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Message from the Editor-in-Chief

Dear Colleagues,

We are very pleased to publish Special Issue 3 for INTE 2015 conference. This issue covers the papers presented at 6th International New Horizons in Education Conference which was held in Barcelona, Spain. These papers are about different research scopes and approaches of new developments and innovation in education.

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September, 2015
Prof. Dr. Aytekin ISMAN
Sakarya University

Editorial Board

Determınatıon Of The Knowledge Levels Of Students Studyıng At The Health Related Departments About Renewable Energy Resources And Protectıon Of The Envıronment

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ABSTRACT
This study was conducted in order to determine the knowledge and awareness levels of students who studied the elective subject of environmental ethics at the Vocational School of Health Services (AVSHS) in Aydın, Turkey. The results of 172 students' questionnaire showed that the students did not have sufficient knowledge about renewable energy, renewable energy recourses, the Kyoto protocol and whether the resources used to produce energy at present cause to the release of greenhouse gases or not.

Key words: Renewable energy sources, environmental awareness, environment and energy knowledge, Kyoto protocol

INTRODUCTION

Environmental problems are among the most discussed matters which consider whole people and waiting to be solved. Ecosystem is a functional and renewable community of living organisms in conjunction with the nonliving components of their environment and an interacting system by means of transferring materials and energy.

Increasing population numbers in Turkey and in the world, industrialization, transition to the city life and desire to have more comfortable and luxurious life increase the demand for energy and natural resources. Traditional energy resources, fossil fuels which have negative effects like global warming and air pollution, have a big portion in supplying this demand. Use of excessive energy brings along some problems, particularly excessive use of limited resources of the World and damages given to the environment during the production of energy are on the top of the list (Kaygusuz, 2002).Increasing the awareness and knowledge of people and taking measures in these matters is considered as an important step towards solving the problems. Therefore, there has been an increase in the numbers of studies in terms of generating environmental awareness and protection of environment in people especially young ones (Bradley, Waliczek & Zajıcek, 1999, Töman & Çimer, 2013, Yurtseven, et al. 2010). If communities and individuals are not made aware about energy, even we provide much more new and different resources, it is a fact that it will be insufficient considering the increasing population and industrialization rates. But, when the awareness level of consumers increase, their positive attitudes towards environment also increase (Bradley, et al., 1999).The success of energy policies are evaluated based on the criteria that whether the demands towards the present and future requirements of community are provided widely in benefit of community without damaging environment and accepted by community (Ediger & Kentmen, 2010).

In recent years, reducing environmental problems to minimum (especially global warming) has become important to leave a better world for future generations. In this context, there has been a big effort to develop alternative technologies and resources, and to increase their use instead of intensively used energy production methods from fossil resources in the last two centuries. When we looked at the previous studies related to renewable energy and renewable energy sources mostly have been carried out in the areas such as engineering and economics. These studies were carried out to determine the awareness of individuals about energy or the attitudes of individuals towards a certain type of energy (Kaygusuz, 2002; Kaldellis, 2005; Kaya, 2006; Swofford & Salttery, 2010; Fırat, Sepetçioğlu & Kiraz, 2012). In the previous literature in education area, issues such as environmental awareness, pollution, protection of environment and education on environment have been studied (Jınlıang & et al. 2004; Alım, 2006; Tunç, Ömür & Düren, 2012; Özdemir, 2010; Aydın, 2010; Doğan, 2013).

There have not been many researches on the training of subject and determining the knowledge level of individuals (Töman & Çimer, 2013; Yücel, 2007). Knowledge plays an important role in developing individual positive attitudes towards their environment and new technologies as in many matters (Uzun & Sağlam, 2007; Özcan, 2010). Therefore, this study was performed to determine whether the students studying in the field of health sciences at the vocational high school have the sufficient knowledge about environmental issues, renewable energy, and global partnerships in terms of protection of environment.

