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Encouraging Environmental Sustainability in University Campuses: Evidence from Türkiye[1]

Erkin Sarı[*]
Bengi Öner-Özkan[**]

[*] *Dr. Research Assistant | Arş. Gör. Dr.*
Selcuk University, Faculty of Letters, Department of Psychology | Selçuk Üniversitesi, Edebiyat Fakültesi, Psikoloji Bölümü
erkin.sari@yahoo.com.tr
Konya / TÜRKİYE

[**] *Prof. | Prof. Dr.*
Middle East Technical University, Faculty of Science and Literature, Psychology Department | Orta Doğu Teknik Üniversitesi, Fen Edebiyat Fakültesi, Psikoloji Bölümü
bengi@metu.edu.tr
Ankara / TÜRKİYE

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Abstract

The primary aim of the current study is to comprehend the development and evolution of environmental attitudes and to examine on-campus pro-environmental engagement among 16 undergraduates from two public Turkish universities through semi-structured interviews. Our qualitative analysis highlighted that several factors (e.g., the existence of environmentally aware role models in elementary education) are responsible for the formation of respondents' environmental attitudes. The current paper also points out that litter pollution is a major problem on university campuses. To combat this problem, most respondents in the study reported taking proactive measures (e.g., disposing of the waste properly) to reduce littering and promote sustainable practices. In addition to fighting against littering, they actively take part in pro-environmental activities (e.g., tree plantation), prefer ecologically friendly mobility options (e.g., biking, using shuttles), financially support ecological organizations and attending their activities, and conserve energy. They also reported several factors for motivating (e.g., the willingness to protect the campus ecosystem) and hindering (e.g., lack of time) their on-campus pro-environmental engagement. Furthermore, our respondents pointed out that all stakeholders (e.g., rectorate, employees, students) regarding campus sustainability should take part (e.g., using effective measures for rewarding and penalizing) in amplifying the effectiveness of on-campus pro-environmental behaviors. With these findings, the current paper made important theoretical and practical contributions to campus sustainability.

Keywords: Campus sustainability, pro-environmental behaviors, environmental attitudes, motivators of pro-environmental behaviors, barriers to pro-environmental behaviors.

Üniversite Kampüslerinde Çevresel Sürdürülebilirliğin Teşvik Edilmesi: Türkiye'den Bulgular[2]

Öz

Bu çalışmanın temel amacı, yarı yapılandırılmış görüşmeler yoluyla Türkiye'deki iki devlet üniversitesinde öğrenim gören 16 lisans öğrencisinin çevreye dair tutumlarının gelişimini ve

[1] This study is part of the first author's PhD dissertation. A part of this study was presented as an oral presentation at *Symposium on Environmental and Climate Change Studies in Psychology*.

[2] Bu çalışma ilk yazarın doktora tezinin bir parçasıdır. Bu çalışmanın bir kısmı Psikolojide Çevre ve İklim Değişikliği Çalışmaları Sempozyumu'nda sözlü bildiri olarak sunulmuştur.

değişimini anlamak ve kampüs içi çevreci davranışlarını incelemektir. Bulgularımız katılımcıların çevreye dair tutumlarının oluşumunda bir dizi faktörün (ör., ilköğretimde çevreye duyarlı rol modellerin varlığı) etkili olduğunu vurgulamıştır. Mevcut çalışma ayrıca çöp kirliliğinin üniversite kampüslerinde önemli bir sorun olduğuna işaret etmektedir. Bu sorunla mücadele adına, çalışmadaki katılımcıların çoğu çöp kirliliğini azaltmak ve sürdürülebilir uygulamaları teşvik etmek için proaktif önlemler aldıklarını (ör., atık ayrıştırma) ifade etmiştir. Katılımcılar çöp kirliliğiyle mücadele etmenin yanı sıra, çevreci faaliyetlere (ör., ağaç dikme) aktif olarak katılmakta, çevre dostu ulaşım seçeneklerini (ör., bisiklete binme, servis kullanma) tercih etmekte, çevreci kuruluşları finansal olarak desteklemekte ve faaliyetlerine katılmakta ve enerji tasarrufu yapmaktadırlar. Çalışmaya katılanlar ayrıca kampüs içi çevreci davranışlarını teşvik eden (ör., kampüs ekosistemini koruma isteği) ve engelleyen (ör., zaman yetersizliği) çeşitli faktörleri belirtmiştir. Ayrıca, katılımcılarımız kampüs sürdürülebilirliği ile ilişkili tüm paydaşların (ör., rektörlük, çalışanlar, öğrenciler) kampüs içi çevreci davranışların etkinliğini arttırmada rol alması (ör., ödüllendirme ve cezalandırma için etkili önlemler kullanmak) gerektiğini belirtmiştir. Bu bulgularla mevcut çalışma kampüs sürdürülebilirliğine önemli teorik ve pratik katkılarda bulunmaktadır.

Anahtar Kelimeler: Kampüs sürdürülebilirliği, çevreci davranışlar, çevreye dair tutumlar, çevreci davranışların teşvik edicileri, çevreci davranışların engelleyicileri.

INTRODUCTION

There is a growing concern that human-induced climate crisis as well as ecological degradation pose a serious threat to all living things, including human and non-human species. Relevant literature (e.g., Intergovernmental Panel on Climate Change [IPCC], 2022) demonstrated that over 3.5 billion people and a vast majority of non-human entities are under threat. The cited report of IPCC (2022) also indicated that an increase in industrial activities disregarding the ecological balance and the adoption of environmentally unsustainable behavioral practices by individuals are two main factors behind the climate crisis and ecological degradation. Previous research also highlighted the negative impact of climate change on physiological (see McMichael & Lindgren 2011 for a review) and psychological health (see Cianconi et al., 2020 for a review). Considering its negative effects on the well-being of nature and individuals, encouraging environmentally friendly behavioral practices in various environments (e.g., home, workplace, educational settings) is probably one of the most vital goals of humanity. In the present study, our main aim is to examine pro-environmental engagement in university campuses among undergraduates studying at two public Turkish universities, namely Middle East Technical University and Selçuk University.

