steps being taken towards the idea of "sustainable development." In this context, combating climate change has become one of the key dimensions of sustainable development, since climate-related risks directly threaten ecosystems, social well-being, and economic stability. At the Paris Climate Summit in 2015, countries supporting the United Nations Framework Convention on Climate Change reached a consensus. The "Global Climate Agreement" was signed. United Nations Framework Convention on Climate Change [UNFCCC], 2015).

In the Sustainable Development Program, which is a continuation of the Millennium Development Goals and was organized in 2015, 193 countries that are members of the United Nations adopted 17 sustainable development goals to eliminate poverty in all its dimensions and promote the well-being of all humanity by 2030, as shown in Figure 1. As seen in Figure 1, priority will be given to efforts to end hunger across the world with the goals of "end poverty and hunger"; raising awareness, and protecting every individual outcomes disease used by harmful chemicals and air, water, and soil pollution until 2030 with the aim of "healthy and quality life"; with the goal of "quality education," the knowledge needed by all students to advance sustainable development through education for sustainable development and sustainable lifestyles, human rights, gender equality, promoting a culture of peace and non-violence, world citizenship and recognition of the contribution of cultural diversity and culture to sustainable development, and the outcomes of skills, creating and developing

educational opportunities sensitive to children, the disabled, and gender equality, and creating safe, non-violent, inclusive, and effective learning environments for all; defending women and girls everywhere from discrimination, aiming to eliminate gender inequality; to reduce inequalities, it is adopted as a principle that respects differences, eliminates languages, religions, races, genders, and ethnicities, and builds a livable world (UNDP, 2016). Overall, Sustainable Development Goals (SDGs) have emerged as universal goals that aim to support inclusive societies, combat inequalities, and recognize the importance of cooperation (Garcia et al. 2017).



Figure 1. United Nations 2030 sustainable development goals (United Nations Development Programme [UNDP], 2015).

Background

The theoretical framework of this study is constructivism. Constructivism is a theory of the nature of knowledge and is based on students' knowledge construction (Bodner, 1986; Brooks & Brooks, 1999; Fosnot, 2007; Hendry, 1996; Hendry, Frommer, & Walker, 1999; Hove & Berv, 2000; Philips & Soltis, 2005; Schunk, 2011; Zimmermann, Peschl, & Nossek-Römmner, 2010). One of the most important factors in the development of constructivism is the research and studies of Piaget, John Dewey and Vygotsky on human development (Schunk, 2011). Constructivism focuses on "cognitive development and deep understanding" rather than on behaviors and skills in teaching. It is based on the process of students being active in constructing knowledge in their minds. Piaget explains this process as cognitive equilibrium, which occurs when individuals develop, seek new knowledge, and encounter unfamiliar situations that challenge their existing understanding. In such cases, individuals strive to restructure their cognitive schemas in order to maintain the continuity of previously formed behaviors (Brooks & Brooks, 1999; Fosnot, 2007). Since constructivism is grounded in the assumption that subjective meanings are formed through individuals' experiences, it is compatible with the scope of this study. In this respect, university students' understanding of a more sustainable system, reconstructing this understanding by generating personal meanings, and integrating it into their daily lives can be explained through a constructivist perspective.

In line with this theoretical background, Education for Sustainable Development (ESD) education has increasingly emphasized the role of learning environments that enable students to actively engage with real-life problems and construct meaning through experience. A persistent focus of academics and practitioners in the field of Sustainable Development Education since the 1980s has been how education systems can prepare students to understand, participate in, and promote more sustainable forms of development. This interest gained momentum after the Brundtland Report (WCED, 1987), and the scope of sustainability expanded to include all levels of education, including higher education and undergraduate programs. When the basis of sustainable developments examined; it is seen that Elkington (1997) put forward the "three pillars" model (in Figure 2) and

suggested that economic development policies, environmental impacts and social consequences should be balanced with equal attention for sustainability (cited in McKenzie, 2004; WECD, 1987).

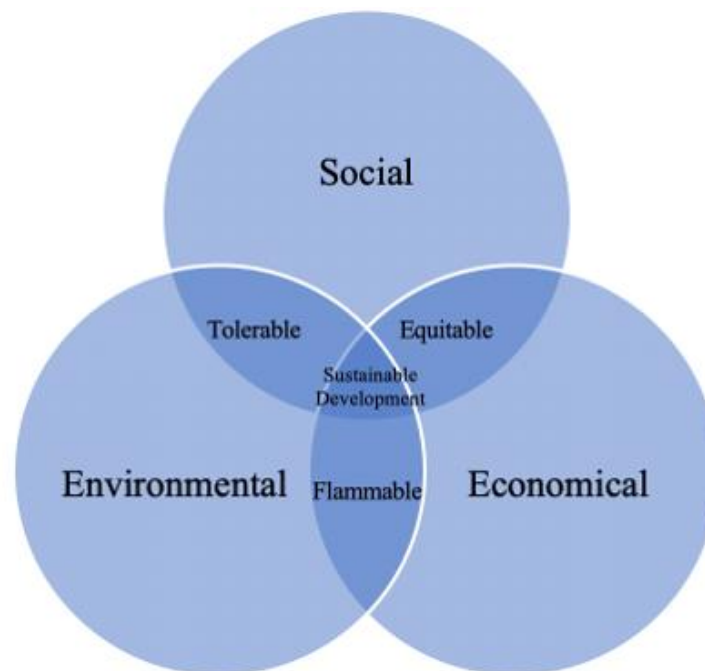


Figure 1. Three basic pillars of sustainability

While efforts have been made at various levels to promote sustainability in higher education, the integration of sustainability across traditional disciplinary boundaries remains insufficient to generate fundamental global change (McKenzie, 2004; WECD, 1987). As illustrated in Figure 2, sustainable development emerges from the balanced and integrated interaction of three interdependent pillars: social equity, environmental protection, and economic viability. However, these dimensions cannot remain merely theoretical constructs. Their realization requires concrete policy frameworks, institutional transformation, and educational initiatives that operate both top-down and bottom-up. In addition to state-led policies, awareness-based ESD initiatives targeting citizens, children, and university students—implemented individually and collectively—is essential to promote more equitable living conditions and to ensure the protection of natural resources (Franz, 2022).

The United Nations declared the years 2005-2014 as the Decade of Education for Sustainable Development. As the decade draws to more than 20 years after the Rio Summit, there is debate about how much progress has been made towards incorporating sustainability into higher education (Aktas, 2015). The important point here is the popularization of sustainability in higher education. This is because university students will be in our future. Various studies should be conducted by considering the opinions of university students on this subject using an integrative approach. University students play an active role in sustainable development because they have the potential to have an important mission as future leaders, decision makers, and shapers of society (Foguet et al., 2018).

