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The Effect of Climate Change Education on the Knowledge and Awareness Levels of Atatürk University Students

Atatürk Üniversitesi Örneklemi'nde İklim Değişikliği Eğitiminin Üniversite Öğrencilerinin Bilgi ve Farkındalık Düzeylerine Etkisi

Aslıhan ESRİNGÜ[1], Süleyman TOY[2]

Öz

İklim değişikliği küresel bir problemdir. Türkiye ise iklim değişikliğinin çeşitli tehlikelerle günlük yaşamı etkilemeye başladığı ülkelerden biridir. Bu soruna önerilecek çözüm önerilerinden biri eğitim faaliyetleridir. Türkiye ise genç nüfus oranının AB deki diğer ülkelere göre daha yüksek olduğu bir ülkedir. Bu nedenle eğitim faaliyetlerine gençlerden başlamak gerekmektedir. Gençlere verilecek eğitim faaliyetleri ile doğru tutum ve yaşam biçimleri geliştirilerek farkındalıkları artırılarak çözümler üretilebilir. Yapılan bu çalışmaya, Atatürk Üniversitesinin İktisadi ve İdari Bilimler (Kamu Yönetimi, Ekonomi ve İşletme bölümleri), Edebiyat (sosyoloji ve coğrafya bölümleri; öğrenciler), Mimarlık ve Tasarım (Şehir ve Bölge Planlama, Mimarlık, Peyzaj Mimarlığı Bölümleri), Hukuk, Ziraat ve Turizm fakülteleri dahil edilmiştir. Bu fakültelerin farklı bölümlerinden toplam 60 öğrenci eğitime katılmıştır. Eğitim programı 3 gün devam etmiştir. Eğitim sırasında ön anket ve son anketler yapılarak eğitim faaliyetlerinin katılımcı öğrenciler üzerinde etkisi araştırılmıştır. Araştırmanın sonuçlarına göre, eğitimlerin katılımcı öğrencilerde iklim değişikliğinin nedenleri, etkileri ve sorunlara karşı alınması gereken önlemler konusunda önemli düzeyde farkındalık oluşturduğu belirlenmiştir.

Keywords: Eğitim, Uyum, İklim değişikliği, İklim riskleri, Üniversite öğrencileri

ABSTRACT

Climate change is a global problem. Turkey, on the other hand, is one of the countries where climate change has begun to affect daily life with various dangers. One of the solutions to this problem is educational activities. Turkey, on the other hand, is a country where the rate of young population is higher than other countries in the EU. For this reason, it is necessary to start educational activities from young people. With the educational activities to be given to the youth, solutions can be produced by increasing their awareness by developing the right attitudes and lifestyles. City and Regional Planning, Architecture, Landscape Architecture Departments), Law, Agriculture and Tourism faculties are included. A total of 60 students from different departments of these faculties attended the training. The training program continued for 3 days. During the training, the effects of the training activities on the participating students were investigated by conducting pre-questionnaire and post-questionnaires. According to the results of the research, it was determined that the trainings created a significant level of awareness in the participant students about the causes and effects of climate change and the precautions to be taken against the problems.

KEYWORDS: Adaptation, Climate change, Climate risks, Education, University students

[1] **Corresponded Author:** Department of Landscape Architecture, Faculty of Architecture and Design, Atatürk University, 25100 Erzurum, Turkey, esringua@atauni.edu.tr, 0000-0002-7930-5290
[2] Author address, suleyman.toy@atauni.edu.tr, 0000-0002-3679-280X

INTRODUCTION

Identifiable changes in prevalent climatic conditions over a long-time span result from “natural internal processes” or “external forcing factors” including those originating from anthropogenic activities (IPCC 2013, 2018, Türkeş 2020). As the impacts of climate change go beyond national borders and intensify depending on the geographical points, all types of earth surfaces face threats caused by the change. Over the last decades, awareness level among society has consistently increased about that human activities are the main cause of climate change depending on the witnessed impacts like heat waves, health problems, obligatory changes in lifestyles, loss of natural resources and unstable weather events (Abid et al., 2016). In order to be prepared for the risks of climate change, local action plans are advised to countries and regions. In this respect, local civil awareness and initiatives are forefront both to make their locations adaptive and mitigate their contribution to the change (Fernandez et al., 2018). Raising awareness through some formal or informal educational, training and meeting activities on sustainable environment and development including climate change and taking at least individual measures are among what people should do against climate risks (Tanrıverdi, 2010). In this sense, people should learn how to develop necessary individual attitudes, understanding, values and skills compatible with the new conditions caused by climate change to adapt and mitigate its impacts. Numerous countries have initiated programs, grants and projects to highlight the need to educate people in tackling with global climate change (Liu et al., 2016).