Pro-Environmental Behaviors

All humans have an important responsibility to mitigate climate change since it poses a huge risk to the lives of all living beings. Switching to environmentally sustainable lifestyles and embracing eco-friendly practices are crucial steps towards creating a sustainable world. So, performing "behaviors that harm the environment as little as possible, or even benefits the environment" is essential (Steg & Vlek, 2009, p. 309). Also labeled as pro-environmental behaviors, promoting these actions, including recycling, energy conservation, and environmental activism exhibited in residents, work environments, educational institutions, and public spaces have a primary role in building an environmentally sustainable world (Lange & Dewitte, 2019). To encourage pro-environmental behaviors, it is necessary to identify the factors that motivate individuals to act in an environmentally friendly manner and those that hinder such actions.

Prior academic work on individuals' pro-environmental engagement pointed out several factors that motivate and hinder individuals' pro-environmental engagement (Blankenberg & Alhusen, 2019). While prioritizing self-transcendence (i.e., universalism and benevolence) and biospheric values (Steg et al., 2005), being open to new experiences in life and aggregableness personality type (Soutter et al., 2020), defining oneself with a specific reference to a social group (Fritsche et al., 2018) or a particular place (Ramkissoon et al., 2012) promote pro-environmental behaviors; lack of time (Blake, 1999), perceiving the behavior as difficult to exhibit (Fu et al., 2018), and the deficiency of internal (e.g., not to feel responsible about ecological problems) or external (e.g., social norms encouraging sustainability) sources of motivation to act sustainably (Kollmuss & Agyeman, 2002) are some obstacles that hinder pro-environmental behaviors.

On-Campus Pro-Environmental Behaviors

Individuals perform various behaviors for the sake of the environment at different scales (i.e., house, workplace, public sphere), and there is a vast body of literature on pro-environmental behavior in domestic settings (Huber et al., 2018; Netuveli & Watts, 2020), workplaces (Robertson & Barling, 2013; Yuriev et al., 2018), and tourist destinations (Lee et al., 2013; Miao & Wei, 2013). However, there is a dearth of research on pro-environmental behavior in educational settings, such as schools and university campuses. Similar to other public or private institutions (e.g., hospitals, factories) the high energy consumption and waste production of universities have a negative impact on the natural environment, whether directly or indirectly. However, it should be noted that universities can also

contribute to solving environmental issues. Specifically, they have the potential to actively participate in reducing energy consumption (Oyedepo et al., 2021), implementing proper waste management practices (Tu et al., 2015), and promoting sustainable transportation options such as in-campus shuttles for their members (Keat et al., 2016). In addition, universities, as significant producers of knowledge, have the potential to develop effective techniques to mitigate the adverse impacts of climate change. By collaborating with other institutions such as municipalities and ministries, the implementation of sustainable technology production methods can be made more feasible.

Considering their numbers and their potential effect on society and the world, undergraduates are undoubtedly the most significant group within the university (Zamora-Polo et al., 2019). Hence, comprehending their attitudes towards the natural environment and their pro-environmental engagement in campuses is crucial both for building more sustainable campuses as well as creating more environmentally aware generations. However, there exists a scarcity of research pertaining to pro-environmental behavior on university campuses. Besides, prior academic work examining on-campus pro-environmental engagement of university students mostly focused on undergraduates' waste management practices (e.g., recycling, and waste separation) (Chao et al., 2023; Cho, 2019; Largo-Wright et al., 2012; Moqbel et al., 2020) or their environmentally friendly behaviors in specific settings (e.g., dormitories) of campus (Mokrzecka & Nowak, 2019; Thondlana & Hlatshwayo, 2018; Wilkinson & Zalejska Jonsson, 2021). For example, in Cho's (2019) paper, findings suggested that positive attitudes towards recycling, perceived control, negative anticipated emotions, and self-determined motivation lead to on-campus recycling intentions. Moreover, recycling intention and self-determined motivation were identified as determinants of college students' actual participation in campus recycling efforts. In another study, Chao and colleagues (2023) demonstrated that intrinsic motivation, interpersonal altruism, and place attachment positively predicted undergraduates' recycling behavior. Having knowledge about environmental issues (e.g., Baba-Nalikant et al., 2023; Levy & Marans, 2012; Liao & Li, 2019; Qu et al., 2023), environmental concern (e.g., Chao et al., 2023; Hamilton & Rane, 2022; Qu et al., 2023), the existence of subjective norms regarding ecological conservation (e.g., Liao & Li, 2019), moral obligation (e.g., Largo-Wright et al., 2012), membership in ecological organizations (e.g., Helferty & Clarke, 2009), the inclusion of environmental issues to lectures (e.g., Pizmony-Levy & Michel, 2018), and prioritizing biospheric values (e.g., Hamilton & Rane, 2022) are the other predictors of on-campus pro-environmental behaviors.

Making university campuses more sustainable and promoting environmentally friendly practices on university campuses have become an important goal of the authorities (e.g., rectorate) around the world. As an example, UI GreenMetric (n. d.) collected data from 1050 universities from 85 countries in 2022 and it measures the sustainability and environmental performance of universities based on several criteria, including managing waste in a proper way, promoting sustainable mobility options, and increasing the proportion of green areas in campuses. Among these 1050 universities, while Middle East Technical University ranked 135th, Selçuk University ranked 431st. There is only one university from Türkiye in the top 50, namely İstanbul Technical University with its 47th rank. So, there is an urgent need to increase policies to protect the environment and raise environmental awareness in universities in Türkiye. To respond to this need, Turkish universities use a variety of strategies. Implementing effective waste management practices (e.g., recycling, composting), using appropriate technologies (e.g., renewable energy) in order to ensure energy efficiency, promoting sustainable modes of transportation by building bike lanes and offering free shuttles to their members, increasing the number of restorative environments (e.g., green spaces) are some examples of sustainable campus efforts (see Boğaziçi University, 2023; İstanbul Technical University, 2022; Middle East Technical University, n. d.). In addition to implementing these policies, some universities also strive to increase environmental awareness through education. To be particular, Middle East Technical University (Yeşil Kampüs

Topluluğu, n.d.) and İstanbul Technical University (n.d.) offer several courses (e.g., Renewable Energy Systems, Nature and Human Use) related to sustainability to its students.