Sustainability is a concept that includes the environmental, economic, and social dimensions. The actions that university students can take in these areas can raise awareness of education for a sustainable world. University students can contribute to creating a livable world by offering courses and workshops on sustainability. Rapid global developments have increased the interest of university students in sustainability concepts and education (Lozano et al., 2013). Studies have shown that more than 60% of university students want to learn more about sustainability, and 87% of all students agree that their university requires sustainability awareness. Global events such as Covid (19), climate change, and economic crises have shown that university students are sensitive to sustainable development (UNESCO, 2022).

Young people, who will change the fate of the future world, are also responsible for the sustainable state of the current world (Aleixo, Leal & Azeiteiro, 2021). In other studies in the literature on sustainability (Boca and Chan et al., 2017; Chuvieco et al., 2018; Dagiliūtė, Liobikienė & Minelgaitė, 2018; Karatzoglou Rieckmann, 2012; Saraçlı, 2019; Sibbel, 2009; Velazquez, Munguia & Sanchez, 2005; Wright, 2002) show that the

importance of sustainability has become more important among young people in order not to worry about the future.

As a matter of fact, some studies examining teacher candidates' perceptions and experiences regarding sustainability (Avsec & Savec, 2021; García-González, Jiménez-Fontana & Azcárate, 2021; García-Morís & Martínez-Medina, 2022) are also available in the literature. However, these studies were generally conducted with candidate teachers. This study aimed to examine the perceptions and experiences of candidate primary school teachers who received training on SDGs regarding real-world problems.

Although previous studies have examined teacher candidates' perceptions and experiences regarding sustainability (Avsec & Savec, 2021; García-González, Jiménez-Fontana & Azcárate, 2021; García-Morís & Martínez-Medina, 2022), these studies have generally focused on measuring attitudes or general sustainability awareness. In contrast, the present study investigates the perceptions and lived experiences of primary school teacher candidates who received structured training on the Sustainable Development Goals (SDGs) and engaged with real-world sustainability problems. By focusing on how teacher candidates interpret and internalize sustainability concepts after targeted instruction, this study moves beyond descriptive perception studies and explores the transformative dimension of ESD. Primary school teachers play a foundational role in shaping children's early understanding of social, environmental, and economic issues. Therefore, examining how future classroom teachers construct meaning around sustainability and climate-related challenges is critical, as these interpretations will influence their future pedagogical practices. By adopting a qualitative and experience-based perspective, this study contributes to the literature by providing deeper insight into how sustainability education can inform teacher identity formation and classroom practice.

Teachers in primary schools, where children receive their first education after their families, are very important to them. Together with these teachers, they can shed light on both the life and world in which they live. Therefore, primary school teacher candidates' experiences and perceptions regarding sustainability and climate are important, so that they can convey these to their students when they become teachers. Thus, the opinions of classroom teacher candidates who received this training will be examined, and it is thought that this will contribute to the literature and this important problem. The research problems to be addressed for this purpose are as follows.

The purpose of this study is to explore the perceptions and lived experiences of primary school teacher candidates regarding real-world sustainability problems within the framework of Education for Sustainable Development (ESD), and to examine the curriculum elements and learning activities they propose based on these experiences.

This study seeks to answer the following questions:

1. How do primary school teacher candidates who have received training on the SDGs perceive and experience real-world sustainability problems?
2. Based on these perceptions and experiences, what curriculum elements and learning activities do they propose within the framework of sustainability?

Method

Research Model

This research was conducted using phenomenology, a qualitative paradigm design. This design aims to reveal common practices and describe and explain the meanings created by the participants (Annells, 2006). To understand social reality, the focus is on the human experiences through which social reality is created (Ersoy, 2019). In this design, "the individual's experience and how he experiences it" is determined by generally reducing a universal situation to individual experiences (Moustakas, 1994; *cited in* Ersoy, 2019).

This research focuses on the perceptions and lived experiences of prospective teachers regarding real-world sustainability problems within the framework of ESD. To understand the effects of ESD-related education that teacher candidates received at some point in their lives, a phenomenological design including focus groups and semi-structured interviews was adopted. In other words, it was aimed to obtain the thoughts of the students who received education on Sustainable Development after this experience and to understand what can be done about

this issue in the future through their explanations. The research process within the scope of this study is shown in Figure 3.

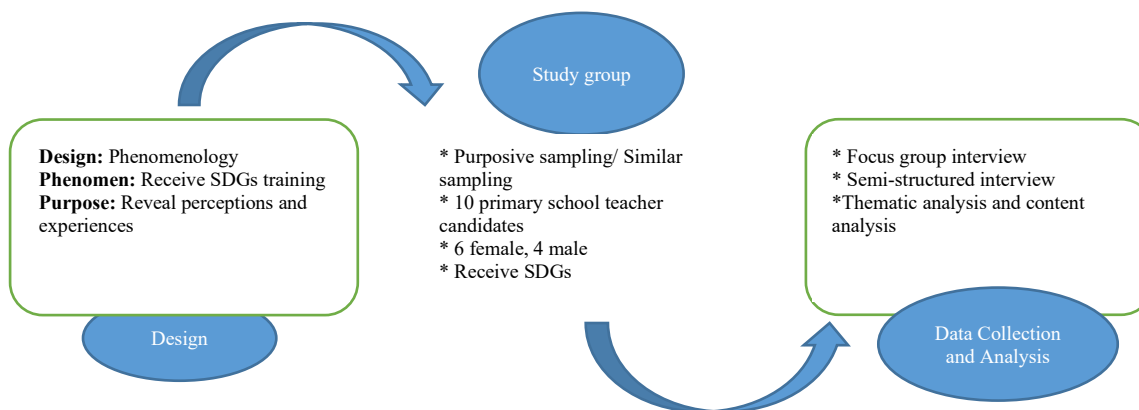


Figure 3. Research design

Study Group

To determine the participants in the study, a similar sampling method, purposive sampling, was adopted (Patton, 1987). Homogeneous purposive sampling, one of the purposive sampling strategies, was employed to determine the participants of the study (Patton, 1987). The aim of this sampling method is to identify a specific subgroup by forming a small and relatively homogeneous sample. Although the number of participants in phenomenological research may vary depending on the phenomenon under investigation, Creswell (2007) indicates that it typically ranges between 5 and 25. In line with these considerations, 10 participants were selected. The homogeneity criterion guiding participant selection was that they were enrolled in the primary school teaching program within the faculty of education and had previously received structured training related to sustainability within the framework of Education for Sustainable Development (ESD). Table 1 presents the general characteristics of the participants.