As one of the countries in the Mediterranean region with high vulnerability in terms of climate change, Turkey is counted among the risk group (Gezer and İlhan, 2021). According to Turkey’s climate assessment report, 2020 experienced the most extreme weather events with 984 events e.g. heavy rain/flood (30%), storm (27%) and hail (23%). Other events were lightning (7%,) snow (5%), landslide (2%) and frost and avalanche, wild fire, sandstorm, high temperature and fog by less than 1%. In the same report, it was emphasized that there has been an increasing trend in extreme weather events, especially in the last two decades (MGM, 2021). Therefore, especially young people should be aware of all climatic matters from its reasons to results and adaptation and mitigation measures including individual ones. Environmental education is expected to give theoretical information and develop skills, behaviours and build values among the targeted mass (Ardoin et al., 2020). When the society becomes ready to combat climate change by increasing awareness levels and creating a social layer at the first step who can move for common benefits to protect environment then the collaborative actions can be possible. In this development process the role of effective environmental education using various techniques is vitally important. It is reported in a review study (Ardoin et al., 2020) analysing 105 studies on environmental education that the programs focus on direct and indirect outcomes and those involving indirect results are generally confined to local issues. In a survey study conducted among pre-service teachers, it was seen that 84.3% of pre-service teachers agreed that environmental education should be started in pre-school period (Öztürk and Öztürk, 2015). Environmental education is an important issue that should be developed with formal education starting from the family of the individuals and should be supported by the society (Çabuk and Karacaoğlu, 2003). In a study conducted by Messer (2015), it is reported that there is some evidence that individuals who have received higher education are more aware of the effects of their behaviour and more interested in social welfare. From this perspective, it will be easier to understand that environmental education helps to build a society that is more conscious of its own decisions and moves towards a sustainable future.

It was shown in a study (Oğuz et al., 2011) conducted on the students from Landscape Architecture, Environmental Engineering and City and Regional Planning department at Ankara University, Turkey that the level of environmental awareness is independent of the students' departments and although they are conceptually aware of environmental problems and conservation of resources. Sivamoorthy

et al., (2013) stated that university students in India reflected high level of awareness in all activities related to the environment regardless of gender. Sadati (2014) found in the scope of a survey study conducted over 150 students at different faculties of Eastern Mediterranean University, North Cyprus Turkish Republic to measure their level of knowledge about environmental problems that the general environmental awareness and knowledge level of the students were quite low.

Environmental education should be in a structure that covers the process from pre-school period to the end of higher education (Güven, 2013). The education provided is seen as an important way to raise awareness of students about environmental problems (Fernández-Manzanal et al., 2007). The aim of environmental education is not only to increase the knowledge level of individuals, but also to ensure the formation of sustainable societies by mobilizing changes in environmental attitudes and behaviours and to protect the sustainable environment (Sönmez, 2018; Guerra et al., 2020). As students will be the decision-makers of society in the near future, their attitudes and behaviours on environmental protection are vital for successful environmental development (Saadati 2014). Therefore; the priority of higher education institutions should be to foster interdisciplinary thinking and analysis (Azeiteiro et al., 2015). Considering that university campuses are a part of the city ecosystem, their social role is to set an example for sustainable practices as they have an impact on the environment (Bantanur et al., 2015; Cortese, 2003). It was found as the result of a survey study (Sahu et al., 2015), which was carried out over 117 university students from various departments that their environmental awareness level was not high enough. It was suggested in another study carried out in China that environmental education should be improved and evaluated systematically in the majority of higher education institutions in the country to meet the increasing demand for sustainable development and the protection of natural resources (Xiong et al., 2013).

