International Research Journal of Multidisciplinary Scope (IRJMS), 2025; 6(3): 1-15 IRJMS

Original Article | ISSN (O): 2582-631X DOI: 10.47857/irjms.2025.v06i03.05636

Evaluation of University Students' Awareness of Sustainable Development Goals: The Example of Zonguldak Bülent Ecevit University Çaycuma Campus

Deniz karaelmas[1]*, H Burcin Henden Solt[2]

[1]Zonguldak Bülent Ecevit University, Çaycuma Vocatinal School, Department of Design, Zonguldak, Turkey, [2]Zonguldak Bülent Ecevit University, Alaplı Vocatinal School, Department of Architecture and Urban Planning, Zonguldak, Turkey. *Corresponding Author's Email: deniz.karaelmas@beun.edu.tr

Abstract

Sustainability has become a necessity rather than a concept used for many areas such as education, environment, economy, national and international government policies, use of natural resources and energy resources, production and society. Today, a clean environment and resources transferred to future generations are of vital importance for human life. Humans, society and the environment are ecologically interrelated. In order to continue an ecological life, people have to consume renewable materials. Thus, in the process, people have increased their resource use rates and the rate of environmental degradation has also increased. In this context, universities act as knowledge and innovation centers responsible for educating the next generation of sustainability leaders and thinkers while promoting sustainable development practices. Universities have long held an important place in the realization of the Sustainable Development Goals (SDG) because they have been the strengths of national, global and local innovation and social well-being. The SDGs were created to mobilize countries around the world to combat inequalities, combat climate change, end all forms of poverty and ensure that no one is left behind. In this article, a survey study targeting Zonguldak Bülent Ecevit University (BEUN) students was conducted to investigate the knowledge and awareness of students at BEUN Çaycuma campus about SDGs and to reveal how they realize sustainability. It is thought that it would be positive for the university to increase awareness studies on sustainability, implement strategic action plans and include students more in the process.

Keywords: Awareness, Perception, SDG's, Sustainability, University.

Introduction

Human beings have lived in a relationship with the environment since their existence. From the earliest times to the present, people have met their needs from nature. As time went by, with advances in science and technology, people have also used nature generously on their way to reaching an advanced level of civilization. This amount of use has reached its highest level with the contribution of population growth depending on the requirements of the age. However, nature also has a capacity. As a result of the unconscious use of resources used to meet needs, the damage and even consumption of resources as a result of unconscious use, an unhealthy environment has emerged in most parts of the world where there are no suitable conditions for living life (1). In recent years, increasing environmental problems worldwide have made the concept of climate change and sustainable development a necessity. Problems such as global temperature increases, frequency and severity of natural disasters and loss of biodiversity have serious impacts not only on the environment but also on economic and social dimensions (2). Global climate change and sustainable development are among the most important global problems of the modern world. As a result of imbalances in the atmosphere caused by human-induced greenhouse gas emissions, climate change increases the frequency of natural disasters, negatively affects agricultural production, and causes loss of biodiversity (3). These threats created by the global environmental crisis have made the concept of sustainable development not only a goal but also a necessity. Sustainable development was defined in the Brundtland Report published by the United Nations in 1987 as "development that meets the needs of present generations without compromising the ability of future generations to meet their needs" (4). This approach draws

(Received 13th April 2025; Accepted 23rd June 2025; Published 20th July 2025)

attention to the need to balance economic development with environmental and social dimensions (5, 6). Sustainable Development Goals (SDGs) were declared by the United Nations in 2015 and consist of 17 basic goals aimed to be achieved by 2030. These goals include multidimensional goals such as ending poverty, reducing inequalities, combating climate change, quality education and access to clean energy (7, 8). At this point, universities play important roles not only as institutions that produce knowledge, but also in transferring and disseminating sustainability principles to society. Universities are in a strategic position in terms of shaping the knowledge, attitudes and behaviors of young individuals (9, 10). In order to achieve sustainable development goals, universities prioritizing these goals in their education and training activities encourage the development of environmental awareness and sustainable lifestyles in students (11, 12).

In this study, a survey was conducted to investigate the knowledge and awareness of students at the Zonguldak Bülent Ecevit University (BEUN) Çaycuma Campus located in the Western Black Sea region of Türkiye about the Sustainable Development Goals and to reveal how they realize sustainability. Information was obtained about the knowledge levels, attitudes and behaviors of students about sustainability and sustainable development goals. The strategies that universities should develop for young people who are knowledgeable but cannot transfer this to their daily life behaviors were emphasized. Taking steps for the sustainable future of the world is an important responsibility.

Sustainability Development Goals: Conceptual Explanation

The term sustainability has been referred to as sustainable development since the Brundtland Report (4). Sustainable Development, in other words, is also considered as not ignoring the environmental dimension while evaluating development from an economic perspective and aiming to use the resources used in a balanced and thrifty manner considering future generations (5, 6, 13). The goals of sustainable development in the Our Common Future (Brundtland Report) Report are listed as follows (14):

- Stimulating expansion
- Changing the principle of expansion
- Meeting basic needs
- Ensuring a sustainable population size
- Enrich and protect the source database
- Managing technology and seeing risk
- Integrating the environment and economy when making decisions.