Table 1. General characteristics of the participants

		(f)
Grade level	3rd grade	5
	4th grade	5
Gender	Woman	6
	Man	4

Five of the participants were studying in the 3rd grade and five in the 4th grade in the department of primary school teaching; six of them were female and four were male. All of them had received sustainability training at some point in their lives. Permission for the study was obtained from the University of Social and Humanities Ethics Committee. In addition, prospective classroom teachers who volunteered to participate in the study were recruited and a consent form was obtained from each.

Data Collection Tools

Focus group interviews were used as data collection tools. According to Patton (1987), data can be effectively collected from groups determined by homogeneous sampling through focus group interviews. First, teacher candidates who wanted to participate in the research explained how the process would work, and ethical principles were observed by having volunteers sign a consent form. Then, a focus group interview was held with the teacher candidates, and the process was examined in detail through semi-structured interviews. The researchers applied these data-collection tools.

The focus group interview lasted 3.5 hours. It took place in 1.5 and 2 hour sessions. After the focus group interviews were transcribed, semi-structured interviews were conducted with each participant separately. Semi-structured interviews took place on a predetermined day for periods ranging from 30 to 50 min. Through semi-structured interviews, the students' opinions, which remained superficial in the focus group discussion,

deepened. In addition, after these interviews, each participant was given 30 min and asked to reflect on their activities.

Semi-structured interview questions were prepared based on the themes that emerged from the focus group discussion. In semi-structured interviews, prospective teachers were asked questions regarding both the general themes obtained from the focus group interviews and the candidate's specific situation.

The questions generally address the following:

- what candidate’s perception of sustainability is,
- what they think about SDGs,
- their perceptions of real life problems,
- perceptions and opinions about integrating the SDGs into the education faculty curriculum,
- their views on activities that can be developed to achieve SDGs and solve real-life problems.

After determining the questions, opinions were received from six experts, three of whom were experts in primary school teaching and three experts in the field of sustainability. The final version of the data collection tool was developed based on their opinions.

Data Analysis

The data obtained from the focus group and semi-structured interviews were analyzed using thematic analysis and content analysis (Patton, 1987). The data analysis technique proposed by Moustakas (1994) was taken as the basis for these analyses. In this type of analysis proposed by Moustakas (1994), both types of analysis are used in an integrated manner, intertwined in a way that supports each other.

Accordingly,

- Identifying significant statements,
- Identifying common expressions,
- Thematising meaning clusters,
- Creating structural and textural descriptions,
- Combining structural and textural descriptions were followed.

The data obtained from the focus group interviews were presented in themes by combining common expressions in order to understand the phenomenon and identify significant statements. Subsequently, as a result of the training they received regarding the SDGs, how the participants structurally formed perceptions of real-life problems and what was experienced texturally were analyzed. The presentation of the findings was also based on the semi-structured interview data, including the focus group interview data.

Validity and Reliability

The data obtained from the focus group discussions and semi-structured interviews were first transcribed and read several times. Words, sentences, and paragraphs in the data were then identified and marked for coding. Important and common expressions were identified. After the researcher coded for this process, two field-expert professors working at a state university were asked to code separately. Encoder comparisons were performed twice to ensure reliability. The two experts' codings were compared first among themselves and then with the researcher's coding, and Miles and Huberman's (1994) Validity and Reliability formula were applied. The details are presented in Table 2.

Table 2. Reliability coefficients

	Reliability value among experts	Final reliability value between researcher and experts
First problem question	0.90	0.92
Second problem question	0.92	0.94

According to this formula, to which coder reliability was applied in the analysis of the first research problem, the final reliability coefficient was 0.92. For the second research problem, this value was found to be 0.94. Therefore, according to Miles and Huberman (1984), if this value is above 0.70, the analysis of data collection tools can be considered reliable. Then, different codings were agreed upon by the experts. Finally, all coding

was divided into categories, and themes were created. While quotes from the teacher candidates' sentences were included, code names matching the initials of their names were given. Thus, their names were kept confidential. Additionally, to ensure credibility, participant confirmation was obtained after the codes, categories, and themes were determined, and teacher candidate quotes were used.

Findings

As a result of the data obtained from the focus group discussions and semi-structured interviews, the themes in Figure 4 reflect the findings.

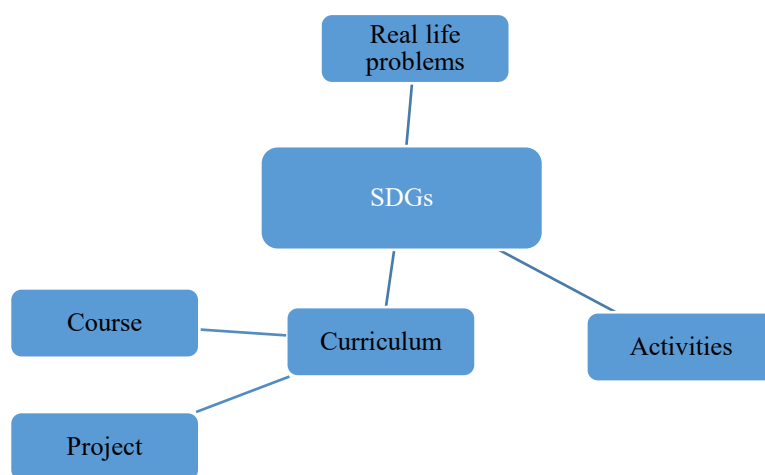


Figure 4. Themes related to SDGs

Real Life Problems Theme

As a result of the analysis, it was seen that there are real-life problems among the themes stated by teacher candidates regarding SDGs. The SDGs generally mentioned by prospective teachers and their sub-themes are listed in Table 3.

Table 3. Real-life problems faced by people related to SDGs

Main themes	Subthemes	(f)
Quality Education	Lack of differentiated education	5
	Problems in girls' education	5
	Problems in early childhood education	4
Climate Action	Climate crisis and drought	5
No Poverty	Rapid population growth	4
	Infectious diseases	3
	Inequality in economic resources	3
Zero Hunger	Mother-child deaths	4
Clean Water and Sanitation	Unconscious use of water resources	4
	Chemical waste pollutes water	3
Gender Equality	Lack of clarification of women's role	4
	Gender inequality	3
Peace, Justice and Strong Institutions	Continuation of wars	4
Sustainable cities and communities	Lack of safe playground	3
	High number of regional migrations	2

When the opinions of teacher candidates were examined in general, they expressed their opinions regarding the eight SDGs and related them to real-life problems. "Quality education" is among the SDGs that are mentioned first.