In this study, answers were sought for the questions below:
1. Do the students know what the renewable energy is and what the renewable energy resources are?

2. Do the students know the difference between the renewable energy resources and fossil fuels used intensively at present in terms of environmental effects?
3. Do the students have any information about global (international) protocols or treaties like Kyoto protocol aiming the protection of environment?

MATERIAL AND METHOD

This study is a descriptive survey case study. Questionnaire consisted of five close-ended questions on demographic features and six close-ended and one open-ended seven questions on research subject.

The questionnaire consisted of two parts; the questions in first part assessed the demographics of the students. The knowledge of students related to environment, protection of environment, energy and renewable energy types were assessed with the questions in the second part.

Study Group

The study group was the students of Adnan Menderes University (ADU), Aydın, Turkey, and the study samples were students, at the Aydın Vocational School of Health Services (AVSHS), who took the elective subject of environmental ethics students during 2012-2013 and 2013-2014 academic years.

Data Analysis

The answers given to the questions in the survey were transferred to the Statistical Package for the Social Sciences (SPSS) program, and below analyses were realized.

Sex, education program (P)/department (D), whether they took any course about environment or not, whether they read any book about environment. The answers they gave for how much they were interested in the environmental news in the printed and visual media and to the questions about renewable energy were determined for the participants.

One-Way ANOVA was used to determine whether there was a correlation between demographic and study issue data. The significant level was $p < .05$.

Demographic Features of Participants

D/ P distribution of the students who participated the survey is shown in Table 1.

Table 1: P/D distribution of students who participated the survey.

Program / Department	**n**
Environmental Health Program (EHP)	41
Physiotherapy Program (FTRP)	16
Medical Secretarial and Documentation Program (MSDP)	31
First Aid and Emergency Program (FAEP)	8
Medical Laboratory and Techniques Program (MLTP)	25
Dialysis Program (DP)	13
Medical Imaging Techniques Program (MITP)	13
Anesthesia Program (AP)	3
Nursing Department (ND)	3
Midwifery Department (MD)	2
4 Year Degree Departments(4YD)	14
Various Vocational Schools (VVS)	3
Total	**172**

The numbers of students who taken any lesson/course about the environment before were 68 (39.8%), not taken were 103 (60.2%), and one of the participant did not answer this question.

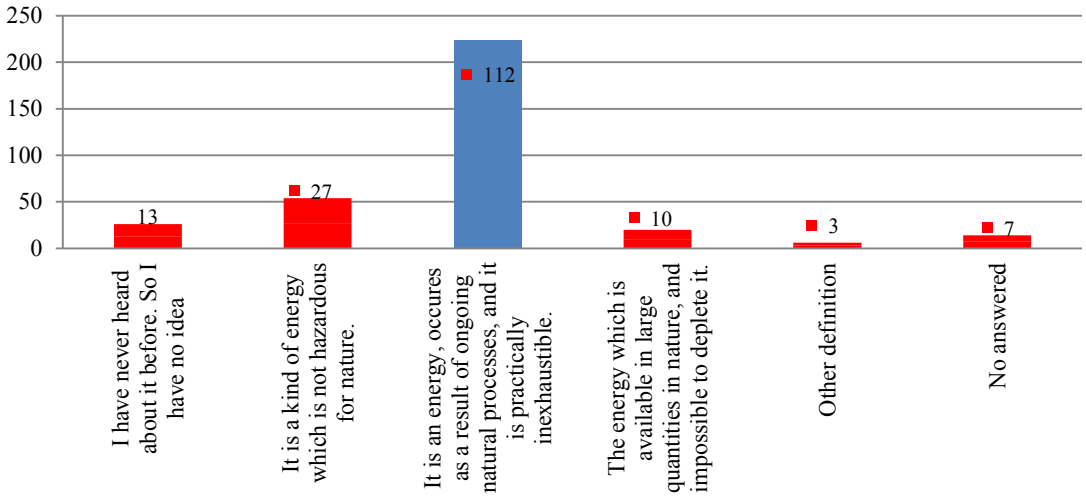
The numbers of students who read any book about environment were 97 (56.7%), who didn't read were 74 (43.3%) and one of the participants did not answer it.