The Current Study

Universities have a huge potential for mitigating climate change by adopting sustainable policies and producing scientific knowledge. In addition, the feasibility of adopting sustainable technologies can be enhanced through collaboration with other institutions, including municipalities and ministries. Nevertheless, a limited number of papers have dealt with the possible predictors and the consequences of environmentally sustainable actions on university campuses. In addition, these limited number of studies mostly focused on waste management practices of university students. So, a more comprehensive study of undergraduates' on-campus pro-environmental practices is needed. Besides, this small number of studies have utilized data from WEIRD (i.e., White, Educated, Industrialized, Rich, and Democratic) samples (Tam & Milfont, 2020). To our knowledge, there is no study investigating on-campus pro-environmental behaviors in the Turkish context. Considering Türkiye is one of the countries that are most affected by negative consequences of climate change and ecological degradation (Intergovernmental Panel on Climate Change, 2023) and its increasing human population (Republic of Türkiye Ministry of Environment and Urbanization, 2021), the importance of promoting environmental sustainability is becoming more apparent. Moreover, there are nearly 7 million university students in Türkiye (Yükseköğretim Kurulu, 2023) and due to their energy consumption, waste generation, and transportation requirements, university campuses leave a substantial environmental footprint. Besides, campuses exert substantial resource consumption, encompassing energy, water, and material usage on a significant scale. For these reasons, the current paper's primary goal was to navigate pro-environmental engagement in two Turkish university campuses among Turkish-speaking undergraduate students. These students' attitudes towards the natural environment, behaviors that they perform for the sake of the environment (i.e., pro-environmental behaviors), and the factors that encourage and constrain their pro-environmental behaviors were examined through semi-structured interviews. With these aims in mind, the current qualitative study sought to answer following questions:

- Which variables influence the environmental attitudes of university students?
- Do their current attitudes towards the environment differ from their attitudes 5 years ago?
- What do they think about the current environmental conditions of their campuses?
- What actions do they take to protect the environment on the campus?
- What motivates or hinders their on-campus pro-environmental behavior?
- In which situations do they think these pro-environmental behaviors may be more effective?

Method

Participants and Procedure

Upon receiving ethical approval from the ethics committee of Middle East Technical University (Protocol Number: 272-ODTU-2020), we conducted 16 semi-structured interviews (see Appendix for interview questions) with undergraduates (9 females and 7 males) from two public Turkish universities through purposive sampling. Participants were invited to the study through the social media groups of the universities. Since the main purpose of our study was to understand on-campus pro-environmental engagement and considering the limited campus experience of 1st-year students, only 2nd, 3rd, and 4th-year students participated in the study (see Table 1 for demographic information about participants). Since the data of the study was obtained during the pandemic period, all interviews were conducted by

the first author online, and all of these interviews except two[3] were recorded auditorily and visually. Then, a verbatim transcription method was used to transcribe this data into text. The interviews had an average duration of 23 minutes.

Table 1

Demographic Information About Participants

Participant Number	University	Department	Level of Education
1*	Selçuk University	Civil Engineering	4th-year undergraduate
2*	Selçuk University	Sociology	4th-year undergraduate
3	Selçuk University	Sociology	2nd-year undergraduate
4	Selçuk University	International Relations	3rd-year undergraduate
5*	Selçuk University	Health Management	3rd-year undergraduate
6	Selçuk University	Sociology	4th-year undergraduate
7*	Selçuk University	Nutrition and Dietetics	3rd-year undergraduate
8	Middle East Technical University	Economics	2nd-year undergraduate
9	Middle East Technical University	Industrial Engineering	4th-year undergraduate
10	Middle East Technical University	Computer Engineering	2nd-year undergraduate
11	Middle East Technical University	Mechanical Engineering	4th-year undergraduate
12	Middle East Technical University	Geological Engineering	3rd-year undergraduate

[3] They did not accept their interviews to be recorded. Every statement made by these two participants during the interview was noted verbatim.

13	Middle East Technical University	Industrial Engineering	2nd-year undergraduate
14	Middle East Technical University	Metallurgical and Materials Engineering	2nd-year undergraduate
15*	Middle East Technical University	City and Regional Planning	3rd-year undergraduate
16	Middle East Technical University	English Language Education	4th-year undergraduate

Note. Participants with * are members of an environmental student organization.

Analysis

To analyze the qualitative data obtained from the interviews, thematic analysis was used since it offers a comprehensive, elaborate, and straightforward representation of the data (Braun & Clarke, 2006). An inductive (i.e., data-based) approach was followed in the creation of themes, and words were used as the unit of analysis in coding. In accordance with Braun and Clarke's (2006) approach, the first author transcribed all data verbatim and subsequently engaged in iterative readings and re-readings of the data. Additionally, the data were sent to two other researchers, and they became familiar with the data by reading all transcripts multiple times and they coded the data. In other words, the data coding process was done independently. In order to gain a more diverse range of perspectives and a comprehensive understanding of the data, a Zoom meeting was conducted with them. In the meeting, these independent codings were compared in order to finalize the coding form. Upon finalizing the coding scheme, we further classified the codes into subthemes that comprised the overarching themes. We reached a consensus on the coding scheme, with only minor and inconsequential differences between our interpretations.

The data coding process was done by three researchers, including the first author of this paper and two other researchers. The main reason behind this decision is to bolster the trustworthiness and credibility of a study. The method employed to analyze the data of this work was similar to peer debriefing (Janesick, 2015). Peer debriefing in qualitative research involves researchers engaging in discussions with knowledgeable peers in the field of qualitative research. The primary objective of peer debriefing is to bolster the rigor and dependability of research findings by soliciting external input, exploring alternative perspectives, and engaging in critical reflections on the research process and interpretations. Similarly, in the current study, the assigned peer researchers evaluated study transcripts to identify potential instances where the primary researcher may have overlooked important aspects. As also suggested by Spall (1998) and Janesick (2011), engaging in this process aids in fortifying the credibility, validity, and trustworthiness of their findings by mitigating the influence of biases, by inviting the perspectives of others.

