Uluslararası İleri Doğa Bilimleri ve Mühendislik Araştırmaları Dergisi
Sayı 8, S. 335-339, 10, 2024

Araştırma Makalesi

IJANSER
https://as-proceeding.com/index.php/ijanser
ISSN:2980-0811

International Journal of Advanced Natural Sciences and Engineering Researches
Volume 8, pp. 335-339, 10, 2024

Research Article

Investigating University Students' Knowledge of Climate Change Levels via Statistical Methods: Isparta Province Analysis

Cengiz GAZELOGLU[1] and Ece OZGOREN UNLU[2*]

[1]*Department of Statistics/Suleyman Demirel University, Türkiye*
[2]*Department of Statistics/Suleyman Demirel University, Türkiye*

[*]*(eceozgoren@sdu.edu.tr)*

(Received: 23 November 2024, Accepted: 26 November 2024)

(2nd International Conference on Trends in Advanced Research ICTAR 2024, November 22-23, 2024)

ATIF/REFERENCE: Gazeloğlu, C. & Ozgoren Unlu, E. (2024). Investigating University Students' Knowledge of Climate Change Levels via Statistical Methods: Isparta Province Analysis. *International Journal of Advanced Natural Sciences and Engineering Researches*, 8(10), 335-339.

Abstract – The aim of this study is to determine the perceptions and knowledge levels of Süleyman Demiel University students residing in Isparta about climate change and to examine the relationship between these perceptions and gender, age, personal income, duration of residence, climate change expression and information source variables. For this purpose, data was obtained by administering a survey to 400 volunteer students between September and January 2023. T-test and One Way Analysis of Variance (ANOVA) methods were used to analyze the data. The findings show that the knowledge level of women is higher than that of men, and the awareness levels of students in the 20-22 age group are higher than other age groups. In terms of income level, it was concluded that students in the income group of 7001 TL and above are more conscious than other groups. Additionally, it was determined that the knowledge levels of students who resided in the region for 0–1 year were higher. It was observed that the knowledge levels of the students who stated the expressions Global Warming and Drought were higher than the other expressions. Although the Internet as a source of information is the most prominent source among students, it did not create a significant difference with other sources in terms of awareness. The study points out the importance of regional education strategies that take demographic differences into account to increase climate change awareness.

Keywords – Climate Change, Level Of Knowledge, Global Warming, T-Test, ANOVA.

I. INTRODUCTION

Climate change has emerged as one of the important problems affecting human and climatic systems today [1]. The increase in greenhouse gas emissions with the use of fossil fuels has led to global warming and caused problems such as environmental pollution [2]. For this reason, it is very important to raise public awareness about climate change in every field and for states to follow effective strategies on this issue [3].

The level of knowledge individuals has about the environment they live in and climate change, and the perceptions they develop depending on the environment they live in, are directly related to understanding this problem and taking actions to solve it [4]. However, when the studies on climate change in Turkey and the world in the past years were examined, it was concluded that students' awareness and knowledge levels on this issue were not high enough ([5],[6],[7]-[8]).This indicates that more strategic policies and

education plans need to be implemented to ensure that future generations have more comprehensive information about climate change and to increase their awareness [9].

It is envisaged that, especially in the development of studies on such issues, if practices are carried out more regionally or in medium-sized cities rather than nationwide, this will lead to a faster increase in people's awareness and awareness levels [10]. Due to these reasons, this study aims to determine the knowledge levels and awareness of university students at the regional level through different statistical methods and examine the impact of demographic variables on these variables. As a result, it is thought that this study will contribute to the creation of a society with a higher level of knowledge and the development of education policies in combating this issue by determining the behaviors of individuals regarding climate change at the university level.

II. MATERIALS AND METHOD

The aim of this study is to determine the knowledge level of university students about climate change and to make suggestions on educational strategies regarding the results obtained. In the study, a survey was used as a data collection tool to measure the knowledge levels of students studying in Isparta about climate change. The survey form includes questions such as their level of knowledge about climate change, where they obtained information about climate change, and why climate change occurs. This form consists of 6 demographic characteristics and 17 rating questions. The sample of the study was created with 400 students studying at Süleyman Demirel University in Isparta in the 2023-2024 academic year. The sample group was chosen so that the research leader could easily reach the students and collect data easily. The data collected from university students throughout the research were analyzed by applying t-test for gender variable and ANOVA methods for age, income, residence time, climate change statement and information source variables. In addition, the main hypotheses regarding the demographic and independent variables determined at the beginning of the study are as stated.