When we looked at the answers that given to the question of "When you read or watch one of the printed or visual media products (newspaper, magazines, internet, TV, etc.) how much attention do you pay to the news about

environment?" Only one quarter of participants (n:44; 25.6%) have stated that "in daily life, I put into practice things which I hear or read." Ninety one of participants (52.9%) stated that "I just read", thirteen (7.6%) of them said that "I am usually not aware of this kind of news", twenty four (14%) of them said that "I see but I am not interested in".

FINDINGS

First question related to research issue was close-ended definition of renewable energy. When we looked at the given answers related to the definition of renewable energy, correct alternative was marked by 112 (65.1%) students, while thirteen students (7.6%) stated having no idea because they did not hear about it before. Twenty seven students (25.7%) marked as harmless energy and ten students (5.8%) chose the definition of lasting energy meaning it is available in huge amounts in nature so it is unlikely to deplete it. Three students (1.7%) gave different definitions (Figure 1).

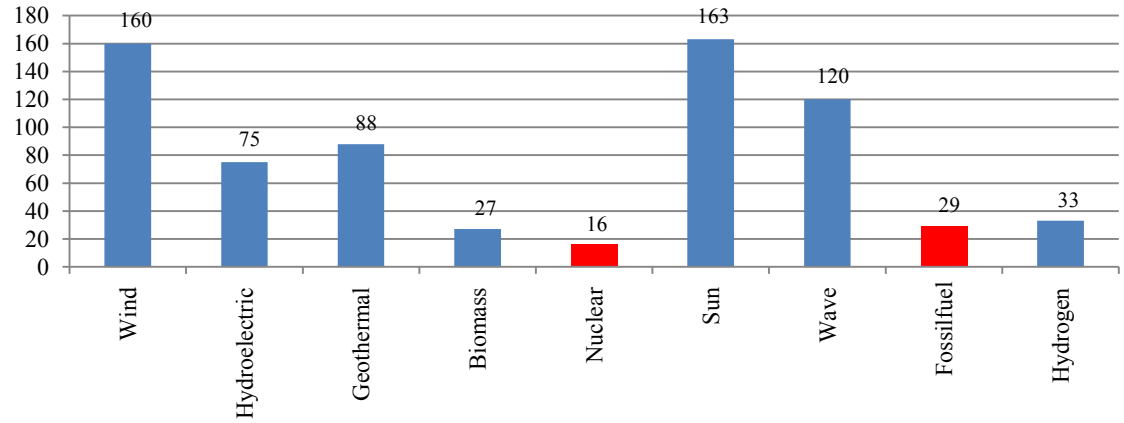


The labeled blue column shows the correct answer.

Figure 1: Answers given to the question of "Which is the correct definition of renewable energy?"

There were no significant differences in relation to P/D, whether or not students took course and whether or not students pay attention to news. There was a significant difference in relation to students read any book about environment ($p < .05$).

Next question was "choose from the following energy types which are the renewable". When we looked at the frequencies, the most marked energy types were respectively solar (n:164), wind (n:161), wave (n:120) and geothermal (n:89) energy. The least known forms of energy were biomass (n:27) and hydrogen (n:33). On the other hand, nuclear energy (n:16) and fossil fuels (n:29) have been known incorrectly as renewable by some students (Figure 2).



* *The labeled red columns show the false answers.*

Figure 2: Answers given to the question of "Which energy types are renewable?"

Following this question, there was a list including the names of some energy resources that are used and unused as renewable. Considering the responses, the best known renewable energy resources were solar, wind, hot air stream and rivers respectively similar with the answers of the previous question (Figure 3).