In addition to these goals, there are three main dimensions in sustainable development. These are social sustainability, cultural and ecological sustainability, and economic sustainability. Ecological sustainability includes the necessary ecological processes, ensuring biodiversity, and the sustainability of biological resources. Social and cultural sustainability; It provides local self-confidence, social accountability, and strengthening the creation of identity for the society. Economic sustainability is to provide the necessary economic development and provide natural and cultural resources for inheritance to future generations (15).

As people developed technology and became an industrial society, environmental pollution increased and nature began to be destroyed. This situation gained momentum in the 1970s and has continued to develop until today (4).

Sustainability is a teaching and awareness movement that covers many areas from ecology to the environment, from basic nutrition to advanced agriculture, from health to service, from clean air and water to usable natural resources, from business life to technology, and that aims to meet the basic needs of all living and non-living beings, prevent the waste of resources taken from nature, and share these resources with future generations (16).

Following these developments, various conferences involving international collaborations were held to improve the environment and ensure the sustainability of existing resources. The first of these conferences, which also shaped environmental education, was the United Nations (UN) Conference on the Human Environment, hosted by the United Nations in Stockholm in 1972. 113 countries, including Türkiye, participated in the conference. This conference was the first world conference to address environmental issues as an important problem. The conference recommended that action be taken to prepare an international program for environmental education with an inclusive and interdisciplinary approach for all people (from students to all citizens). In addition,

with the decision taken in Stockholm, June 5 was accepted as World Environment Day (17).

At the United Nations General Assembly held in September 2000, delegates from all member states reached a common view that strengthening equality, human dignity and social welfare globally is the common responsibility of the nations of the world. In this direction, an approach aiming to achieve progress in economic, environmental and social areas by 2015 was adopted and the Millennium Declaration, which includes these goals, was unanimously declared (18).

The United Nations Development Program (UNDP) was established by the UN to establish the Global Development Network (19). This formation works on the implementation of the Sustainable Development Goals, which came into force in 2015 and emerged with a fifteen-year goal. They state that their main priorities are to work on these goals in line with the fifteen-year plan and to inform countries, to ensure that they prioritize these goals in their countries and create their development plans accordingly. The Sustainable Development Goals (SDGs), in other words the Global Goals, are expressed by UNDP Turkey as "a universal action declaration to protect our planet, eliminate poverty, and ensure that all people live in prosperity and peace" (8).

The Millennium Development Goals (MDGs) are structured in a way that will reveal the progress made by each country in sustainable development and poverty reduction up to 2015 in a measurable and trackable manner. At the Sustainable Development Summit organized by the United Nations in September 2015, the 15-year implementation process of the MDGs adopted in 2000 was evaluated on a global scale; however, it was stated that these goals did not produce the expected level of solutions to the economic, social and environmental problems facing our world. The summit emphasized that in light of the experiences gained from the MDG process, new sustainable development goals should be determined that can provide more comprehensive and effective solutions to existing global problems. In this context, the 2030 Sustainable Development Goals (SDG 2030), accepted by the joint decision of 193 countries including Türkiye, consist of 17 main goals and 169 sub-goals related to these goals. The new global development agenda aims to direct the development plans and policies of countries with an understanding that prioritizes human rights for all individuals until 2030 shown in Figure 1 (20).

Deena Robinson clearly states that the increasing carbon dioxide rate in the atmosphere, the increase in temperature, the misuse of fuels and the increasing greenhouse gases are triggering the climate crisis, the increasing environmental pollution due to “fast fashion” and textile waste and the increasing plastic waste, almost 91% of which is not recycled, the 68% decrease in biodiversity between 1970 and 2016, if no intervention is made, all of the world's forests will be destroyed in less than 100 years, with only 10% of the world's forests remaining by 2030, the increasing water levels due to melting glaciers are threatening the lives of people living especially on the coastline due to reasons such as floods and tsunamis, and will continue to do so, and the wasteful management added to all these factors will rapidly negatively affect this process (21).

Figure 1: Sustainable Development Goals Representations (19)

The Role of Universities in Education for Sustainable Development

In order to achieve the Sustainable Development Goals mentioned above by 2030, it is of great importance to strengthen the sustainable development discourse all over the world, to spread it to all areas and to accelerate the process. In this context, instead of being content with international agreements and the efforts of states, all actors should take responsibility and contribute to the process. The involvement of the business world, civil society organizations and individuals in this process is of critical importance in achieving the goals on time. Universities stand out as one of the most important concepts in the process of providing education, creating the basis for the adoption of new ideas and the dissemination of these ideas, raising awareness in society, encouraging research and being a role model for society (9).

The transition to a knowledge economy, the changing university-society-industry relations, the diversification of the roles that universities play and are expected to play both locally and globally, and the ever-greater involvement of states in higher education have already deeply shaken the traditional understanding of higher education; and have led to the emergence of a new higher education model that embraces accountability, performance-orientedness, research and education as well as entrepreneurship all over the world (22). In this context, sustainability discussions that have an impact in almost every field and studies on what related concepts mean for universities can make significant contributions both to increasing the understanding of the concept of sustainability and to the transformation of higher education institutions into sustainable institutions (23).