Elliott: ...Even though we are in the 21st century, the problem of girls' inability to benefit from education and training and differentiated education in line with the students' wishes and needs still persists in every country. This situation really makes people sad.

Robert: There are problems in pre-school and early childhood education. Education is the basis of everything, but we cannot provide this foundation. If we cannot provide pre-school education, we will experience a fundamental collapse. In addition, individualized and differentiated education is the most important point, for example. We see these all over the world.

Teacher candidates generally mentioned problems in the education of girls, differentiated and individual education problems, and problems in the education of pre-school age children among the problems related to education. They stated that they experienced these in their daily lives and that every country had a general problem. Regarding the "Climate Action" target, one of the candidate teachers said the following:

Elliott: It is aimed that all states strive to achieve these goals and eliminate many problems that threaten the world. However, in line with the statements made, it is stated that we are still far from achieving these goals. In particular, the world is faced with many problems such as the climate crisis, the impact of which we have felt more in recent years, and the resulting drought, regional migrations, irregular weather events and natural disasters. We already see this in the world we live in. We are getting worse every day...

With this view, Elliott addressed the global climate crisis with his own experiences and referred to problems in daily life. Another stated goal is "No Poverty". The opinions expressed regarding this include the following.

Elenor: The environment where children live should be healthy in every aspect. There must be a decent environment in many areas such as living, shelter, nutrition, marriage age, gender equality, education, health and psychology. Attention was drawn to the regions of Central and Eastern Europe and Central Asia. There are much more visible unequal and unfair living conditions in these regions, and the consequences of this situation on children are stated. Problems with rapid population growth, infectious diseases and economic resources continue wherever we live.

Hans: It is called no poverty, but there is no end state. Rapid population growth gives rise to infectious diseases and everything is getting worse day by day...

In her views, Elenor generally mentioned the problems regarding rapid population growth, infectious diseases and economic resources experienced in the world and in the country, in her views under the goal of "No Poverty" from the SDGs. On the other hand, Hans stated that he complained that he lived in a world where poverty did not end. The opinions stated by teacher candidates regarding the "Zero Hunger" goal are as follows:

Robert: Although one of the SDGs prepared by the United Nations is to end hunger, tons of food are wasted every year in the world. While there is enough food for all of us, food is wasted and some people continue to go hungry.

Bailey: I think the fact that more than half of the world is struggling with hunger shows that we cannot meet this goal. I am really sad. And because of this, mother-child deaths are increasing day by day. I also lost a relative this way.

Robert and Bailey were very emotional as they shared their views and experiences. This shows that they too have experienced similar processes and have internalized this situation quite a bit. They stated that hunger is a serious global problem. Again, Bailey regarding "Clean Water and Sanitation," "Although there are many clean energy production methods in the world, we see that energy production methods that will harm the world are used and developed. Instead of helping people who still follow outdated ways to access clean water, efforts are being made to extract water on the Moon and Mars. I think we still have a lot of shortcomings in this regard." he said. Robert, regarding "Gender quality"; "In our society, the position of women in the workplace, at home and in all other areas of life is still not clear. For example, my mother was mobbed at work the other day just because she was a woman." he said. Elliott expressed her views on "Peace, Justice and Strong Institutions" as follows: "Wars, which have covered the entire history of the world, continue today, and unfortunately, this situation makes it impossible to live in peace." Again, Robert said the following regarding "Sustainable Cities and Living Spaces": "When we look at real life, we can see that the buildings are built side by side, there are no

safe parking areas for children, and there are few large and wooded areas where people can get fresh air and spend time with their families. It is very difficult to say that this system, where people are stuck in boxy houses, creates a sustainable living space. And now I am starting to lose hope, sir."

When the views of Bailey, Elliott, and Robert regarding various SDGs were examined, it was observed that they addressed numerous real-world problems. Overall, their perceptions and experiences reflect a world characterized by negative conditions and ongoing challenges. These conditions appear to evoke feelings of concern, frustration, and, in some cases, hopelessness, particularly when participants refer to issues such as war, gender inequality, and unsustainable urban environments.

Curriculum Theme

As a result of the interviews, data on what teacher candidates would put into the curriculum to solve sustainability and real-life problems if they were the ones who prepared the curriculum applied in schools are given in Table 4.

Table 4. Themes for what could be added to the curriculum

Mean themes	Subthemes	(f)
Project	Should be compared with real life problems	10
	Must be supported with trips	9
	Must be supported with games	8
	Activities supported by drama should be carried out	8
	The concept of visual literacy should be brought to the fore	7
	Seminars and social solidarity events should be added	7
Compulsory Course	Students should be provided with active activities	6
	It should be aimed at gaining skills-attitude-value	5
	A sense of curiosity and creativity should be aroused in students	5
	SDGs should be given under book reading activities in preschool period.	4
	SDGs should be included in a coordinated manner in primary, secondary and high school lessons.	4
	It should be based on problem-based learning	3
	Should be integrated into science courses	3

As seen in Table 4, there are two main themes that should be included in the curriculum regarding the SDGs. The first of these is "Getting a project done under the name of SDGs." The other is, "SDGs should be a compulsory course at every school level." Candidate teacher opinions regarding these issues were included.

Project

When the opinions of teacher candidates are examined in general, it is seen that the opinions that want to add the SDGs to the curriculum as a project are at the forefront. It was observed that all prospective teachers stated that using projects would enable them to compare students with real-life problems. They stated that they could solve these problems by supporting themselves with various trips, games, drama activities, visual activities, seminars, and social solidarity activities. The opinions of the candidate teachers who expressed their opinions on these issues are as follows:

***Teresa:** Studies on the importance of sustainability, the cause and consequences of resource insufficiency, and what the state of our environment could be if we use resources regularly, cleanly and reproducibly can be done as a project. I would also add the benefits of practical internships related to sustainability in various organizations to the program. I would aim for students to acquire the ability to collaborate and carry out projects in groups.*

***Adam:** If we can instill these issues in teacher candidates, they can instill these goals in the younger generation when they graduate, and thus awareness will be created. You can think of this as a train consisting of locomotives. We may not be able to achieve a result by just taking one course at the faculty of education. Because it is not a compulsory course and remains an elective, many trained teachers may remain unaware of this project. For this purpose, prospective teachers can be informed by giving seminars and awareness can be created by*

printing the magazines and articles published around the world for this project and distributing them to students. By establishing a club, social solidarity can be achieved among students, faculty members and families.