Results

All interviewees were requested to share their on-campus pro-environmental engagement (e.g., types of pro-environmental behaviors, and encouraging and discouraging factors for pro-environmental engagement). The first part of this section will focus on the formation of respondents' attitudes towards the natural environment and any changes that have occurred in their environmental attitudes over the past five years will be highlighted. The subsequent subsection's primary aim is to provide participants' opinions regarding the conditions of their university campuses. Finally, it will be

provided an overview of the participants' environmentally friendly behaviors on campus, along with the factors that facilitate or hinder such behaviors.

Formation and Transformation of Attitudes Towards the Natural Environment

The thematic analysis highlighted that a number of factors, including parents, living/growing up in urban/rural areas, witnessing the negative consequences of climate change and environmental degradation, environmentally aware role models (e.g., teachers) in elementary education, a social environment where easily interacting with environmentally friendly others (e.g., friends), and personal expectations are responsible in the formation of respondents' environmental attitudes. Additionally, most of the participants stated that they are more concerned about environmental issues, as compared to five years ago (see Table 2). Transitioning to higher education from secondary education is an important step, especially considering this age range is influential in future decisions (e.g., about work, marriage) of individuals. In addition, undergraduates have an opportunity to benefit from university in terms of academic and social development, socializing with their peers from various backgrounds, etc. Besides, prior studies (e.g., Rume & Islam, 2020) have shown that the COVID-19 outbreak has increased environmental awareness among individuals. For these reasons, an additional question regarding the changes (if any) in their environmental attitudes in the last five years was asked and the findings in this section are presented under two titles as *Primary Factors that Form Respondents' Environmental Attitudes* and *Primary Factors that Transform Respondents' Environmental Attitudes in the Last Five Years*.

Individuals in the family (e.g., parents) have an important source of environmental concern. In particular, thematic analysis demonstrated that there was variation among the students in terms of their parents' environmental concern; some reported that their parents showed little interest in environmental issues, while others stated that their family members felt a sense of responsibility toward protecting the natural environment. The analysis also highlighted that observing the detrimental effects of ecological degradation is a crucial factor that influences the perspectives of undergraduates on the natural environment. The participants noted that human-made climate crisis and ecological damage have heightened their environmental awareness and deepened their concern for future generations. Thinking of the formation of environmental attitudes without the context of growing up/settling in is incomplete. In line with this, respondents stated that their higher levels of environmental concern stem from growing up/living in places where they easily interact with nature. Environmentally aware role models (e.g., teachers) in elementary education, a social environment where easily interacting with environmentally friendly others (e.g., friends), and personal expectations are also responsible for the formation of respondents' environmental attitudes. Almost all participants stated that they are more concerned about environmental issues, as compared to five years ago. Being a university student (e.g., being a member of an environmental student society, attending a university that promotes environmental awareness, becoming a grown-up), observing - directly or through media - the adverse impacts of the climate crisis and ecological damage, and experiencing discomfort with the environmentally unfriendly lifestyles of other individuals were revealed as influential factors that transform participants' environmental attitudes for the better (also see Table 2).

Table 2

Formation and Transformation of Attitudes Toward Nature

Primary Factors that Form Respondents' Environmental Attitudes	**Sample Quotations from Interviews**
Influence of Family Members	"The reason I like green is my uncle, definitely. My uncle likes to explore new places and to spend time in the forest. Either by narrating or taking us to a natural place, he has shown us the peace in nature."
Living or Growing Up in Rural Areas	"I live in a rural area, and I think I'm lucky. We are constantly in contact with nature here and I respect the nature."
Witnessing the Negative Consequences of Ecological Degradation	"My perspective on the environment is shaped by climate change. I think we should do our part even if we cannot make an important effect on its negative consequences."
The Existence of Environmentally Aware Role Models in Elementary Education	"My views on the environment were shaped by my teachers and principals at school."
To Have Environmentally Aware Friends	"My friends have a great influence (on my attitudes towards the environment)."
Personal Motives	"When I was a child, I warned a friend of mine because she was littering. And then another friend of mine appreciated what I did."
Primary Factors that Transform Respondents' Environmental Attitudes in the Last Five Years	**Sample Quotations from Interviews**
Being a University Student	
Engaging in Student Communities for Environmental Protection	"Earlier to begin my higher education, I was not a member of TEMA[4]. My environmental concern is a bit higher now, because I have been a TEMA volunteer for a year."
Attending a University that Promotes Environmental Awareness	"When I came to a more natural place like Middle East Technical University campus where we should pay more attention to the environment, I realized that we need to protect the environment.

[4] The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats.

	Middle East Technical University culture has a great influence on my environmental awareness."
Becoming a Grown-Up	"I made a home on my own and I try to maintain my own life. I take care not to waste for financial purposes and I have better understood that how waste also harms to environment."
Observing the Adverse Impacts of the Climate Crisis and Ecological Damage	"I have been watching environmentally related documentaries for about 5 years and I am getting more conscious as I see how the environment has been destroyed and animals disappeared."
Experiencing Discomfort with the Environmentally Unfriendly Lifestyles of Other Individuals	"Earlier, I was not paying much attention to what was happening around me. Then I started to look around more carefully and I saw that people litter without concern for the environment. I realized that something had to be done and I started to pay more attention to environmental issues. My awareness of the environment may be due to the pollution I see."

Opinions Regarding the University Campuses

All interviewees were requested to share their opinions regarding the general and environmental conditions of their campuses. In particular, they were asked about what they liked and disliked about their campuses. Besides, they shared their ideas on the current and future environmental conditions of their campuses. The interviewees also inquired about the duties of university officials (e.g., rectorate), students, and staff in enhancing the environmental conditions on their campus.