UN Sustainable Development Goals make universities responsible for environmental education due to their institutional framework (Ramos et al., 2015). Wachholz et al. (2014) stated that it is only possible through higher education to transfer information about environmentally friendly activities and actions. In especially the 21st century, the increase in the number and variety of environmental problems and the pressure of the increasing human population on natural resources caused universities to integrate in the matter (Guerra et al., 2020). Youth have raised their awareness and developed sensitiveness towards environment and climate change through various types of education, training and media. Global Shapers Annual Survey 2017 by the World Economic Forum (WEF 2017) over 25,000 young people all over the world shows that nearly half (48.8%) of all young people see climate change and destruction of nature to be the matter to impact the world today. Ninety percent of 1.8-billion young people (10 – 24 years) all over the world live in the developing countries (Fatusi, 2016). Turkey is categorised among the developing countries by United Nations (2020) and 15.4 % of country's population is composed of young people between 15 and 24 years old.

Impacts of climate change on youths in the developing countries are expected to be larger than those in developed ones thus bringing additional social, economic and political loads to youths. Therefore, it is vitally important to prepare international, national and local mitigation and adaptation strategies with the participation of young people. For this aim, it would be beneficial to increase the awareness and interest of young people about climate change through formal or informal education activities such as formal lectures, short training courses, conferences, trainings, congresses and workshops.

This study was conducted to 1) give brief information about a EU supported project, University Youth is Discussing Climate Change at the peak of Anatolia, carried out in the east part of Turkey with the participation of university students; 2) to show the results of a short – term training on climate change applied to the students and 3) to investigate and determine the perception about climate change, environmental awareness and concerns among youth to assess the need for education or regulation on the educational system at especially higher education.

Material and MethodMaterial and Method

2.1. Study Area

This study was carried out at Atatürk University in Erzurum, which is in the eastern part of Turkey (1.850 – m to 2.100- m elevation and 39.55N and 41.16E in TRA1 NUTSII Region). The University is a largely – structured body with 24 faculties, 8 institutions, 13 vocational schools and 42 research and application centres and implements projects also about 13th Goal, Climate Action.

2.2. Study Group

In 2019, an EU Project, “University Youth Discussing Climate Change at the summit of Anatolia” was conducted to raise awareness about climate change among university students. In the scope of the project, subjects were selected from the 2nd and 3rd grade students at Economics and Administrative Sciences (10 students), Literature (10 students), Architecture and Design (10 students), Law (10 students), Agriculture (10 students) and Tourism faculties (10 students). Totally 60 voluntary students (58.3% female) were included in the study. Atatürk University Ethics Committee conformity-approval certificate was obtained from the Science and Engineering Ethics Committee on 07.12.2021 for the study.

2.3. Method and Data Collection

Each student included in the study completed a questionnaire form uploaded in digital media before the training program. A training program including a half – day seminary and a detailed one – day informative lecture about climate change was applied to the students. All the program was headed with the participation of two international experts Prof. Dr. M.T. and Dr. M.D. Both experts have deep information about the causes and results of climate change and adaptation and mitigation aspects since they represent Turkey several times at scientific international meetings like those of IPCC. Specialists informed the students about the thematic and sectoral conditions at present and in the future. After the training program, students completed again the questionnaire form to determine their knowledge and awareness level after the project.

It was aimed to determine the effect of the climate change training on participant students using a one – group pre-test – post – test study design (before and after training without a control group; Karasar, 2005). Students’ improvement level for the awareness and knowledge for climate change was assessed by applying climate change awareness scale to students before and after the education activities.

A qualitative data collection tool was used to assess students’ improvement level in terms of awareness and knowledge about climate change. An awareness level scale including 24 questions was used as a data collection tool to assess participants' knowledge and awareness about climate change. Questions in the questionnaire determine the change in the knowledge and awareness of the students as a result of the project activities regarding climate change. Likert scale involved the options of "Agree", "No idea" and "Not agree". While creating the mentioned scale, those in previous studies on the same subject were used for the evaluation (Mead et al, 2012; Cvitanovic et al. 2014; Pfautsch and Gray, 2017; Frondel et al. 2017; Visschers 2018). The scale was applied to the students before and after the training to determine the improvement in their awareness levels. In addition, Chi-square test was used in the evaluation of the last survey questions. Each question has been tested with 95% confidence.