Bailey: *The project I would prepare would be as follows: I would organize a trip to an energy production center (dams, thermal resources, solar panels, windmills, etc.), if there is one in the province we are in. I would like them to examine the items they use all around them. We would chat about how they worked, and I would have users calculate how much electricity these products consume in an hour, a day, and a month. In short, I would try to raise awareness about energy.*

Teresa, Adam, and Bailey included in their comments the project proposals that they wanted to do regarding sustainability. For example, according to Adam's proposal, the teacher would be the head of the train and the students would be its engines. Thus, the transfer of knowledge and experience continues. Bailey also discussed the importance of raising awareness by seeing and experiencing on-site in his project, which he aims to have done through trips to energy production centers. Teacher candidates suggested these projects to solve their perceptions of the problems encountered in their daily lives. What they all have in common is to gather society and students in one place and try to raise awareness of the SDGs through various activities and events.

Compulsory Course

When teacher candidates' opinions were examined, it was observed that they attached importance to the SDGs being reflected as a compulsory course at every school level. Some of their opinions on this are given below:

Elliott: *These goals should be included in primary, secondary and high school courses in a coordinated manner. In art class, you can have a painting or sculpture work on life in water, in music class, you can have a musical instrument made from waste materials, and in life sciences class, you can have a drama work on hunger. Problem-based learning, project-based learning, etc. I would focus on activities where methods could be used effectively. In this process, I would especially organize the curriculum in a way that would enable students to produce solutions to the problems they encounter in real life by adding them to the curriculum.*

Hans: *We can include activities in our lessons based on sustainability-related achievements in science lessons. For example, we can have our students go out to the school garden and pick up the garbage on the ground during a free activity. We can have art exhibitions related to science. A club related to sustainability can be established. Regarding recycling, waste separation activities can be carried out.*

Bailey: *I believe that in order for teacher candidates to handle these issues, they must first experience them and produce solutions themselves. For this reason, first of all, the information learned in the compulsory course; I recommend that it be reinforced with activities outside the classroom. For example; Vineyard, garden and nature trips for environmental awareness; I would like them to visit their homes and neighborhoods about recycling and examine the living things in these environments they live in. Thereupon, I would design and have activities designed for recycling and for those creatures to see what they should pay attention to and what they could do. Also, during these trips, I would ask people living on the streets and to examine the garbage bins closest to their homes. I would ask if food was thrown away. I would ask those people living on the streets what they need most. I would try to point out how close waste and hunger are.*

Bella: *I would include a course titled "SDG" in the curriculum. I would set it up so that one goal was covered each week. I would take care to teach interactive lessons based on questions such as: What are the problems encountered in the world related to the target, what has been done to solve these problems, and what would you do differently? I would divide the students into groups, give each group a goal, and ask the groups to do extensive research on their goals. I would organize trainings to raise public awareness by ensuring cooperation between Education Faculties and necessary places.*

When the opinions of teacher candidates are examined, it is seen that, based on their own experiences and perceptions, they recommend that development goals be taught as a course in the curriculum at almost all levels. Elliott's idea, which suggests that these objectives should be included in each lesson in a coordinated manner, is quite interesting. Curricula are used in a spiral and intertwined manner. The aim was to include SDGs in these programs. Hans mentioned that the compulsory course should be integrated into the science course because it is already among the achievements in the content of this course. On the other hand, Bailey talked about the importance of candidate teachers experiencing and coming up with solutions themselves. She believes that the issues experienced and perceived on-site will have a greater impact. Bella also stated that collaborating with other institutions and organizations within the scope of the course is important for raising public awareness.

Activities Theme

In the study, after the interviews, participants were given additional time and asked to create activities related to real-life problems related to SDG. One of them, Teresa, suggested that an event could be held regarding the "Zero Hunger"'s goal.

Teresa: *A group of 10-12 people gathers and seeds of plants, flowers and legumes from different parts of the country are collected. It should be a priority for the seeds to be productive and natural seeds, also known as 'ancestral seeds'. A seed bank should then be obtained with the collected seeds. The seed bank should be detailed by separating all seeds with great care and grouping only those with the same seeds. In the first stage, farming should be started using only a small portion of the seeds. The remaining seeds should be stored in a sheltered place as a precaution against disasters such as war, famine, fire and flood, taking into account the storage conditions. Seed collection centers can be used in certain parts of cities to prevent the seeds of the food produced by the seeds used in the first place from being thrown away. These centers must also comply with the seed storage conditions and be hygienic. In order to encourage people, seeds of foods they do not have can be given as gifts in return for the seeds they bring. Thus, both seed productivity and diversity will increase, especially in agricultural regions.*

Hans expressed her views regarding the goal of "Quality Education" as follows:

Hans: *In my opinion, a qualified teacher is at the beginning of a quality education. That's why I would organize events involving children. For example, there would be schools with which the university has an agreement. A science festival can be organized in one of the schools. Teacher candidates can also take part in this festival. Can work with children and learn with them. He/she will both experience the teaching profession and become more qualified with these experiences. In this way, I think we will take another step towards quality education.*

Robert and Bailey suggested that the following activities could be conducted regarding the goal of "Gender Equality".

Robert: *People with whom the activity will be held are asked to take note of the situations of gender inequality they encounter in real life, in their family lives, on social media, in the books and news they read, and in the TV series and movies they watch, for a day or a week. Drama work is performed by selecting one or more of these situations. In the interim evaluations made throughout the drama work, thought-provoking questions are asked about what people who are exposed to gender inequality, who do this, and who have witnessed this situation feel and what they should do.*

Bailey: *I would prepare dramatic situations in which they could put themselves in the place of the opposite sex in social life and ensure that each of the actors played the opposite sex. Thus, I would try to make them empathize with the opposite sex. I would like them to think about how they can impart what they have learned here to children and prepare activities for this. Thus, they can understand gender equality.*

Bailey: *You have seen many times that the water in the seas is dirty. Garbage thrown unconsciously can pollute sea waters. For this purpose, the following activity can be done to raise awareness and sensitivity towards the people around: Under the leadership of one person, a small address can be made to the people sitting on the beach. After talking about sustainability, the garbage on the beach is collected together. There is lifelong learning here. Because there is a 7-year-old girl on the beach and a 40-year-old aunt who will collect the garbage. As is known, there are hunting bans for aquatic life. Individuals should be sensitive to these prohibitions. One should not fish during the prohibited time. For this reason, we must explain this to individuals at a young age and raise their awareness. Because hunting bans are a measure taken to protect our seas and fish.*

Elliot stated that an event could be held regarding both of the "Climate Action and Life on Land" targets.