One notable feature of Middle East Technical University is that all of its educational and housing facilities are located in the same place, creating a strong sense of community and belonging among its students. Besides, Middle East Technical University students believe that their campus has a relatively liberal environment that allows freedom of expression. Another positive side of Middle East Technical University is its vast wooded area provides a peaceful and rejuvenating environment for the students. Nevertheless, Middle East Technical University students believed that on-campus transportation is sometimes difficult, especially for undergraduates living in remote areas of the campus. Lack of maintenance and the aggression of stray dogs are the other aspects of the campus that students do not like. Similar to Middle East Technical University students, undergraduates in Selçuk University appreciate the convenience of having all buildings in one location, and the presence of a large green area on the campus creates a comfortable atmosphere. Conversely, they reported that their campus is well-maintained, and the cleaning staff is highly dedicated. Additionally, the existence of trams in-campus makes transportation easier. However, the fact that Selçuk University's hospital is on the campus and there is no restriction for non-members regarding entering the campus area. This has a detrimental impact on campus attachment and university identification, as they reported.

In terms of on-campus environmental conditions, both campuses are valued by students. Nevertheless, they pointed out that most students do not appreciate that. Most respondents also expressed concern that the environmental condition of their campuses will deteriorate over the next 25

years (see also Gifford et al., 2009). They also pointed out that the growing campus population will lead to the construction of new buildings, resulting in the removal of green spaces. Hence, they anticipated that their campuses will become less green and more concrete in the future. Furthermore, the participants expressed concern that environmental awareness will decline over the next 25 years. The decline in the quality of higher education may lead to a decrease in ecological awareness among students. Besides, undergraduates from Middle East Technical University were worried that their campus may become accessible for non-members (i.e., public) and this probably makes it a picnic area. Contrary to these pessimistic ones, some students hold a positive outlook for the future. They express optimism that progress in technology will lead to improved conditions on their campus. In addition to those views, some suggest that the future state of the environment on their campus will be influenced by prospective students and future authorities. Lastly, the majority of our respondents highlighted that they - as undergraduates - should bear a higher responsibility than officials regarding in-campus environmental conditions. In particular, they highlighted that university officials could provide support to students and student organizations in their efforts to improve the environmental situation on campus. Additionally, they suggested that the authorities could arrange activities such as tree planting and seminars that raise awareness on ecological issues in order to build a sustainable campus.

On-Campus Pro-Environmental Engagement: Motivators and Barriers

Participants reported that they exhibit several actions (e.g., reducing waste and littering, and engaging in environmental organizations) for the conservation of the campus environment. Besides, some factors influence their protection motivation negatively (e.g., lack of time) or positively (e.g., the willingness to protect the campus ecosystem) (see also Table 3).

Our analysis highlighted that litter pollution is the major problem on two campuses. To combat this problem, the majority of respondents in the study reported taking proactive measures to reduce littering and promote sustainable practices. Particularly, they consciously try to avoid littering and dispose of their waste properly and pick up others' waste. Besides, some of them stated that they educate their friends and acquaintances about the importance of reducing litter and recycling. In addition to fighting against littering, some respondents also reported that they actively take part in pro-environmental activities (e.g., tree plantation), prefer ecologically friendly mobility options (e.g., biking, using shuttles), financially support ecological organizations and attending their activities, and energy conservation.

The sources of motivation and hindering factors to on-campus sustainability are other questions that this study seeks to answer. While discomfort with others' lack of concern for the environment and the willingness to protect the campus ecosystem stand out as two main motivating factors, respondents reported that the lack of time, perceiving sustainable actions as difficult to perform, and receiving negative feedback from peers were found to discourage participants' pro-environmental engagement.

Respondents also pointed out that all stakeholders (e.g., rectorate, employees, students) regarding campus sustainability should take part in amplifying the effectiveness of in-campus sustainable behaviors. In particular, depicting the impacts of climate change and ecological damage with images and videos, performing pro-environmental behaviors collectively, organizing more pro-environmental activities, being a positive example for others, and using effective measures for rewarding and penalizing may help to increase the strength of undergraduates' pro-environmental effort (also see Table 3).

Table 3

On-Campus Pro-Environmental Engagement

Types of Pro-Environmental Behaviors	
Reducing Pollution	
Avoiding Littering	
Picking Up Others' Waste	
Warning Others About the Importance of Reducing Litter	
Taking Part in Pro-Environmental Activities	
Preferring Ecologically Friendly Mobility Options	
Financially Support Ecological Organizations	
The Sources of Motivation for On-Campus Pro-Environmental Engagement	**Sample Quotations from Interviews**
Discomfort with Others' Lack of Concern for the Environment	"Others' thoughtlessness motivates me. I feel like I did something useful. I like this feeling."
The Willingness to Protect the Campus Ecosystem	"I spend at least 20 hours a day on campus, sometimes I don't leave the campus for weeks. I don't want this environment that I am always in to be dirty, that is where I live."
Barriers to On-Campus Sustainability	**Sample Quotations from Interviews**
Lack of Time	"Time plays a constraint role. I never litter, but I am not able to pick up every trash I see."
Perceiving Sustainable Actions as Difficult to Perform	"It is hard."
Receiving Negative Feedback from Peers	"I heard from someone that "do you think that you can change the world when you pick up litter?". These (feedbacks) affect me negatively."

Factors that Amplify the Effectiveness of On-Campus Sustainable Behaviors	**Sample Quotations from Interviews**
Visualizing the Impacts of Ecological Damage	"It might be better if we show the concrete consequence of pro-environmental behavior, because people are more sensitive to the tangible reality. For example, it will be more effective if the effects of these behaviors are demonstrated through theater."
Performing Pro-Environmental Behaviors Collectively	"It is not very effective when we exhibit these behaviors individually, but I think it will be effective if we do collectively, then we may create awareness."
Organizing more Pro-environmental Activities	"Student organizations may increase environmental awareness through activities."
Being a Positive Example for Others	"Our behavior can be more effective if we set an example for other people. For example, some people stopped using plastic straws after I warned them."
Using Effective Measures for Rewarding and Sanctioning	"In order to increase these behaviors' effect, the ones who do not care about environment need to learn from their unsustainable behaviors. It would be good if this lesson hurts his/her interests." "For example, local governments may offer incentives like 'recycle your plastic bottle, earn 0.05 Turkish liras for public transport'. Of course, nothing will change with this amount of money, but if someone say, 'let's put 20 bottles in the machine and earn a free ride', your incentive would be effective. This could be an important progress for local governments. Universities can do similar things."