RESULTS AND DISCUSSION

Students' responses to the questions were evaluated in percentage distributions in the following tables. In order to determine the students' knowledge level about climate change, the question "Have you ever heard about climate change before?" was considered and the distribution of the answers "Yes", "No" and "No Idea" was 95.5%, 3.0% and 1.5%, respectively. This question was included in the list before training and the answers show that a very significant portion of the students have heard about climate change before.

In order to determine the in-depth knowledge level of students about the climate change, the question "Would you say you know what climate change means?" was considered before and after the training. It is seen that before the training 23.4% of the students replied "absolutely yes" before training and 72.3% after the training. Training is supposed to have high level impact on the knowledge development of students about climate change. This result can also reveal the interest of students in the environmental matters i.e. climate change (Table 1). It is also seen from Table 1 that the choices "Partially", "No idea" and "Not much" decrease after training possibly because a significant portion of the students learned and gained self - confidence about the definition and scope of climate change.

Table 1. Students' views on the meaning of climate change

Would you say you know what climate change means?							
Absolutely Yes		**Partially**		**No idea**		**Not much**	
Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
23.4%	72.3%	68.8%	25.5%	1.6%	-	6.3%	2.1%

The questions "Have you heard about climate change before this survey" and "Can you tell us what climate change means"? are evaluated together. It is thought that students had only superficial opinions about climate change and they were informed sufficiently after training. The question "Do you think climate changes? / Do you believe the climate is changing more and more?" are evaluated based on the students' replies. Students think that climate changes before and after the training (Table 2). It is seen from the results that students heard about climate change, but they did not know enough about the definition and effects of climate change. The students reflected a considerably high level of awareness about climate change. However, they believed before the training that their knowledge is not sufficient but increased significantly after training. In a survey study conducted by Li and Liu (2021) on university students, preliminary research results showed that 97% of students believe it exists and have a high level of anxiety about global warming.

Table 2. Students' views on the existence of climate change

Do you think climate changes? / Do you believe the climate is changing more and more?		
	Yes	**No**
Pre – test	98.5 %	1.5 %
Post – test	100 %	-

The students' responses to the question "What are the causes of climate change?" before training included at the first three rows are fossil fuels, greenhouse gases from large companies and motor vehicles while after training they are the same but in different order and percentages (Table 3). In a similar study, comparing the views of US and Chinese university students on climate change, it was revealed that only 59% of US students and almost all Chinese students believed that the causes of climate change were primarily due to human activities (Jamelske et al., 2013).

Table 3. Students' views on the causes of climate change

What are the reasons for climate change?		
Causes	**Pre-test %**	**Post-test%**
Fossil fuels such as oil and coal	77.3	93.6
Greenhouse gases from large companies and motor vehicles	75.8	85.1
Deforestation	66.7	91.5
Greenhouse gases (methane) from livestock breeding	39.4	85.1
Natural events like ocean currents	22.7	53.2
No idea	1.5	-
We cannot say only one event but it is nature's usual behaviour	1.5	-
Humans' misuse of natural resources	1.5	-

Students' responses to the question related to possible effects of climate change in the future before and after the training in the first three rows are temperature increase, loss of flora and fauna and decrease in rainfall in varying percentages (Table 4). After many negative events such as wild fires, floods, temperature increase, sea level rises, loss of fauna and flora due to climate change, people may experience hopelessness and anxiety (Cunsulo and Landman 2017; Cunsola and Ellis 2018).

Table 4. Students' views on the possible effects of climate change in the future

Do you know anything about the possible effects of climate change in the future in your city, country or in the world?		
Possible effects	**Pre-test %**	**Post-test %**
Temperature will increase	80.3	97.9
Loss of flora and fauna	57.6	68.1
Rainfall decrease	45.5	53.2
Trees will die	45.5	68.1
Erosion increases	40.9	63.8
Sea level rises	36.4	70.2
Rainfall increases	28.8	42.6
Ocean's temperature will increase	22.7	38.3
Temperature decreases	13.6	8.5
There is an order in nature right now	1.5	-
It will affect city life	1.5	-
Disasters will increase	-	2.1
No idea	1.5	-

Responses of students to some statements regarding climate change before and after the training are given in Table 5.