Universities' approaches to sustainable development can manifest themselves in many different ways. In any case, it is clear that universities have a major role to play and should play for sustainability and sustainable development (10).

An important development in the literature on sustainability in higher education is the recent publication of a new ranking by Times Higher Education. This ranking, planned to be published annually under the name of World University Impact Rankings, aims to relate 17 sustainable development goals to higher education. In this context, all universities that share data can find a place in the ranking list.

Another prominent ranking for sustainability in higher education is the UI Green Metric ranking. The main indicators in this ranking, which is stated to be created based on the three components of sustainability: environment, society and economy, are determined as energy and climate change (21%), campus and infrastructure (15%), education and research (18%), waste (18%), transportation (18%) and water (10%). Criteria are also determined under each indicator. For example, under the transportation indicator, there are criteria such as the total number of motor vehicles in proportion to the campus population, zero-emission vehicle policy, the ratio of parking areas on campus, the number of initiatives to reduce private car use and pedestrian paths. Under the education and research indicator, the ratio of sustainability courses to total courses at the university, the ratio of sustainability research in total research funds, the number of sustainability-related events, the sustainability report, the number of cultural events on campus and the university's sustainability website are some of the criteria. It is seen that 71 universities from Türkiye are listed in the latest published report, and the first five are Istanbul Technical University, Özyeğin University, Erciyes University, Yıldız Technical University and Ege University. Istanbul Technical University, the most successful in Türkiye, is ranked 57th in the world general ranking. While only 95 universities were included in the ranking in the first report published in 2010, there are a total of 956 universities in the latest report published in 2021 (12).

Universities that make sustainability a part of their higher education mission and vision also lead the way in creating a sustainable lifestyle for society in terms of environmental, social and economic aspects while carrying out their educational activities. Universities; Through the programs and courses they open in improving environmental, economic and social conditions, they both produce solutions to social problems and contribute to the formation of norms and values in behavioral change (11).

In Turkey, on October 4, 2022, the "Cooperation Protocol on the Establishment of a Sustainable and Climate-Friendly Campus Project" was signed with

the participation of the Ministry of Environment, Urbanization and Climate Change, the Ministry of Energy and Natural Resources, and the Council of Higher Education. Karabük University, Ege University, Istanbul Technical University, Hacettepe University, Bartın University, Gazi University, Niğde Ömer Halis Demir University, Selçuk University, Middle East Technical University, Yıldız Technical University, and Van Yüzüncü Yıl University were determined as pilot universities in the project. The Sustainable and Climate-Friendly Campus Project covers the implementation of various sustainability practices such as energy efficiency, water management, waste reduction, green buildings, sustainable transportation, and community participation on university campuses. BEUN aims to both contribute to the fight against climate change and raise social awareness with the 2200-square-meter green roof project implemented in the Faculty of Engineering building. This innovative project, which is a first in Zonguldak, also sets a pioneering example among state universities. The green roof application points to the university's environmental responsibility and sustainability approach, while also offering many environmental benefits such as energy saving, water management and thermal insulation. With this project, not only contributing to the local ecosystem but also raising awareness about climate change and environmental awareness are among the university's main goals. It is anticipated that approximately 54,853 kWh of electricity will be generated annually with the solar energy plant installed on the roof of the BEUN Farabi Campus cafeteria building and the GES with a total installed power of 40 kWp, and that 2.5 percent of the annual energy need of the Farabi Campus will be met from clean, renewable energy sources. In addition, it has been calculated that approximately 32,911 kg of CO_2 emissions will be prevented annually with the solar energy plant to be established, depending on the reduction of CO_2 and greenhouse gases resulting from the use of fossil fuels in electricity production by using renewable energy sources. This prevented emission value is equivalent to planting approximately 641 trees annually. It has started to convert pre-meal and post-meal waste from student meals at Farabi and Ibn Sina Campuses into compost with machines. It exhibits 'Climate Friendly Campus' studies and good practice examples in order to minimize the effects of waste in a world experiencing climate and drought crisis by converting waste into compost. Therefore, it is very valuable to accelerate the integration of Sustainable Development Goals into higher education and to be able to draw attention to these issues.

Erciyes University's 2019 sustainability report includes the team message and summary sections followed by waste, climate and energy, structure and infrastructure, water and wastewater, education and transportation. Under the main title of waste, the waste directive and waste management, recyclable waste management, hazardous waste management and organic waste management were evaluated. Under the main title of climate and energy, energy consumption and efficient applications on campus, renewable resources, smart building applications, carbon footprint were explained. Under the main title of structure and infrastructure, information on campus and social areas, forest areas and newly planted saplings, campus living spaces was provided. Studies on the subject were presented under the main titles of water - wastewater, education and transportation (24).