H_1: There is no statistically significant difference between men and women in terms of knowledge level.

H_2: There is no statistically significant difference in knowledge level between age groups.

H_3: There is no statistically significant difference between personal income level and knowledge level.

H_4: There is no statistically significant difference between the duration of residence and the level of knowledge.

H_5: There is no statistically significant difference in terms of climate change statement level of knowledge.

H_6: There is no statistically significant difference in terms of knowledge level of the information source level.

III. RESULTS

The findings regarding the variables used in the study and the t-test and ANOVA methods are shown in Table 1-6.

Table 1. T-test analysis results for Gender variable

Variable	Factor	Group	n	$\bar{x}$	Std.	p-value
Gender	Level of Knowledge	Male	198	3,35	0,673	0,010
		Female	202	3,12	0,685	

According to Table 1, since the p value was 0,01, it was concluded that there was a statistically significant difference between male and female students in terms of knowledge level awareness at the 95% confidence level. As a result, the average knowledge level of women was calculated as 3,35, while that of

men was calculated as 3,12. In other words, it can be said that women's knowledge level awareness is higher.

Table 2. ANOVA results for Gender variable

Variable	Factor	Group	n	$\bar{x}$	Std.	p-value
Age	Level of Knowledge	17-19	62	3,29	0,71	0,007
		20-22	129	3,39	0,67	
		23-25	138	3,11	0,66	
		26+	71	3,16	0,69	

According to the statistical results obtained as a result of ANOVA, the p value was found to be 0,007, and the H_0 hypothesis was rejected because the p-value was less than 0,05. There is a statistically significant difference between age groups in terms of knowledge level awareness at the 95% confidence level. As a result, the average knowledge level of 20-22 year olds is 3,39, which is higher than other age groups. In other words, it can be said that the knowledge level awareness of 20-22 year old students is higher.

Table 3. ANOVA results for Individual İncome variable

Variable	Factor	Group	n	$\bar{x}$	Std.	p-value
Individual Income	Level of Knowledge	3000 TL and under	80	3,14	0,72	0,018
		3001-5000 TL	121	3,26	0,58	
		5001-7000 TL	115	3,15	0,67	
		7001 TL and over	84	3,42	0,77	

When Figure 3 is examined, there is a significant difference in terms of knowledge level awareness across income levels, with a p-value of 0,018. However, the average knowledge level of students with a personal income of 7001 TL and above is 3,42, which is higher than other personal income groups. As a result, it is concluded that the knowledge level awareness of students with a personal income of 7001 TL and above is higher.

Table 4. ANOVA results for Residence Period variable

Variable	Factor	Group	n	$\bar{x}$	Std.	p-value
Residence Period	Level of Knowledge	0-1 year	102	3,44	0,68	0,000
		2-3 year	163	3,26	0,63	
		4+ year	135	3,05	0,70	

As a result of the ANOVA test, when the p-value was examined according to Table 4, it was observed that there was a statistically significant difference between the groups according to climate change knowledge, as it was less than 0,05. It has been determined that students with a residence period of 0-1 year have higher knowledge awareness.

Table 5. ANOVA results for Climate Change Expression variable

Variable	Factor	Group	n	$\bar{x}$	Std.	p-value
Climate Change Expression	Level of Knowledge	Global warming	69	3,66	0,78	0,000
		Drought	74	3,45	0,52	
		Occurrence of Excessive rainfall	69	3,15	0,55	
		Increase in Natural Disasters	88	3,07	0,59	
		İncrease in Greenhouse Gases	60	2,98	0,78	
		No Opinion	40	3,01	0,58	

When Table 5 was examined, the p value was found to be 0.000. Since the p-value between the climate change statement groups was less than <0.05, the H0 hypothesis was rejected. Therefore, as a result of the ANOVA test conducted for the climate change expression variable, it was determined that there was a statistically significant difference in terms of knowledge level. It can be said that the knowledge level awareness of the students who answered the statement of global warming is higher.