Table 5. Students' views about the statements on climate change

Absolutely agree		**Agree**		**Indecisive**		**Disagree**		**Absolutely disagree**	
Before %	**After %**	**Before %**	**After %**	**Before %**	**After %**	**Before %**	**After %**	**Before %**	**After %**
Human activities are responsible for climate change									
53.0	79.5	39.4	25.0	6.1	2.3	2.3	-	-	-
Every individual can do something to adapt to climate change									
42.4	88.6	42.4	18.2	15.2	-	-	-	-	-
Natural changes in the environment are also responsible for climate change									
34.8	51.1	42.4	31.9	19.7	17.0	3.0	-	-	-
Living today is more important than worrying about the effects of climate change fifty years later									
12.1	6.4	28.8	17.0	9.1	12.8	24.2	17.0	25.8	46.8
Climate change can reduce the quality of life of future generations									
65.2	78.7	31.8	14.9	1.5	2.1	1.5	-	-	4.2

It is seen from the analysis of students' responses that the thoughts about the statement "Living today is more important than worrying about the effects of climate change fifty years later." shifted very clearly from "agree" and "indecisive" to "absolutely agree" after training. Such a result clearly reveals that the training in the project caused a significant improvement in students' understanding of climate change.

Another question is aimed to determine students' feelings (emotions) towards climate change. It was determined that the emotions of "dreadful", "sad" and "hopeful" are dominant among the responses (Table 6). The critical result is that the rate of feeling "sad" decreases after training compared to those before training. The rate of "hopeful" and "dreadful" increases after training compared to that before training. These results may show that the training introduced the scope of climate change thoroughly and gave detailed information about the adaptation and mitigation efforts, global political initiatives on the world agenda. Therefore, when students learned the causes and impacts of the change and international efforts, they felt some terrible and then their sadness began to remove and turned out to be hope. In other words, it is understood that a significant number of students developed an understanding that some measures can be taken for climate change and the negative situation can be controlled. However, it is observed that approximately one – fourth of the students have "dreadful" feeling about climate change and this tendency continues despite the activities.

One of the questions students replied before and after the training was "Would you like to learn more about climate change?" For the mentioned question, majority of the students replied that they want to proceed learning about climate change both before and after training even though a small rate of decrease is seen after training. This may be due to that students learned complex relations between the factors causing climate change and from an academic perspective they realised that the studying climate and climate change is a difficult subject (Table 6). Stewart (2021) supports the present results. The observed consequences of climate change or its possible effects in the future have revealed that it can lead to psychological-based reactions such as fear, stress, trauma, depression and anxiety in individuals. Specifically, anxiety and worry have become the focus of research on the psychological effects of climate change. In another study, researchers in Australia observed that climate change creates stress, anxiety and depression (Searle and Gow 2010). In June 2016, a 15-item cross-sectional questionnaire investigating climate change knowledge, anxiety, and behaviour change was administered to 1118 university students at nine universities across Taiwan. It was determined that 65% of the respondents were "somewhat worried" and 28% were "very", while the rest were at a negligible level. It was also revealed that the most important need is not more education but policy leadership (Giusto et al, 2018).

Table 6. Students' views on their feelings and knowledge about climate change

How do you feel about climate change?		
Feelings	**Before (%)**	**After (%)**
Dreadful	22.7	23.4
Indecisive	9.1	4.3
Angry	3	-
Sad	33.3	23.4
Worried	1.5	-
Weak	3	2.1
No feeling	1.5	-
Hopeful	25.8	46.8
Would you like to learn more about climate change?		
Yes	95.5	93.6
No	-	2.1
No matter	4.5	4.3
Not sure	-	-

In order to determine whether the students know about the individual measures to take to adapt or mitigate climate change, two questions were asked before the training. Their replies and long answers are given in Table 7. It is seen from the results that 59.1% of the students answered "No" and "No idea" while 40.9% answered “Yes”. By considering the answers, it is understood that a considerable rate of the students tries to do something against climate change, but they do not know the relation of these measures with climate change. The rates of students performing activities such as turning off the lights and tap is quite high (86.4% - 89.4%) but the rate of those answering "No" and "No idea" is higher. This shows that the students really have no idea about what to do for mitigating or adapting climate change.