In the 2019 sustainability report of Özyeğin University, after general information, information such as report editor and operation summaries were included under the main heading of environmental and social management. Under the main heading of occupational health and safety, information was provided under the subheadings of Turkey compliance, statistical information, life and fire safety and important occupational health and safety events. In addition to these, important environmental and social events, general information and feedback, sustainability and benefit management were presented under the main headings and the report was concluded by providing information on the progress of the environmental and social action plan (24). Yıldız Technical University started its 2020 sustainability campus report with presentation and introduction sections by providing information on the process, team, figures and history. The report included the main headings of management, site selection and land use, resource management, waste management, building management, ecosystem, health and life and education and research. It was

determined that the report was supported by visuals and graphics (24).

Methodology

The main purpose of this study is to evaluate the awareness of university students about sustainable development goals. The study area consists of students from different departments in Çaycuma Vocational School and Çaycuma Food and Agriculture Vocational School located in BEUN Çaycuma Campus. There are several main reasons why the Çaycuma Campus of Zonguldak Bülent Ecevit University was chosen as the research area in this study. First of all, the campus offers interdisciplinary diversity in terms of student profile due to the fact that it hosts many different vocational school programs. This diversity allows sustainable development awareness to be evaluated from different professional perspectives and increases the generalizability of the research. Secondly, the geographical location of the campus provides a suitable context for the multidimensional evaluation of sustainability perception due to its location in a transitional region that hosts urban and rural environmental characteristics together. The level of interaction of students with the natural environment and their environmental awareness become more clearly observable in such semi-rural areas. Thirdly, there are various environmental projects on the campus such as compost production, rainwater harvesting, edible landscape solar energy systems, which shows that the campus has a vision that is consistent with the principles of sustainability. This allows the campus to be used not only as a research area but also as an applied sample area. Finally, the fact that the researcher works on this campus facilitates data access, increases the motivation of the participants to participate in the research, and provides an advantage in terms of data reliability. One of the factors in choosing Çaycuma campus as the application area is that the settlement where the campus is located is quite rich in terms of green areas. In addition, one of the researchers works in this unit. Çaycuma district, where the campus is located, is established on Filyos stream and the valley formed by this stream and is located east of Zonguldak city center. Black Sea is to the north, Bartın to the east, and Devrek districts to the south. Çaycuma district, with a surface area of 490 km2, is located between 41°25'N, 32°4'E latitudes. It has a mountainous and rugged terrain structure (25). BEUN was founded in 1924 and is among the long-established universities of Turkey. Çaycuma campus was established in 2001 under BEUN. The Çaycuma campus, which is a research area, has 802,630 m2 ^{of} open space and 18,996 m^2 of closed space (26). In the 2024-2025 academic year, a total of 2576 students are studying at Bülent Ecevit University Çaycuma Campus (Figure 2).

Figure 2: View from BEUN Çaycuma Campus (Originals)

Statistical Analysis

In this study, we conducted a survey to investigate the knowledge and awareness of students studying in different programs at BEUN Çaycuma Vocational School and Çaycuma Food and Agriculture Vocational School about sustainable development

goals and to reveal how they realize sustainability. It was used in the preparation of the survey questions and the necessary permissions were obtained from the authors (27). The survey consists of a total of 44 questions. A random sampling method was chosen to determine the students who participated in the survey. A total of 489 students were surveyed between February and March 2025. The surveys were administered to the students in the classrooms upon the request of the participants. Before the survey application, the students were informed about the purpose and scope of the survey. The survey application was completed in an average of 15 minutes per participant. 466 of the 489 surveys applied were considered valid. SPSS 27.0 statistical package program was used in the evaluation of the survey. The results of the demographic characteristics, knowledge, attitude and application scales are shown as frequency percentage. For inferential analysis, Spearman's rho correlation coefficient was used to determine the relationships between variables (practice and knowledge, practice and attitude, knowledge and attitude). Correlation $p < 0.01$ was accepted as significant. Negatively formed items were recoded accordingly.

Results and Discussion

The critical role of education in achieving sustainable development and empowering future generations is emphasized in many studies (28-33). From this perspective, in this study, a survey was conducted to investigate the knowledge and awareness of university students about the SDGs and to reveal how they realize sustainability, and the following findings were obtained. The study included 192 male (36%) and 342 female (64%) students. 466 (87.3%) were between the ages of 18-22. Students from Foreign Languages and Cultures, Veterinary Medicine, Food Processing, Property Protection and Security, Office Services and Secretarial, Management and Organization, Transportation Services, Chemistry and Chemical Processing Technologies, Forestry, Mining and Mineral Extraction and Design departments. The demographic characteristics of the participants in our study are given in Table 1.