Lastly, the respondents were queried about their feelings while engaging in pro-environmental behaviors and while refraining from doing so. The analysis demonstrated that they feel happy, proud, and peaceful after performing actions for the sake of the environment. Nevertheless, some of them perceived ecological conservation as their responsibility and do not experience any particular emotion. Conversely, when they were unable to act environmentally friendly or fail to do so, they reported unpleasant feelings, including guilt and sadness.

DISCUSSION

The primary aim of this paper was to qualitatively examine undergraduates' attitudes toward the natural environment and their in-campus pro-environmental engagement. Overall, our findings pointed out a higher level of environmental concern among our participants. Besides, they indicated that they perform several behaviors (e.g., recycling, and attending pro-environmental activities) for the sake of the environment. In addition, they highlighted that their motivation for exhibiting these behaviors can be influenced positively or negatively by several factors. Respondents also argued that both authorities and members (i.e., students, and employees) of the university should consider some points (e.g., the appropriate use of rewards and punishments, being a positive example for others) for increasing the effects of their actions. Lastly, positive emotions (e.g., pride, happiness) and negative emotions (e.g., guilt, sadness) were found to arise after they performed or did not perform pro-environmental behaviors, respectively. Here, the main aim is to discuss our results under the following subsections.

Attitudes Towards the Natural Environment: How Do They Form and Change?

Findings of the current paper pointed out several factors (e.g., environmentally friendly parents, constant interaction with nature) shaping respondents' environmental attitudes and altering them in the last five years (e.g., receiving education from an environmentally conscious university, membership of an environmental society in the university education). These are in line with the results of the prior academic work. In particular, previous studies suggested that higher environmental concern among family members (e.g., Casaló & Escario, 2016) and receiving education from ecologically friendly educators (e.g., Tanner, 1980). Prior work has also indicated that direct observation of ecological issues led individuals to more aware of these problems because of increasing level of threat perception to individual health (e.g., Fransson & Garling, 1999) as well as enhancing motivation to environmental conservation (e.g., Kothe et al., 2019).

Our participants also stressed that what they have (i.e., the campus ecosystem) is worthwhile, so it is essential to conserve it. However, they argued that the value of their campuses is not appreciated by most of their peers and this elicited anger in our respondents. Moreover, this anger led them to more aware of environmental issues on campus. Earlier literature (e.g., Reese & Jacob, 2015) has found evidence to support this hypothesis, although the presence of others (e.g., Fu et al., 2018) demonstrated that feeling anger may take an inhibitory role in taking action for the sake of the environment.

A majority of previous academic work on environmental sustainability highlighted the predictive role of caring for other people and non-human entities in pro-environmental engagement. In particular, self-transcendence values (e.g., Schultz et al., 2005) were found to positively predict individuals' pro-environmental engagement. However, people may also perform environmentally friendly behaviors without altruistic or biospheric motives. Specifically, personal motives (e.g., saving money, being appreciated by other people) encourage pro-environmental behaviors (see Palomo-Velez & Vugt, 2021 for a review). Likewise, some of our participants reported that personal motives have an essential role in the formation of their pro-environmental attitudes. So, although biospheric values are the most consistent source of environmental sustainability in terms of human values (e.g., Lindenberg & Steg, 2007), the effect of emphasizing possible personal gains cannot be denied (de Dominicis et al., 2017; Griskevicius et al., 2010; Van de Vyver et al., 2018).

Most of our participants indicated that their level of environmental concern has changed for the better in the last five years and they believed that university education plays a major role in this improvement. In particular, all undergraduates indicated that there are various student organizations for environmental conservation. Besides, Middle East Technical University students have an

opportunity to take courses about environmental sustainability (Yeşil Kampüs Topluluğu, n.d.) and sustainability efforts in Middle East Technical University (Middle East Technical University, n.d.) seem higher as compared to Selçuk University (Selçuk University, n.d.). In conjunction with this finding, earlier literature indicated that engaging in student societies for environmental protection (e.g., membership, attending their activities) and classroom discussions on ecological problems predicted ecological awareness and the frequency of sustainable actions positively (Helferty & Clarke, 2009; Pizmony-Levy & Michel, 2018).

On Campus Pro-Environmental Behaviors: Its Motivators and Barriers

As illustrated earlier, our respondents perform a number of behaviors (e.g., reducing waste and littering, and engaging in environmental organizations) for the conservation of the campus environment. Besides, some factors influence their protection motivation negatively (i.e., barriers) or positively (i.e., motivators). In particular, some of our participants noted that observing the careless behaviors of their peers motivates them to adopt environmentally friendly habits. However, in another study (see Fu et al., 2018) the unsustainable actions of others were found to hinder one's ability to engage in pro-environmental behaviors on university campuses. So, what are the possible reasons for this difference? Although not measured quantitatively, undergraduates' positive statements about their campuses implied that they emotionally belonged to their campuses and identified themselves with reference to the university. This source of conservation motivation seemed to be higher in Middle East Technical University students. Undergraduates' statements indicating the need to protect university's ecologically aware legacy (Middle East Technical University, n.d.) are an example of this. Their concerns regarding the possible change of campus' accessibility policy also possibly stemmed from their emotional attachment to their campus. Supporting this, Middle East Technical University students were found to have higher levels of campus attachment and university identification (Sarı & Bükün, 2023). Previous work also highlighted the positive relationship between campus attachment and campus sustainability in university campuses (e.g., Krasny & Delia, 2015) and other contexts (e.g., Scannell & Gifford, 2010; Ramkissoon et al., 2012).

Most of our interviewees expressed higher concern for the natural environment. However, they also underlined the existence of several factors (e.g., lack of time, perceived difficulty of acting sustainably) inhibiting their pro-environmental engagement. Similarly, previous studies pointed out to the presence of multiple obstacles to engaging in sustainable actions, including receiving insufficient or negative feedback regarding behavior, a lack of incentives (e.g., money), receiving no support from relevant officials (e.g., rectorate, municipality), and a dearth of opportunities for eco-friendly activities (Fu et al., 2018; Kollmuss & Agyeman, 2002; Yuriev et al., 2018).

Amplifying the Impacts of Sustainable Actions: What Should We Do?