Table 7. Students' views on adaptation and struggle against climate change

Have you ever taken any measures to adapt / combat climate change?	
Answers	**%**
Yes	40.9
No	45.5
No idea	13.6
Have you ever done anything to adapt / combat climate change?	
I planted grassy plants	27.3
I planted trees	72.7
I protected plants from chopping	24.2
I cared for trees and vegetation	21.2
I cleaned the garbage from the water drains	13.6
If not in use I turned off the lights	86.4
I turned off the taps if not used	89.4
I made green areas like parks and gardens	10.1
No idea	1.5

The students were also asked whether they had experienced any unusual weather events (flood, heat waves, drought etc.) before training and the answers are presented in Table 8.

Table 8. Students' opinions and experience about the extreme weather events

Have you ever experienced extreme / unusual weather events?		
Yes	No	I don’t remember
57.6 %	33.3 %	9.1 %
What extreme / unusual weather events have you experienced?		
Flood due to heavy rain		48.5 **%**
Flood from sea or surface runoff overflow		15.2 **%**
Drought		18.2 **%**
I haven’t experienced		4.5 %
I don’t remember		33.3 **%**

From the table, it is seen that more than half of the students have experienced extreme meteorological events such as droughts or floods caused by the sea or overflow of surface currents. The importance of experiencing such events is that students are expected to be more sensitive to climate change and its expected results. When considering the type of extreme events in the same table, it is seen that some of the students do not even remember their experience but a significant part reported that they experienced extraordinary meteorological events. Such students are expected to be more interested in the climate change and they are accepted to be more prone to learn about it. This situation is also supported by the rate of replies to previous questions (e.g. Would you like to learn more about climate change? in Table 6).

Questions about the possible measures to be taken by students to extreme events as well as about the sources of warnings were evaluated based on the answers given in Table 9. It is seen that a significant rate of the students (37.9%) does not even have any idea about what kind of measures they can take for extreme events. This result shows how important and necessary it is to inform students and people in general. The answers related to the extreme meteorological events show that more than half of the students were affected negatively by these events. It can be stated that these negative effects will make students and people in general more sensitive to weather and climate – related issues and behave responsible for taking measures. From the answers to the question related to the source of meteorological warning information, it is understood that the students learned the warnings mainly from television, internet and social media. It was determined as the result of the study conducted on 400 students from 2 private and 2 state universities in Bangladesh that education and social media were effective on the environmental awareness of people in the rates of 98% and 78.8% respectively (Majumder 2017). It was suggested in a study conducted at the Sulaimani University in Iraq that various educational activities such as seminaries should be organised to increase awareness level of students towards environmental matters since formal courses for students are insufficient (Hamaamin et al., 2019). Students were reported to show higher level of awareness and perform environmentally friendly attitudes and behaviours after getting an education on environmental problems and protection (Schmidt & Blumentritt 2007). At Baia Mare North Central University, 358 students from different specialties (engineering, electrical, mechanics and economics) were surveyed to examine the relationship between their students' perceptions, attitudes and environmental behaviours. In this study, it was stated that the students engaged in activities related to environmental protection (volunteering, warning, participation, recycling of materials) using new products and “greener” energy (Boça and Saraçlı 2019). It is known that mass media, non-governmental organizations and social media play a very active role in raising environmental awareness among individuals (Jusoh et al, 2018). Another study which investigated the source of awareness among the students attending university found that 75.5% of them get information from the internet and TV (Erdal et al., 2013).

Table 9. Students' views on the measures to be taken against extreme weather events, their types and source of warnings

Answers	**%**
What have you done to be prepared if you experience the same events again?	
A more reliable house against disasters	-
I cleaned the water drain	3.0
I planted a tree	10.6
I tried to stop tree chopping	39.4
I took care of trees and other plants	22.7
Nothing	15.2
No idea	37.9
I haven’t experienced	1.5
How did the severe meteorological events you experienced affected you?	
It caused damage to my house	12.1
It harmed animals	16.7
It destroyed agricultural products	45.5
Caused financial loss	24.2
It harmed public health	13.6
It destroyed drinking and potable water	15.2
None	13.6
No idea	13.6
No answer	12.1
How can you be informed about warnings for meteorological events**?**	
Radio	6.1
TV	84.8

Newspaper	15.2
Internet	81.8
Friends /Family	31.8
Social media	59.1
I observe the changes in the weather	30.3
None	0
No idea	1.5

Answers to the question related to the protection from extreme weather events are given in Figure 1. It is seen that small portion of the students stated that they have not been informed by the authorities about what to do during severe weather events. The final question is about the education activities like informal training or class at school on climate change. According to the answers given it is seen that a considerable part of the students does not attend such meetings or classes (Figure 1).