The description of Kyoto protocol, an international agreement linked to the United Nations Framework Convention on Global Climate Change, was asked in order to learn whether the students know it or not. Approximately half of them (42.77%) chose the option "I have never heard it before." Only 4.22% of students chose the option "I know and I can define correctly" (Figure 4). 31.93% of them had heard it before, but stated that they did not have any idea about what it was. There was a significant difference between whether they studied any subject before on environment or not. In terms of studied subject, there was a significant difference between EHP and FTRP, MSDP, FAEP, MLTP. Based on whether they take notice of the warnings, there was a significant difference between the students who marked "I do not usually take notice" option and students who marked "I put into practice things I read or hear" option ($p < .05$).

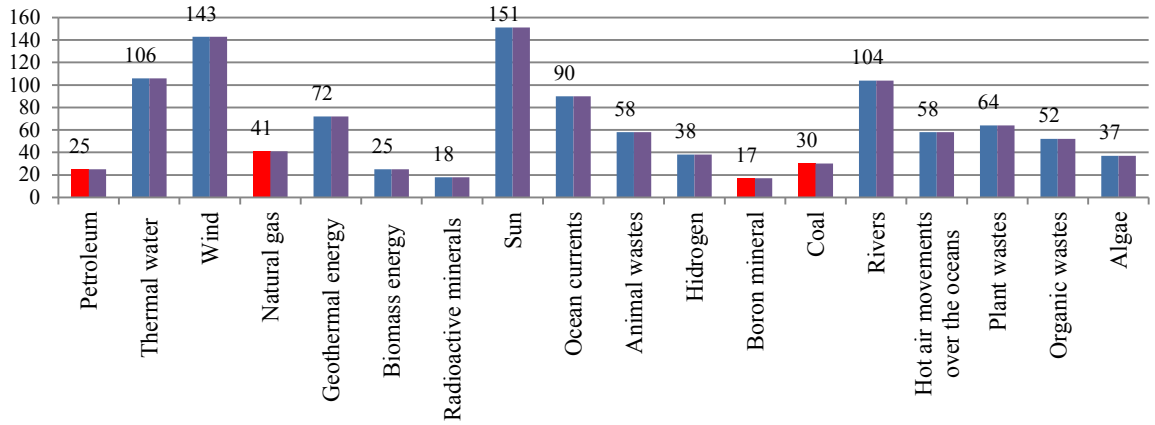


Figure 3: Answers of the question of "in your opinion: which are the products that used to be renewable energy resources the following list?"

There was no significant difference regarding whether they read any book or not ($p > .05$).

Second question in relation to the Kyoto protocol was "Is our country a member of the Kyoto protocol?" 60.82% of the students marked the option "I have no idea". This result is in parallel to the answers of previous question.