Table 1: Demographic Characteristics

Variables		**Dear**	**Percentage (%)**
Gender	Male	192	36.0
	Woman	342	64.0
	18-22	466	87.3
	23-27	51	9.6
Age	28-32	6	1.1
	33 and above	7	1.3
	18-22, 23-27	4	0.7
	Department of Foreign Languages and Cultures	138	25.8
	Department of Veterinary Medicine	50	9.4
	Food Processing Department	43	8.1
	Property Protection and Security Department	23	4.3
	Office Services and Secretarial	2	0.4
Section	Department		
	Department of Management and Organization	7	1.3
	Department of Transportation Services	108	20.2
	Department of Chemistry and Chemical Processing Technologies	42	7.9
	Department of Forestry	59	11.0
	Mining and Extraction Department	46	8.6
	Design Department	11	2.1
Class	1. class	302	56.6
	2. class	232	43.4

	Province	175	32.8
Place of residence	District	238	44.6
	Bay	121	22.6

As can be seen in Table 2, participants were asked questions about sustainability and sustainable development goals. It is observed that the students' knowledge levels are generally high; the rate of those who gave positive answers to the questions varies between 20.2% and 96.14%. The highest percentage of positive answers (yes) was the item "The misuse of natural resources affects the well-being of future generations" with a rate of 96.14%. This result shows that the vast majority of participants understand the importance of sustainable use of natural resources. The risk of depletion of resources is seen as a major concern for future generations. The lowest percentage of positive answers (yes) was the item "I took a course where sustainable development goals (SDGs) were explained" with a rate of 20.2%. When asked whether they had taken a course where sustainable development goals (SDGs) were explained, the majority of students (79.8%) answered no. It is seen that sustainable development goals are not sufficiently covered in the curriculum and the rate of participants receiving training on this subject is low. This situation has led to the fact that courses related to SDGs should be included in course catalogs. When the knowledge levels of higher education students who participated in the survey conducted by Al-Nuaimi and Al-Ghamdi are examined, it is seen that more than 80% have a sufficient understanding of sustainability-related information (34). In the 2020 study 95% of the students responded positively to the statement “Excessive use of natural resources affects the well-being of future generations”, which is the essence of the SDGs. Similarly, in this study, the same statement was responded positively with a rate of 96.14% (27).

Table 2: Percentage of Student Knowledge on Sustainable Development Goals

	Items	**Yes (n)**	**Yes (%)**	**No (n)**	**No (%)**
K1	Do you know what sustainability is?	471	88.2	63	11.8
K2	I heard the words Sustainable Development Goals (SDG).	300	56.2	232	43.4
K3	I took a course on the sustainable development goals (SDGs).	108	20.2	426	79.8
K4	Environmental protection and education are the most important elements for sustainable development.	496	92.4	38	7.1
K5	Misuse of natural resources affects the future of generations.	515	96.14	18	3.4
K6	Fundamental elements of a nation include environmental protection, economic progress, and social equality.	510	95.5	22	4.1
K7	I know that the Sustainable Development Goals are planned to be completed by 2030.	212	39.7	322	60.3
K8	Excessive consumption of renewable resources reduces greenhouse gas emission potential.	469	87.8	60	11.2
K9	Do you care about the future of the world?	494	92.5	37	6.9
K10	Have you participated in any volunteering (Social Responsibility Project) regarding sustainability?	118	22.1	413	77.3

Table 3 represents the attitude levels of students towards the Sustainable Development Goals. Most of the participants responded with “Agree” or “Strongly Agree” to the statements. The highest percentage of students’ “Strongly Agree” responses was the item “Every segment of society should have access to free primary health care.” (36.1%). This result shows that the majority of the participants believe that health services should be free and accessible. Health services are seen as one

of the basic elements of sustainable development. The majority of the participants also agreed with the item "Universities should make sustainable development a national priority in their education processes" (37.6%). When the level of attitudes of students at the University of Malaya towards the SDGs is examined, most of the participants responded with "Agree" or "Strongly Agree" to the statements, which are considered as positive attitudes (27). The highest percentage of students' "Strongly Agree" responses was 56.5% with the statement "Environmental problems are my concern." In this study, the option "All segments of society should have access to free basic health services" has the highest percentage with 36.1%. Student participants drew attention to deficiencies in health services. Nevertheless, participants in both studies generally had a positive attitude towards the SDGs. Parallel results were observed in the studies (35-38).

Table 3: Percentages of Students' Attitudes towards Sustainable Development Goals