Table 6. ANOVA results for Residence Period variable

Variable	Factor	Group	n	$\bar{x}$	Std.	p-value
Source of Information	Level of Knowledge	Internet	107	3,67	0,67	0,000
		Television	112	3,28	0,54	
		Family and Friend Circle	120	2,97	0,61	
		Other	61	2,93	0,68	

As a result of the ANOVA test conducted for the source of information, it is seen that there is a statistically significant difference in terms of knowledge level. The average of internet information source was found to be 3,67, the average of television was 3,28, the average of family and friends circle was 2,97 and the average of other information source was 2,93. As a result, there is a significant difference between the internet information source and the other, such as television, family and friends. There is a significant difference between other sources of information and television, the internet, family and circle of friends. In other words, it can be said that the knowledge level awareness of the students who answered the internet statement is higher.

IV. CONCLUSION AND DISCUSSION

In this study, it was examined whether the awareness of Süleyman Demirel University students regarding the knowledge level of the climate change problem differs statistically in terms of variables such as gender, age, personal income, duration of residence, climate change expression, and source of information. According to the findings obtained as a result of statistical analysis of the relevant data, it is revealed that demographic factors have a significant impact on the level of climate change knowledge. The result that female students have higher knowledge levels than male students shows that these individuals are more concerned about the climate and the environment they live in. In addition, according to the age group variable, the fact that students in the 20-22 age group have a higher level of knowledge about the subject indicates that they may be more sensitive to climate change as the duration of their education at the university increases. According to personal income level, the higher level of knowledge and awareness of students in the income group of 7001 TL and above shows that the economic situation can have more

comprehensive and easy access to information about the environment they live in and may be more effective on environmental awareness. In terms of the duration of residence in the region, the fact that students residing for 0-1 year have a higher level of knowledge shows that they can improve themselves in this regard by being more exposed to new information in terms of short-term stay and change of environment. In addition, it was determined that the knowledge levels of students who used the expressions global warming and drought were higher than other groups. This shows that the awareness of students who realistically evaluate the climate change problem with its main causes is higher. However, although the Internet information source was the most popular platform, it did not provide a significant advantage in awareness compared to other sources. This actually shows that although the internet is very popular today, it can also lead to information pollution and misdirection. As a result, this study emphasizes the need to develop different and functional education policies to increase the climate change knowledge levels of university students. These policies can contribute to increasing the level of knowledge and creating a more conscious society by targeting different demographic groups, not just at the university level. However, studies to be carried out at the regional level will be an important step in raising awareness and spreading it to wider audiences.

ACKNOWLEDGMENT

In this study, 'chatGPT-4o' programs were used in the literature review section, and 'Google Translate' and 'DeepL Translate' programs were used for translation and grammar editing.

REFERENCES

[1] IPCC, *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge, U.K.: Cambridge University Press, 2021.
[2] J. Houghton, *Global Warming: The Complete Briefing*, 3rd ed. Cambridge, U.K.: Cambridge University Press, 2005.
[3] A. Leiserowitz, "Climate change risk perception and policy preferences: The role of affect, imagery, and values," *Climatic Change*, vol. 77, no. 1, pp. 45–72, 2006.
[4] R. E. O'Connor, R. J. Bord, and A. Fisher, "Risk perceptions, general environmental beliefs, and willingness to address climate change," *Risk Analysis*, vol. 19, no. 3, pp. 461–471, 1999.
[5] A. Atik and Y. Doğan, "Lise öğrencilerinin küresel iklim değişikliği hakkındaki görüşleri," *Academy Journal of Educational Sciences*, vol. 3, no. 1, pp. 84–100, 2019.
[6] G. Ataklı and H. Kuran, "Developing a scale for climate change awareness," *Biological Diversity and Conservation*, vol. 15, no. 2, pp. 150–161, 2022.
[7] A. Kılınç, E. Boyes, and M. Stanisstreet, "Turkish students' ideas about global warming: Causes, consequences, and control," *International Research in Geographical and Environmental Education*, vol. 20, no. 3, pp. 223–236, 2011.
[8] K. T. Stevenson, M. N. Peterson, and H. D. Bondell, "The influence of personal beliefs, friends, and family in building climate change concern among adolescents," *Environmental Education Research*, vol. 22, no. 1, pp. 46–60, 2014.
[9] E. C. Cordero, A. M. Todd, and D. Abellera, "Climate change education and the ecological footprint," *Bulletin of the American Meteorological Society*, vol. 89, no. 6, pp. 865–872, 2008.
[10] K. S. Fielding and B. W. Head, "Determinants of young Australians' environmental actions: The role of responsibility attributions, locus of control, and social norms," *Environmental Education Research*, vol. 18, no. 2, pp. 171–186, 2012.