Elliot: *We can have an activity based on multiple intelligence types. In this way, we also use individualized teaching. After each intelligence group did its own work, their work was opened by the teacher on "Instagram, YouTube, blogs, etc." It can be published on the platforms with the permission of the parents. Students were asked: "What can be done to raise people's awareness about the climate crisis and the problems occurring in terrestrial life and to solve the problems?" The question is asked. Students are divided into groups according to the multiple intelligence method. Each student is in the group he thinks is dominant.*

When we look at the activities suggested by teacher candidates, it can be seen that they generally design activities that can make students active and aim to solve real-life problems related to these SDGs based on their experiences. It was noted that candidate teachers said that they wanted to use these activities in their own classrooms when they became teachers.

Results and Discussion

This study aimed to examine the perceptions and experiences of candidate teachers who received training on SDGs regarding real-world problems. When the topic of sustainability first emerged in the interviews, prospective teachers started to express their opinions starting from real-life problems. This situation was examined in the first theme of this study. Teacher candidates stated that SDGs have a direct relationship with global problems. They also expressed problems arising from this by using their personal experiences. When the opinions of teacher candidates are examined in general, it is seen that they express their opinions about the goals of "Quality education, climate action, no poverty, zero hunger, clean water and sanitation, peace-justice-strong institutions, sustainable cities and communities." In general, their experiences and perceptions are that they live in a world that is full of negative conditions. This situation makes them feel bad and they express that they are unhappy.

According to a study conducted by Students Organizing for Sustainability [SOS] (2021), it is generally stated that sustainable development requires all universities and colleges to be actively involved and promoted. They also stated that the concept of sustainable development was given little or no place in the course curriculum, and that they were disturbed by this. When asked to describe their feelings about climate change and their future, they said that they were worried about. Emanuel and Adams (2011) state in their study that university students are concerned about sustainability and want to volunteer in sustainability projects. Therefore, in the current study, it is understandable that candidate teachers were generally anxious. However, university candidates want to do something to solve real-life problems, both in this study and in other supporting studies.

As a result of their experiences, candidate teachers stated that the world is under some negative conditions regarding sustainability. Their suggestions focus on the development of activities integrated and parallel to the curriculum. "Curriculum" is considered as the second theme, and the sub-themes are "project and compulsory

course.” They also talked about integrating the SDGs into the curriculum. When teacher candidates' opinions are examined, it is seen that opinions that want to add the SDGs to the curriculum as a project are at the forefront; It was observed that they stated that using projects would allow students to compare real-life problems. They stated that they could solve these problems by supporting them with "various trips, games, drama activities, visual activities, seminars, and social solidarity activities". Teacher candidates suggested these "projects" to solve their perceptions of the problems they encountered in their daily lives. The common point of view is to gather society and students at a single point and try to raise awareness of the SDGs through various activities and events. This may indicate that students are searching for solutions to their experiences in their own lives. In addition, when the opinions of prospective teachers are examined, it is seen that in the second sub-theme, based on their own experiences and perceptions, they recommend that development goals be taught as a "compulsory course" in the curriculum at almost all levels. Curricula are used in a spiral and intertwined manner. The aim was to include SDGs in these programs. They also stated that collaborating with other institutions and organizations within the scope of the course is important for raising public awareness.

In fact, when looking at the literature, the sustainability factors defined in Menon and Suresh's (2021) study support the views of candidate teachers in this study. These are: "adding sustainability courses to the curriculum, adopting student-centered, interactive, participatory learning approaches, supporting interdisciplinary studies, education based on innovative pedagogy, teacher training, leadership, incorporating sustainability perspectives and values into the curriculum, networking skills, change and transformation skills, being able to work with different stakeholders, cooperation between academics, university-industry collaborations, community programs and projects, research on social problems, holistic approaches, interdisciplinary research; "increasing leadership capacity, increasing public awareness, dissemination of information, use of social media. "Therefore, the project and compulsory course suggestions that teacher candidates consider integrated and parallel to the curriculum are supported. In addition, the opinions emerging from the interviews coincide exactly with Menon and Suresh's (2021) efforts to integrate sustainability factors into higher education.

For example, let us draw attention to the following sentence among the opinions of a teacher candidate: *"Achievements such as sustainable living, economical use of resources and recycling are included in the program." We can include activities in our lessons based on these achievements. Another teacher candidate said; "Studies on the importance of sustainability, the cause and consequences of resource insufficiency, and what the state of our environment could be if we use resources regularly, cleanly and reproducibly can be done as a project. "I would also add the benefits of practical internships related to sustainability in various organizations to the program."* It supports these views; Yıldız et al. (2021) also stated in their study that providing university students with training on environmental problems, developing projects to raise environmental awareness and creating a sustainable natural environment will make positive contributions to the development of individuals' attitudes towards the environment. There are also studies indicating that it would be appropriate to present sustainability-based environmental education both as a separate course and as intertwined with other courses (Alim, 2006; Stokes, Edge, & West, 2001; Tanrıverdi, 2009).

Sustainable environmental education can be associated with students learning the importance of the environment, correcting mistakes regarding environmental problems, and implementing correct practices. It is thought that students receiving effective environmental education for a sustainable future will enable them to have a correct environmental perspective and develop attitudes towards environmental problems by transforming this perspective into behavior and becoming role models for future generations. When the relevant literature is examined, it is possible to come across studies in which students receiving education on environmental sustainability improve their attitudes towards environmental problems. (Gallagher et al., 2000; Larijani & Yeshodhara, 2008; Raut & Pendse, 2013; Tanrıverdi, 2009; Kayalı, 2010; Yıldız, et al. 2021).

In this study, it was observed that teacher candidates prepared activities by prioritizing the SDGs that they thought were important in their questions regarding activity suggestions for solving real-life problems. According to these activities, students at all levels and every person in daily life stated that they should be mobilized, raise awareness in some way, and protect our world. This situation shows that candidate teachers make an effort despite everything and is pleasing. When we look at the activities suggested by the candidate teachers, it is generally seen that they design activities that can make students active, aim to solve real-life problems related to these SDGs based on their experiences, and are based on the principle of near to far. To give an example; "creating seed banks, organizing science festivals where children can be together, more teacher support to regions in difficult situations, identifying and discussing gender inequalities in social media and personal life, empathy and drama studies, collecting garbage on the beach together with all the people and multiple intelligence for climate action." studies, " are among them. What is meant by the principle of near to far here is that it is necessary to start by taking advantage of elements close to the child's own life and to reach

those far away and the whole world. Tanrıverdi (2009) states that this issue should be given importance. Again, this supports these results; Evangelinos et al. (2009) showed that university students stated that courses and activities at the academy were important in protecting the environment and nature. However, they stated that they expected support from universities and other organizations to be sufficiently active.