According to the interviewees, there are several factors that must be taken into account to maximize the positive impact of pro-environmental behaviors. In addition to the priorly mentioned concept of being a positive example for others and engaging in pro-environmental organizations, respondents emphasized the use of images and videos for depicting climate crisis threat. In line with this, Kateman's (2020) paper highlighted that visual content can be a powerful tool in influencing individuals' decisions, as they can evoke feelings and retrieve previously acquired information. Supporting this, another paper also pointed out the effectiveness of images since they easily overcome the language barrier, and reach a wider audience (Popp & Mendelson, 2010). Besides, a multi-nation study (Zhang & Zhong, 2020) demonstrated that visualizing the effects of climate change has a greater impact on sustainability in countries complaining about environmental degradation more. Therefore, it can be inferred that using social media (e.g., Facebook groups, Twitter) may also have a significant

impact on universities where waste pollution is prevalent when considering its role in disseminating visual content to wider audiences.

Using a proper system for rewards and punishments may also increase the impact of on-campus pro-environmental behaviors, as our interviewees suggested. Considering a strong appreciation for the natural environment and a dedication to preserving the campus heritage are two principles of Middle East Technical University, engaging in actions that harm the campus ecosystem may be viewed as in-group norm violation. Prior academic work regarding the influence of social norms on environmental sustainability suggested that following the in-group standards can promote ecological sustainability (see Helferich et al., 2023 for a meta-analysis). Nevertheless, it is uncommon that everyone in a group to adhere to these social norms, and the violation of these norms has several consequences. Particularly, individuals may display emotional reactions (e.g., anger) towards those who violate norms (e.g., Kam & Bond, 2009), and this anger can subsequently drive their desire to punish the transgressors, as observed by Landmann and Rohmann (2020). On the other hand, failing to abide by social norms can elicit feelings of guilt in individuals, as noted by Giguere and colleagues (2014) and Tangney and colleagues (2007). Parkinson et al. (2005) further suggest that people who experience guilt often intend to make reparations for their actions and express remorse. In the Turkish context, Sarı et al. (in preparation) demonstrated that violation of the in-group norm of "sensitivity to the natural environment" predicted collective action intentions through increased anger and decreased pride scores related to norm violation.

Aside from sanctioning individuals harming the environment, rewarding undergraduates (e.g., free meals in exchange for recycling) acting in a pro-environmental manner may be also effective to encourage campus sustainability, as our respondents suggested. Likewise, previous research suggested that the existence of incentives may be a motivating factor for pro-environmental engagement, specifically in terms of domestic recycling (e.g., Gibovic & Bikvalfi, 2021) and on-campus pro-environmental behaviors (e.g., Fu et al., 2018). Besides, a meta-analysis study (Nguyen-Van, 2021) indicated that institutional trust also needs to be taken into consideration for an effective implementation of pro-environmental behaviors. In particular, individuals - or undergraduates in our case - may be more willing to support pro-environmental policies and abandon their unsustainable habits if they have optimistic expectations about the future results of institutional (e.g., municipality, rectorate) policies in the long run.

Our analysis also showed that undergraduates typically experience positive emotions, such as happiness and pride after performing actions for the benefit of the environment. However, some participants viewed ecological conservation as their duty and did not report any particular emotion. On the other hand, when individuals were unable to act in an environmentally friendly manner or failed to do so, they reported negative emotions such as guilt and sadness. So, it can be implied that experiencing positive emotions and avoiding unpleasant feelings may be two motivating factors for undergraduates' pro-environmental engagement on campus. In line with this, previous work suggested that emotions can also serve as a motivating factor for individuals to take action regarding ecological conservation (see Landmann, 2020 for a review). Specifically, individuals have been found to perform pro-environmental behaviors, including recycling and preferring sustainable mobility options to avoid negative emotions (Carrus et al., 2008).

Earlier research has demonstrated that experiencing positive emotions (e.g., happiness, pride) or the possibility of it can be a powerful motivator for pro-environmental engagement, similar to our findings. Particularly, positive affect has been found to lead to pro-environmental behaviors, including sustainable consumption (Nguyen et al., 2022) and reducing private car use (Csutora & Zsoka, 2013). del Saz Salazar and Perez y Perez (2022) showed that life satisfaction predicts high-cost environmental

behaviors (e.g., willingness to pay higher public transportation fares to support actions to reduce carbon emissions) better than low-cost environmental behaviors (e.g., recycling). So, it can be inferred that high-effort in-campus pro-environmental behaviors (e.g., attending a protest to raise environmental awareness on campus) may be more effective for experiencing positive affect as compared to low-effort ones (e.g., recycling).

CONCLUSION

Both previous academic work and the results of this paper suggest that related officials (e.g., governments, and educators) should consider a number of points in terms of raising ecological awareness at an early age. In particular, the existence of environmentally aware role models in the family and educational settings has a huge role in instilling pro-environmental attitudes in children. As an example, Collado and colleagues (2017) highlighted that the influence of family members on their children's pro-environmental attitudes is particularly significant for the younger ones. Direct exposure to natural environments may also be influential in the formation of pro-environmental attitudes in children. Even more, numerous studies (e.g., Rosa et al., 2018; Wells & Lekies, 2006) showed that interacting with nature in earlier phases of life predict greater levels of environmental concern and pro-environmental engagement in adulthood. Therefore, it can be implied that environmental awareness should be instilled in children from the early stages of their lives. Ardoin and Bowers' (2020) paper suggested that environmental education in early childhood may also have positive effects on children's emotional and cognitive development. So, both governmental authorities should consider raising awareness of families about the environment as well as providing environmental education from an early age.