	Items	**SD*(%)**	**D*(%)**	**N*(%)**	**A*(%)**	**SA*(%)**
A1	Reducing global poverty and hunger is more important in increasing the economic welfare of developed countries.	101 (18.9)	47 (8.8)	80 (15.0)	172 (32.2)	124 (23.2)
A2	Universities should make sustainable development the primary goal in their education processes.	80 (15.0)	48 (9.0)	72 (13.5)	201 (37.6)	122 (22.8)
A3	I think it is important to raise university students' awareness of the Sustainable Development Goals.	84 (15.7)	45 (8.4)	49 (9.2)	199 (37.3)	142 (26.6)
A4	Men and women should be treated equally in all segments of society.	98 (18.4)	41 (7.7)	47 (8.8)	149 (27.9)	185 (34.6)
A5	The same respect should be shown to people of different origins and cultures.	86 (16.1)	56 (10.5)	58 (10.9)	173 (32.4)	144 (27.0)
A6	Free health care should be available to all people.	92 (17.2)	40 (7.5)	44 (8.2)	149 (27.9)	193 (36.1)
A7	Environmental issues are a concern for me.	79 (14.8)	52 (9.7)	51 (9.6)	193 (36.1)	142 (26.6)
A8	It is important to have knowledge about the Zero Waste Project.	84 (15.7)	42 (7.4)	48 (9.0)	189 (35.4)	152 (28.5)
A9	I think a sustainable lifestyle will change the world.	88 (16.5)	48 (9.0)	55 (10.3)	185 (34.6)	144 (27.0)
A10	Information on Environmental Protection should be included in the courses of every department.	90 (16.9)	53 (9.9)	83 (15.5)	184 (34.5)	110 (20.6)
A11	Sustainability issues should be given more importance in country policies.	83 (15.5)	46 (8.6)	60 (11.2)	185 (34.6)	144 (27.0)
A12	I collect recyclable materials to reduce the amount of garbage.	75 (14.0)	67 (12.5)	89 (16.7)	181 (33.9)	110 (20.6)
A13	I volunteer to participate in projects related to environmental protection.	80 (15.0)	63 (11.8)	105 (19.7)	168 (31.5)	102 (19.1)
A14	I think that university students should be made aware of the Sustainable Development Goals.	81 (15.2)	45 (8.4)	52 (9.7)	200 (37.5)	139 (26.0)
A15	Rising global temperatures have increased water scarcity.	82 (15.4)	49 (9.2)	71 (13.3)	155 (29.0)	154 (28.8)

*SD= Strongly Disagree, *D= Disagree, *N= Undecided, *A= Agree, *SA= Strongly Agree

The SDG implementation criteria of the participating university students are given in Table 3. As seen in Table 4, most of the students used the answer "I agree". The highest percentage of the

agree responses was "I clean up garbage when I see it in a park or natural environment" (35.6%). This result shows that the participants have a high sensitivity to environmental cleanliness. It indicates a conscious mass regarding the protection of natural areas and individual environmental responsibility. After the "I agree" responses, the highest response was "I am undecided". The highest percentage of undecided responses was "I am willing to pay a higher price for ecological products" (31.1%). This result shows that although the participants know that ecological products are environmentally friendly, they cannot make a clear decision about the price difference. This situation shows that economic factors play an important role in sustainable consumption decisions. In the study findings, 31.1% of the students responded "undecided" and 42.7% responded "disagree" to the question of "willingness to pay a high price for ecological products", indicating that economic accessibility is an important factor in transforming sustainability awareness into behavior. This shows that sustainable consumption practices are related not only to individual awareness levels but also to structural and economic conditions. It is seen that the implementation level of the students is generally slightly low (27). It has been found that university students in Selangor, Malaysia, show similar results (39). Students generally have a positive attitude towards sustainability principles (34). However, it is noted that this positive attitude does not always translate into conscious and deep awareness.

Table 4: Percentages of Students Application Levels Regarding Sustainable Development Goals

	Items	**SD*(%)**	**D*(%)**	**N*(%)**	**A*(%)**	**SA*(%)**
P1	Public transportation is my priority over private transportation.	90 (16.9)	96 (18.0)	99 (18.5)	151 (28.3)	68 (12.7)
P2	When I see garbage in green areas, I clean it up.	72 (13.5)	66 (12.4)	93 (17.4)	190 (35.6)	84 (15.7)
P3	I took classes on environmental sustainability.	83 (15.5)	126 (23.6)	110 (20.6)	121 (22.7)	49 (9.2)
P4	I can pay higher prices for environmentally friendly products.	106 (19.9)	122 (22.8)	166 (31.1)	81 (15.2)	34 (6.4)
P5	I do not use animal skin products made from animal skin.	92 (17.2)	62 (11.6)	54 (10.1)	139 (26.0)	151 (28.3)
P6	I avoid using plastic straws in restaurants and cafes.	100 (18.7)	93 (17.4)	139 (26.0)	114 (21.3)	65 (12.2)
P7	When I'm not at home, I turn off all electrical appliances in the house.	71 (13.3)	67 (12.5)	66 (12.4)	153 (28.7)	154 (28.8)
P8	I stay away from snacks and other foods that have a lot of packaging.	86 (16.1)	109 (20.4)	138 (25.8)	105 (19.7)	77 (14.4)
P9	I donate clothes and furniture that I don't use to charities.	74 (13.9)	77 (14.4)	103 (19.3)	153 (28.7)	102 (19.1)
P10	I attend events (e.g. conferences, presentations, workshops) related to environmental sustainability.	87 (16.3)	122 (22.8)	123 (23.0)	119 (22.3)	58 (10.9)
P11	I separate the waste generated at home by grouping it.	83 (15.5)	97 (18.2)	116 (21.7)	135 (25.3)	79 (14.8)
P12	I am open to using green energy.	75 (14.0)	61 (11.4)	106 (19.9)	170 (31.8)	102 (19.1)
P13	I bring my reusable bag with me when I go shopping at the supermarket.	84 (15.7)	92 (17.2)	98 (18.4)	137 (25.7)	100 (18.7)
P14	I am trying to contribute to the Zero Waste Mobilization implemented at our university.	83 (15.5)	66 (12.4)	118 (22.1)	154 (28.8)	85 (15.9)