Conclusion

As a result, when the opinions and activities stated by the candidate teachers based on their own experiences are examined, it is seen that they have an accumulation of knowledge towards sustainable development. However, they are also aware of real-life problems experienced in our country and the world. Therefore, it is obvious that they have some suggestions and things that they want to do regarding these issues. In this regard, all the humanities, especially educators and researchers, have great duties.

This study is limited to teacher candidates in the city center of Istanbul, which is the most cosmopolitan and most populated province in Turkey and therefore has all kinds of environmental and sustainability problems. With its crowdedness and constant immigration from different countries, it brings globalization and various environmental problems. In this context, the study results can be generalized to similar situations in similar countries.

Recommendations

Based on the results of this research, the following can be suggested for future studies:

- Teacher candidates focused on certain goals in the real-life problems and activities section. However, there are also SDGs other than those set by the United Nations. For these, events can be prepared and various studies can be conducted.
- In this study, two parts—courses and projects—are mentioned in the process of integrating the SDGs into the curriculum, and brief examples are provided. In future studies, this can be addressed specifically for various courses, and if there is a truly integrated goal, its impact on future students and humanity can be examined.
- In this study, various activities were prepared by considering the SDGs. Future studies may include the application of these activities to the classroom environment. Thus, their impact on students can be examined using qualitative or quantitative research methods.

Scientific Ethics Declaration

* The author declares that the scientific, ethical, and legal responsibility of this article published in the JESEH journal belongs to the author..

*The author acknowledged that all ethical rules were followed in the study.

Conflict of Interest

* The author declares that there is no conflict of interest.

Funding

* This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Acknowledgements or Notes

* The authors would like to thank the conference scientific committee and referees for their feedback on the article.

References

- Aktas, C. B. (2015). Reflections on interdisciplinary sustainability research with undergraduate students. *International Journal of Sustainability in Higher Education*, 16(3), 354-366.
- Aleixo A. M., Leal S., & Azeiteiro, U. M. (2021) Higher education students' perceptions of sustainable development in Portugal. *J Cleaner Prod*, 327, 1-15. <https://doi.org/10.1016/j.jclepro.2021.129429>
- Alim, M. (2006). Avrupa birliği üyelik sürecinde Türkiye'de çevre ve ilköğretimde çevre eğitimi. *Kastamonu Eğitim Dergisi*, 14(2), 599- 616.
- Annels, M. (2006). Triangulation of qualitative approaches: hermeneutical phenomenology and grounded theory. *Journal of Advanced Nursing*, 56(1), 55-61. <https://doi.org/10.1111/j.1365-2648.2006.03979.x>
- Avsec, S., & Ferik Savec, V. (2021). Pre-service teachers' perceptions of, and experiences with, technology-enhanced transformative learning towards education for sustainable development. *Sustainability*, 13(18), 10443. doi: <https://doi.org/10.3390/su131810443>
- Boca, G. D., & Saraçlı, S. (2019) Environmental education and student's perception, for sustainability. *Sustainability*, 11, 1553. <https://doi.org/10.3390/su11061553>
- Bodner, G. M. (1986). Constructivism: a theory of knowledge. *Journal Chemical Education*, 63 (10), 873-878.
- Brooks, J. G., & Brooks, M. G. (1999). *In search of understanding the case for constructivist classrooms*. Virginia: Association For Supervision And Curriculum Development.
- Chan, C. K. Y, Fong E. T. Y., & Luk L. Y. Y. (2017). A review of literature on challenges in the development and implementation of generic competencies in higher education curriculum. *Int J Educ Dev*, 57, 1-10. <https://doi.org/10.1016/j.ijedudev.2017.08.010>
- Chuvieco, E., Burgui, M., & Silva, E. (2018) Factors affecting environmental sustainability habits of university students: intercomparison analysis in three countries (Spain, Brazil and UAE). *J Cleaner Prod.*, 198, 1372-1380. <https://doi.org/10.1016/j.jclepro.2018.07.121>
- Creswell, J. W. (2007). *Qualitative inquiry & research design: choosing among five approaches (3rd edition)*. Thousand Oaks: Sage.
- Dagiliūtė, R., Liobikienė, G., & Minelgaitė, A. (2018). Sustainability at universities: students' perceptions from green and non-green universities. *J Cleaner Prod.*, 181, 473-482. <https://doi.org/10.1016/j.jclepro.2018.01.213>
- Emanuel, R., & Adams, J. N. (2011). College students' perceptions of campus sustainability. *International Journal of Sustainability in Higher Education*, 12(1), 79-92.
- Ersoy, A. F. (2019). Fenomenoloji. A. Saban ve A. Ersoy (Ed.), *Eğitimde nitel araştırma desenleri* içinde (s. 81-139). Anı.
- Evangelinos, K. I., Jones, N., & Panoriou, E. M. (2009). Challenges and opportunities for sustainability in regional universities: a case study in Mytilene, Greece. *Journal of Cleaner Production*, 17(12), 1154-1161.
- Fosnot, C. T. (2007). *Oluşturmacılık: teori, perspektifler ve uygulama*. S. Durmuş (Trans.). Ankara: Nobel Yayın Dağıtım.
- Franz, N. (2022). *The technology for a fruitful future? analysing un policies on blockchain for sustainable development* [Unpublished Master's Thesis]. Malmö University.
- Hendry, G. D. (1996). Constructivism and educational practice. *Australian Journal of Education*, 40 (1), 19-45.
- Hendry, G. D., Frommer, M., & Walker, R. A. (1999). Constructivism and problem-based. *Journal of Further and Higher Education*, 23(3), 359-371.
- Howe, K. R., & Berv, J. (2000). Constructing constructivism, epistemological and pedagogical. In D. C. Phillips (Ed.), *Constructivism in Education: Opinions and Second Opinions on Controversial Issues*. The University of Chicago Press.
- Gallagher, J., Wheeler, C., Mcdonough, M., & Namfa, B. (2000). Sustainable environmental_education for a sustainable environment: lessons from thailand for other nations. S. Belkin (Ed.), in *Environmental Challenges*. Springer.
- Garcia J., da Silva, S. A., Carvalho, A. S., de Andrade Guerra, J. B. S. O. (2017). Education for sustainable development and its role in the promotion of the sustainable development goals. J. Davim (Ed.), in *Curricula for Sustainability in Higher Education Management and Industrial Engineering* (pp. 1-18). Springer. <https://doi.org/10.1007/978-3-319-56505-7>
- García-González, E., Jiménez-Fontana, R., & Azcárate, P. (2020) . Education for sustainability and the sustainable development goals: pre-service teachers' perceptions and knowledge. *Sustainability*, 12, 7741. doi:10.3390/su12187741.
- García-Morís, R., & Martínez-Medina, R. (2022). Trainee teachers' perceptions of socio-environmental problems for curriculum development. *Soc. Sci.* 11(10), 445. doi: <https://doi.org/10.3390/socsci11100445>