Getting higher education was also revealed as an important factor in changing our respondents' environmental attitudes for the better. Besides, they highlighted a number of points to maintain environmental sustainability on university campuses. Considering their opinions and relevant work discussed earlier in this paper, several points should be taken into consideration by university officials. First of all, the current study's findings imply that the campus atmosphere is an inseparable part of higher education. In particular, undergraduates' positive connotations of their campuses, Middle East Technical University students' intentions of protecting the university's ecologically aware legacy and campus ecosystem, and their worries regarding the possible change of campus' accessibility policy may be seen as some indicators their campus attachment and university identification. So, related authorities in universities should promote campus attachment. Furthermore, our analysis revealed that emotional processes play an important role in fostering environmental sustainability. Experiencing positive emotions (e.g., happiness and pride) after engaging in pro-environmental behaviors implies that there is a positive association between undergraduates' well-being (i.e., life satisfaction, and quality of life) and their pro-environmental engagement. So, related authorities should improve the life quality of undergraduates in the campus environments. Providing healthy and good quality dormitories, offering more restorative areas, ensuring a liberal atmosphere where everyone on campus expresses themselves without any hesitation, and offering a wider range of academic and cultural activities may not only help to enhance campus attachment and promote university identification but also support undergraduates' well-being. Forming environmentally friendly social norms in universities and emphasizing these norms through different tools (e.g., visuals depicting social norms regarding sustainability) on campus also need to be taken into consideration to encourage campus sustainability.

When reviewing the present paper's findings, it is important to take certain limitations into account. First, our findings relied on data gathered from semi-structured interviews. In other words, although it provides a rich understanding of campus sustainability from the viewpoint of our

respondents, it is not concerned with measuring variables regarding campus sustainability and testing related hypotheses using statistical analysis. Besides, it is misleading to draw any strong conclusion from this data since our design does not involve an experimental manipulation. To fill this gap, further research should test their hypotheses by using statistical methods. Specifically, future studies should examine possible predictors and consequences of on-campus sustainability by deriving hypotheses from this preliminary work. As an example, positive predictive role of emotional bonding to the university campus (i.e., campus attachment) and identifying the self with a reference to university (i.e., university identification) on on-campus pro-environmental engagement would be a good idea. Another limitation of the current paper is that we relied on data from two long-established universities in Türkiye. Besides, these universities have a large campus area that can satisfy almost all the needs of their students. Undergraduates from these universities also have an opportunity to enjoy a significant proportion of green areas on campus. Since the perception of green has predicted pro-environmental behaviors positively in contexts like neighborhoods (e.g., Alcock et al., 2020) and educational institutions (e.g., Tusyanah et al., 2023), future studies should be conducted on university campuses that relatively have fewer green space. Besides, future work should also compare undergraduates' pro-environmental engagement on campuses with varying levels of green space. In addition to these limitations, although no specific effort was made to ensure that participants were chosen based on their strong sensitivity to environmental protection, 5 of our 16 respondents were members of an environmental organization. Therefore, it was not surprising that these individuals have higher environmental awareness and perform more pro-environmental behaviors on campus. Additionally, more environmentally sensitive students may have been willing to participate in this study. So, further quantitative studies should consider using environmental concern as a control variable. Besides, almost all participants stated that they have become more sensitive to the environment in the last 5 years, but behaviors or attitudes related to environmental protection and sustainability are often viewed favorably in society. So, it is quite likely that their responses have been influenced from social desirability bias. To mitigate social desirability bias, future studies should rely on multiple data collection methods, including behavioral measures, diary studies, or observations. Lastly, previous research has demonstrated that the COVID-19 outbreak has resulted in heightened environmental consciousness among individuals. Despite these limitations, our paper is the first study navigating pro-environmental engagement in university campuses among Turkish-speaking undergraduate students and has an important potential to encourage future academic work for addressing the limitations identified in the present study.

Article Information

Ethics Committee Approval:	The study received Ethical Approval from Middle East Technical University with the approval number of 272-ODTU-2020 and the date of 29.09.2020.
Informed Consent:	The purpose of the study is explained to the particants and their informed consent was obtained.
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Conflict of Interest:	The authors declare that declare no conflict of interest.
Copyrights:	The required permissions have been obtained from the copyright holders for the images and photos used in the study.

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APPENDIX

Interview Questions

1. What are the first five words that come to your mind when you think about your university campus? (Üniversite kampüsünüzü düşündüğünüzde ilk aklınıza gelen 5 kelime ne olur?)
2. Which features of your campus do you like and dislike? (Kampüsünüzün hoşlandığınız ve hoşlanmadığınız özellikleri nelerdir?)
3. What comes to your mind when you think about the environment, can you share it briefly? (Çevre denilince aklınıza ne geliyor, kısaca paylaşabilir misiniz?)
4. What are the main factors that shape your current attitude towards the environment? (Çevreye karşı bugünkü tutumunuzu şekillendiren temel faktörler nelerdir?)
5. When you consider your current attitude towards the environment and your attitude from 5 years ago, do you think there is any difference between the two? (Çevreye karşı bugünkü tutumunuz ile 5 yıl önceki tutumunuzu göz önünde bulundurduğunuzda, ikisi arasında herhangi bir fark olduğunu düşünüyor musunuz?)
6. What do you think about the current environmental conditions of your campus? (Kampüsünüzün şu anki çevresel koşulları hakkında ne düşünüyorsunuz?
7. What are the responsibilities of university administration, students and employees in improving the environmental conditions at your university campus? (Üniversitenizde çevresel koşulların iyileştirilmesinde üniversite yönetimine, öğrencilere, çalışanlara ne gibi görevler düşüyor?)
8. When you think about 25 years later, what do you think the campus will be in terms of the environment compared to today? (25 sene sonrasını düşündüğünüzde sizce kampüs çevresel açıdan bugüne kıyasla nasıl bir durumda olacak?)

9. When you think about your life at campus, what actions are you taking to protect the environment? (Kampüsteki yaşamınızı düşündüğünüzde çevreyi korumak adına ne gibi eylemlerde bulunuyorsunuz?)
10. What are the factors that encourage or prevent you from engaging in pro-environmental behavior in the campus? (Sizi kampüste çevreci davranışlarda bulunmaya teşvik eden ya da bulunmaktan alıkoyan unsurlar nelerdir?)
11. In which situations do you think pro-environmental behaviors that you do on campus may be more effective? (Kampüste yaptığınız çevreci davranışlar hangi durumlarda daha etkili olabilir?)
12. What do you feel when you act (and not to act) in a pro-environmental way on campus? (Kampüs içerisinde herhangi bir çevreci davranış sergilediğinizde ve sergilemediğinizde ne hissediyorsunuz?)