*SD= Strongly Disagree, *D= Disagree, *N= Undecided, *A= Agree, *SA= Strongly Agree

The correlation between students' knowledge, attitude and application levels is given in Table 5. The reason for preferring Spearman's rho correlation analysis in our study is that the scales used are Likert type and the data are ordinal. In addition, Spearman's rho test, which can measure monotonic (one-way) relationships between ordinal data, was found to be more appropriate instead of parametric correlation tests because the variables do not show normal distribution. This test also increases the reliability of the analysis by being less affected by outliers. Spearman's rho test was used to measure monotonic (one-way) relationships between ordinal data because the scales used are Likert type, the data are ordinal and the variables do not show normal distribution. There is a weak negative correlation between students' knowledge and application level ($r = -.188$, $N = 534$, $p < .001$) (Table 4). This shows that although university students have high knowledge about SDGs, their application level is low. On the other hand, there is a significant and very strong positive correlation between students' attitude and application level towards SDGs ($r = .730$, $n = 534$, $p < .001$) (Table 5). This shows that a positive attitude towards SDGs will encourage students to implement at a good level. There is a weak negative correlation between students' knowledge and Attitude levels ($r = -.149$, $N = 534$, $p < .001$) (Table 5). This shows that although university students have high knowledge about SDGs, their attitude level is low. It aims to assess the knowledge, attitude and practice levels of Sharjah University students towards sustainability efforts carried out by their university. It shows that students have basic knowledge about sustainability efforts and have a positive attitude towards it (40). In this context, the Theory of Planned Behavior (TPB) states that an individual's intention to behave is determined by attitude, perceived behavioral control, and subjective norms (41). Therefore, if an individual has high knowledge about sustainability, it may not turn into practice if there is no social support, intrinsic motivation, or sense of competence to transform this knowledge into behavior. Similarly, the Knowledge-Attitude-Behavior Model (KAB) argues that in order for an individual to develop behavior, not only knowledge is required, but this knowledge must be transformed into positive attitudes (42). The fact that the correlation between knowledge and attitude in our study was also weak ($r = -0.149$, $p < 0.001$) indicates that this transformation has not occurred sufficiently. These results are consistent with the findings in similar studies (27, 34). In both studies, it was stated that although students had knowledge about sustainability, they had difficulty transferring this knowledge to daily life practices. In this context, it is suggested that in order for students to undergo behavioral transformation, not only their knowledge levels should be increased but also this knowledge should be internalized through participatory, applied and experiential learning methods. To understand the knowledge, attitude and behavior of university students consisting of 567 students studying humanities, agriculture or engineering at public universities in Iran towards sustainable development. Positive correlations were determined between knowledge, attitude and behavior towards sustainable development (43). It addressed the perceptions, attitudes and behaviors of students studying at the National University of Science and Technology in Pakistan towards sustainability. It shows that students' attitudes and knowledge about sustainability affect their sustainable behaviors. This study recommends that the government encourages the participation and involvement of young people in the design and implementation of sustainable environmental policies (44).

Table 5: Correlation between Knowledge, Attitude and Practice

Correlation between	N	Spearman's rho correlation coefficient	Inference
Information Application	534	-,188 **	related
Attitude Application	534	,730 **	related
Knowledge Attitude	534	-,149 **	related

**. Correlation is significant at the 0.01 level (2-tailed)

The fact that university students are informed about SDGs but lack knowledge about their implementation can be attributed to various individual, institutional and social factors. The

education provided at universities generally remains theoretical; students learn 17 topics in class but are not sufficiently informed about how to apply these topics to daily life. The lack of sustainability-themed projects at universities for implementation, insufficient promotion of volunteer work or the lack of sustainable practices (recycling, energy efficiency, public transportation etc.) on campus make it difficult for students to take steps in this direction. Acquiring knowledge is not enough to turn it into behavior. The basis of this situation is that education remains theoretical, limited opportunities for implementation, lack of personal motivation and inadequate systematic support. A more holistic, participatory and experiential approach is required for the implementation of sustainable development goals among students. Universities should support this process more actively in terms of both content and implementation opportunities.