- Karatzoglou, B. (2013). An in-depth literature review of the evolving roles and contributions of universities to education for sustainable development. *J Cleaner Prod*, 49, 44-53. <https://doi.org/10.1016/j.jclepro.2012.07.043>
- Kayalı, H. (2010). Sosyal bilgiler, türkçe ve sınıf öğretmenliği öğretmen adaylarının çevre sorunlarına yönelik tutumları. *Marmara Coğrafya Dergisi*, 21, 258-268.
- Larijani, M., & Yeshodhara, K. (2008). An empirical study of environmental attitude among higher primary school teachers of India and Iran. *Journal of Human Ecology*, 24(3), 195-200.
- Lozano, R., Lukman, R., Lozano, F. J., et al. (2013). Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *J Cleaner Prod*, 48, 10-19. <https://doi.org/10.1016/j.jclepro.2011.10.006>
- McKenzie, S. (2004). Social sustainability: towards some definitions. *Hawke Research Institute Working Paper Series*, 27, 1-29.
- Menon, S., & Suresh, M. (2021). Modelling the enablers of sustainability in higher education institutions. *Journal of Modelling in Management*. <https://doi.org/10.1108/JM2-07-2019-0169>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.
- Moustakas, C. (1994). *Phenomenological research methods*. Sage.
- Patton, M. Q. (1987). *How to use qualitative methods in evaluation*. Sage.
- Philips, D. C., & Soltis, J. K. (2005). In S. Durmuş (Trans. Ed.), *Perspectives on Learning*. Ankara: Nobel Yayın Dağıtım.
- Perez-Foguet, A., Lazzarini, B., & Gine, R. (2018). Promoting sustainable human development in engineering: assessment of online courses within continuing professional development strategies. *J Cleaner Prod*, 172, 4286-4302. <https://doi.org/10.1016/j.jclepro.2017.06.244>
- Raut, N., & Pendse, M. (2023). A study of conscious consumerism of sustainable products among the university students. In *Transformation for Sustainable Business and Management Practices: Exploring the Spectrum of Industry 5.0* (pp. 105-117). Emerald.
- Rieckmann, M. (2012). Future-oriented higher education: which key competencies should be fostered through university teaching and learning? *Futures*, 44, 127-135. <https://doi.org/10.1016/j.futures.2011.09.005>
- Ruiz-Mallén, I., & Heras, M. (2020). What sustainability? Higher education institutions' pathways to reach the agenda 2030 goals. *Sustainability*, 12(4), 1290. <https://doi.org/10.3390/su12041290>
- Schunk, D. H. (2011). Yapılandırmacı teori. In M. Y. Demir (Trans.), *learning theories an educational perspective: öğrenme teorileri eğitimsel bir bakışla* (pp. 234-277). Nobel Yayınları.
- Sibbel, A. (2009) Pathways towards sustainability through higher education. *Int J Sustainability Higher Educ.*, 10, 68-82. <https://doi.org/10.1108/14676370910925262>
- Stokes, E., Edge, A., & West, A. (2001). *Environmental education in the educational systems of the European Union*. Centre for educational research london school of economics and political science. Commissioned by the Environment Directorate-General of the European Commission.
- Students Organising for Sustainability [SOS]. (2021). *Students organising for sustainability international summit*. https://sos.earth/wp-content/uploads/2021/02/SOS-International-Sustainability-in-Education-International-Survey-Report_FINAL.pdf
- Tanrıverdi, B. (2009). Sürdürülebilir çevre eğitimi açısından ilköğretim programlarının değerlendirilmesi. *Eğitim ve Bilim*, 34(151), 89-103.
- Uiterkamp, A. J. M. S., & Vlek, C. (2007), Practice and outcomes of multidisciplinary research for environmental sustainability, *Journal of Social Issues*, 63(1), 175-197.
- UNDP, (2015). *Sustainable Development Goals*. <http://www.tr.undp.org>
- UNFCCC. (2015). *The Paris Agreement*. United Nations Framework Convention on Climate Change. Available at: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> (Accessed: 18 February 2026).
- United Nations Educational Scientific and Cultural Organization (UNESCO), (1997). *Record of the general conference*, Paris. Available from: <https://unesdoc.unesco.org/ark:/48223/pf0000114588>.
- United Nations Educational Scientific and Cultural Organization (UNESCO), (2022). The concept of sustainability and its contribution towards quality transformative education: thematic paper, Paris. Available from: <https://unesdoc.unesco.org/ark:/48223/pf0000381528>.
- Velazquez, L., Munguia, N., & Sanchez, M. (2005) Deterring sustainability in higher education institutions: An appraisal of the factors which influence sustainability in higher education institutions. *Int J Sustainability Higher Educ.*, 6, 383-391. <https://doi.org/10.1108/1467637051062386>
- World Commission on Environment and Development (WECD), (1987). *Our Common Future*. Oxford University Press. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.
- Wright, T. S. A. (2002). Definitions and frameworks for environmental sustainability in higher education. *High Educ Policy*, 15, 105-120. [https://doi.org/10.1016/S0952-8733\(02\)00002-8](https://doi.org/10.1016/S0952-8733(02)00002-8)

- Yıldız, K., Güzel-Gürbüz, P., Esentaş, M., Beşikçi, T., & Balıkçı, İ. (2021). Üniversite öğrencilerinin sürdürülebilir çevre eğitimi ve çevre sorunlarına yönelik tutumları arasındaki ilişkinin incelenmesi. *International Journal of Social Science Research*, 10(1), 35-49.
- Zimmerman, E., Peschl, F. M., & Nassek-Röhmer, B. (2010). Constructivist curriculum design for the interdisciplinary study programme. *Education Science*, 5(3), 144-157.

Author(s) Information

Nur Utkur-Gulluhan

Istanbul University-Cerrahpaşa,
Faculty of Hasan Ali Yücel Education, Department of
Primary Education, İstanbul/Türkiye
Contact e-mail: nur.utkur@iuc.edu.tr
ORCID iD: <https://orcid.org/0000-0003-2062-5430>