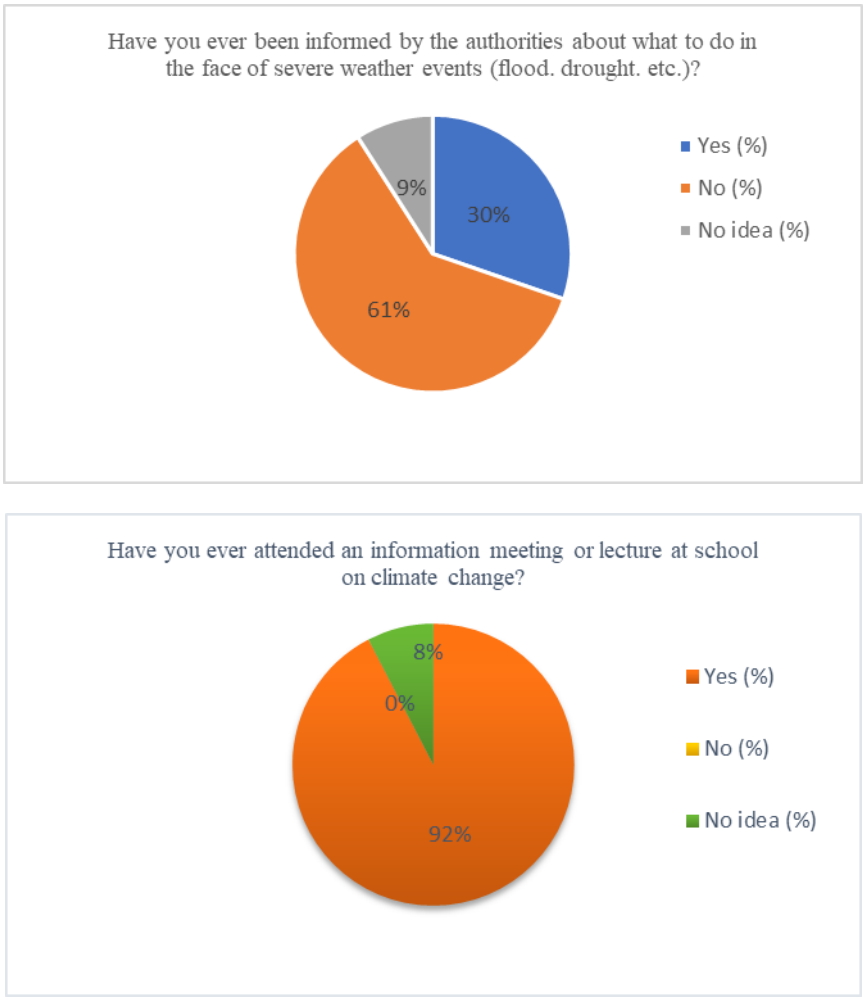


Figure 1. Informing students about weather events and their views on taking lessons about climate change

Statistical Analysis of Students Participating in Education by Gender, Age, Faculty and Department

Differences by Gender

The answers given by the students according to their gender were statistically evaluated according to the chi-square test. The expressions and test results that are different ($p < 0.05$) as a result of the statistical analysis are shown in Table 10. “Have you ever encountered extreme/extraordinary weather

events?" (flood, big waves, drought, etc.) and the answers of those who answered "yes" are dependent on gender.

Table 10. Expressions with significant differences according to gender

Questions	Chi-Square	P
Have you ever experienced extreme / unusual weather events?	9,553[a]	0,008
If yes, what were these events?	18,509[a]	0,018

Differences by Age

The answers given by the students according to age were statistically evaluated according to the chi-square test. The expressions and test results that are different (p <0.05) as a result of the statistical analysis are shown in Table 11. "Have you ever taken any measures to adapt / combat climate change?" The answer of this question is age dependent. "How do you stay informed of warnings about meteorological events?" It was determined that the question differed significantly according to age.