Conclusion

In the current era, universities are at the forefront of institutions that will produce solutions to social problems and environmental damage. Raising awareness among new generations, conducting research that will support sustainable development, and designing and implementing all activities within the framework of the Sustainable Development Goals are fundamental issues that should be on the agenda of today's universities. However, universities have more responsibility in adopting and disseminating the concept of sustainable development due to their critical power in influencing the attitudes and behaviors of new generations and their role in guiding society. This study, prepared within this framework, aims to examine the performance of universities in Türkiye in order to achieve the Sustainable Development Goals, and bases this examination on international university evaluation indexes. After Türkiye put the Paris Agreement into effect on October 7, 2021 and announced its net zero emission target in 2053, it is anticipated that universities will find more support, take on more responsibility, play a more active role, and contribute more to this transformation and sustainable development on an international scale. In this context, the establishment of normative frameworks by all competent authorities, especially the Higher Education Institution, which is the determinant of the activities of universities in our country, will also increase the impact of universities. The increase in applications made worldwide to the indexes mentioned in this study shows the increasing interest and responsibility of universities towards the 2030 Sustainable Development Goals. In addition, it can be said that the European Green Deal has made universities in Europe even more active in this direction. In addition to education and research activities, the sustainability-related studies of universities that lead the region and society they are located in are of utmost importance. Universities, whose people they educate find a place at every level of society, play a key role in the spread of sustainable development with their sustainability education and activities. Universities have the opportunity to make a significant contribution to society as a result of educating people on sustainability and their guiding studies on sustainability. Accordingly, it is important for universities to conduct sustainability activities and report them. However, it is observed that these non-profit organizations lag behind many businesses in terms of sustainability. As a result of the studies conducted, it is observed that the sustainability studies of universities in many countries of the world are not sufficient due to different reasons. It has been observed that universities in Turkey are also in the beginning and development stages in this regard. South African adults were surveyed to identify their knowledge and attitudes towards the SDGs. The results revealed that women were more likely than men to have received education about the SDGs, and that younger people were more likely than older people to claim to have sufficient knowledge about the SDGs. They also revealed that those with a high school education were more likely to have not received education about the SDGs, while those with a master's degree claimed to have received education about the SDGs. Interestingly, half of the PhD graduates reported that they had not received education about the SDGs, indicating that higher levels of education do not necessarily mean better knowledge about the SDGs (45). A Caycuma campus student towards SDGs is high, which is evidenced by a significant number of students with high knowledge and a positive attitude. However, they showed slightly low performance in implementing SDGs. There is a weak negative correlation between student

knowledge and implementation level. It shows that although campus students have high knowledge about SDGs, their implementation level is slightly lower, but this can be increased with the strategic approaches and intervention programs of the university administration. However, there is a strong positive correlation between student attitude and implementation level. This shows that by having a positive attitude, students will be more motivated to implement actions that are in line with SDGs.

In conclusion, all studies show that higher education students have a certain awareness and positive attitude towards sustainability, but universities need to develop more effective strategies to transform this attitude into behavior. The education system needs to be addressed with a more holistic approach in order to increase students' knowledge levels, strengthen their motivation and enable them to implement sustainability principles. In creating sustainable societies, the role of higher education institutions in this field should be strengthened and supported by taking into account the need for individuals in society to have adequate knowledge, skills and attitudes. Workshops and seminars on environmental issues such as environmental health, environmental degradation and global warming should be held to create more awareness. In addition, social responsibility projects that students can carry out in partnership with internal and external stakeholders should be encouraged. Within the scope of the "Sustainable and Climate-Friendly Campus Project" launched in 2022 under the coordination of the Council of Higher Education (YÖK) and the Ministry of Environment, Urbanization and Climate Change, 11 state universities were selected as pilots and various sustainability practices were implemented at these institutions. This development concretely demonstrates that institutional awareness and capacity to take action regarding SDGs have increased in universities in Turkey. In addition, many universities from Turkey are evaluated with their sustainability performances in the Times Higher Education (THE) Impact Rankings; most of these institutions play an active role especially in SDG 4 (Quality Education), SDG 13 (Climate Action) and SDG 17 (Partnerships for the Goals). Visibility in these rankings shows that universities adopt an integrated approach to SDGs both in their strategic plans and in their research and education activities (9). As of 2024, 120 universities from Turkey have participated in the UI Green Metric World University Rankings. This number represents a significant increase compared to previous years and is considered a concrete indicator of the interest shown by higher education institutions in Turkey in sustainability. In 2010, only 95 universities were included in this global ranking, while in 2024, a total of 1,477 universities were listed, making Turkey one of the notable countries in terms of participation. This increase shows that universities in Turkey have taken important steps towards systematizing sustainability-based practices. The fact that universities create strategic plans for the SDGs, establish sustainability offices, implement green campus projects and actively participate in international rankings are among the concrete indicators that strengthen this interest.

In conclusion, while this study demonstrates the increasing interest of our universities in sustainable development, it also aims to increase the interest of our universities, both those evaluated by rating agencies and those that have not yet taken action in this area. As a suggestion; courses on sustainability, sustainable development and environment can be included at every level of education and training. Sustainability, sustainable development and environment issues can be given more place in the curriculum and more gains can be found. Due to the lack of research on sustainability, sustainable development and education for sustainable development, there is not enough data on these issues. Increasing the number of studies is very important in terms of giving students an idea about their perspective on sustainable development goals.

Abbreviations

BEUN: Zonguldak Bülent Ecevit University, MDGs: Millennium Development Goals, SDG: Sustainable Development Goals, UN: United Nations, UNDP: The United Nations Development Program.

Acknowledgement

None.

Author Contributions

All authors contributed equally to all work on the article.

Conflict of Interest

The authors declare that they have no conflict of interest that could have appeared to influence the work reported in this paper.

Ethics Approval

This study was conducted following ethical standards, with approval and consent obtained from all individual participants included in the study.

Funding

Not applicable.

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