Table 11. Expressions with significant difference according to age

Questions	Chi-Square	P
Have you ever taken any measures to adapt / combat climate change?	94,000[a]	0,000
How do you stay informed of warnings about meteorological events?	94,000[a]	0,000

Differences by faculty

The answers given by the students according to their faculties were statistically evaluated according to the chi-square test. The expressions and test results that are different (p <0.05) as a result of the statistical analysis are shown in Table 12. The questions "Have you ever experienced extreme / unusual weather events? How can you be informed about warnings for meteorological events?" "Have you ever taken any measures to adapt / combat climate change?" It was determined that the answers to the questions differed significantly according to the faculties and the answers were dependent.

Table 12. Expressions with significant differences according to faculties

Questions	Chi-Square	P
Have you ever experienced extreme / unusual weather events?	80,375[a]	0,001
How can you be informed about warnings for meteorological events?	580,316[a]	0,012
Have you ever taken any measures to adapt / combat climate change??	561,907[a]	0,008

Differences by department

The answers given by the students according to the departments were statistically evaluated according to the chi-square test. The expressions and test results that are different (p <0.05) as a result of the statistical analysis are shown in Table 13. The answers to the questions of "Would you say you know what climate change means?" "Do you know anything about the possible effects of climate change in the future in your city, country or in the world?" "Would you like to learn more about climate change?" "How did the severe meteorological events you experienced affected you?" were determined to differ significantly according to the departments and the differences in the results were dependent on the departments.

Table 13. Expressions with significant differences according to the departments

Questions	Chi-Square	P
Would you say you know what climate change means?	81,94[a]	0,003
Do you know anything about the possible effects of climate change in the future in your city, country or in the world?	861,667[a]	0,016
Would you like to learn more about climate change?	69,432[a]	0,036
How did the severe meteorological events you experienced affected you?	616,222[a]	0,026

CONCLUSION

The study is expected to change the perception of students about climate change because they raised both their knowledge and awareness at significant rates. They heard about climate change before but had no efficient information about it. In the study, participant students learned what climate change means after the training activities. Students' knowledge level about the causes of climate change seems to increase since a significant portion of the students raised awareness about the causes of climate change after training. The awareness level among the students related to climate change for its possible future effects seems to have increased after training. As the result of the education given, the majority of the students have changed their opinions about the climate change. A significant portion of the students previously experienced floods, drought, heat waves etc. and faced extreme weather events. Students are not aware that some activities in daily life may be indirectly important for the climate change process. Students have raised awareness to a certain degree towards that people will be affected more by the problems due to climate change in the future. It was seen that a significant portion of the students developed an understanding as the result of the education that required measures could be taken for climate change by controlling the negative situations. The students are aware that trees are among the important factors in the mitigation of the effect of climate change and the maintenance of trees and other plants is important. Among the measures to be taken against climate change, prevention of trees from chopping is counted in the first rows by students thus the students gained awareness about the importance of trees in this process. It is seen that students are not informed about what to do in the face of severe weather events. Students have not participated in any training / education activities related to climate change before. Students got information and warnings about meteorological events from mass media such as radio, TV, internet and social media. It can be concluded that the educational activities carried out in the project caused a significant improvement in students' understanding of climate change. In addition, as a result of the statistical analysis, it was determined that the factors of age, gender, faculty and department were effective on the answers given by the students to the survey questions. It is reported in several reports beginning with those belonging to IPCC that the impacts of climate change may be seen denser in the less developed and developing countries. Turkey is a developing country and its natural resources are being used for the economic development. In order for the country to develop sustainably, decision makers in the future should be aware of the present situation of climate change and future projection. Therefore, education programs including several types of activities like seminary, conference, workshop etc. should be organized in especially universities. Educating university students is an easy way to disseminate the subject and increase the awareness level since they are very active in social media and daily life. It is important and urgent to ensure that young people who will be in management positions in the future participate in climate policy and create the necessary representation mechanisms.

Compliance with Ethical Standard

Conflict of Interests: The authors declare that for this article they have no actual, potential or perceived conflict of interests.

Ethics Committee Approval: Ethics committee is required for this study

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