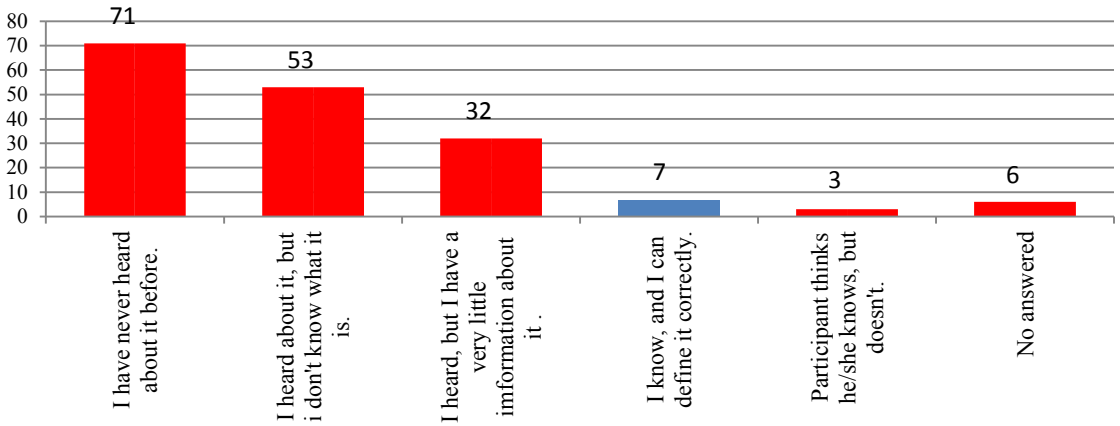


Figure 4: Answers given to the question of "What does it come to your mind when the Kyoto Protocol mentioned?"

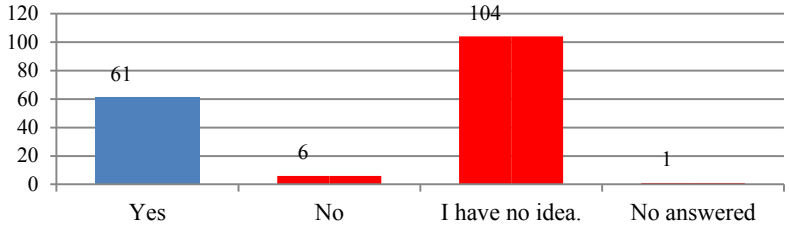
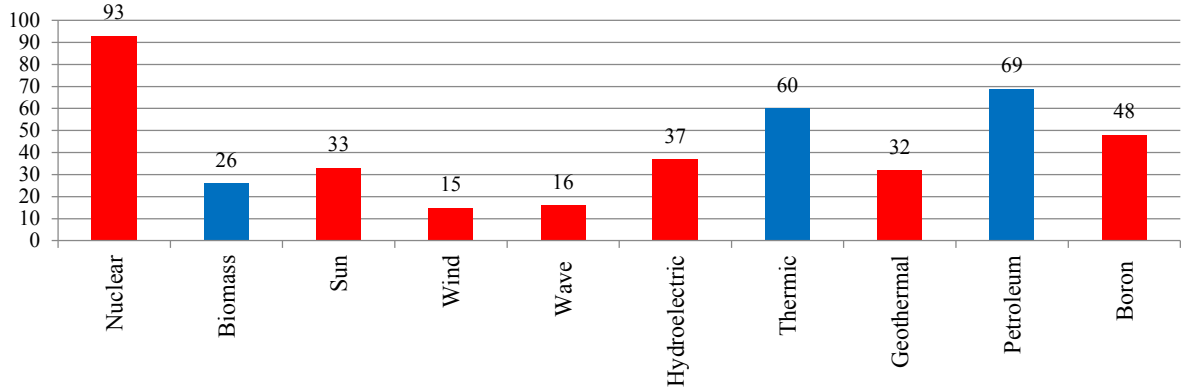


Figure 5: Answer given to the question of "Is Turkey a member of the Kyoto Protocol?

One third (35.67%) participants know that Turkey is a member of the Kyoto protocol, and marked correct option (Figure 5). In terms of subject studied, there was a significant difference between EHP and FTRP, MSDP, FAEP, DP. Also there was a significant difference in relation to whether they studied any subject about environment before or not, whether they read any book about environment or not, and taking notice of warnings, between who marked the option of 'I do not usually realize' and who marked other options ($p < .05$).

By giving the names of some energy resources and energy types in 6th question, it was asked "which does cause to the greenhouse gas emission?". When the answers were evaluated, it was seen that students had false information about the emission of fuels. The number of students who knew that greenhouse gas emission is caused by carbon-based fuels such as biomass, oil and thermal energy was very low. Many of students had a wrong thoughts of which fuels such as nuclear (n:93), boron (n:48), hydroelectric energy (n:37), sun (n:33), etc. cause the greenhouse gas emission (Figure 6).



* *The labeled red columns show the false answers*.

Figure 6: Answers of the question of "Which following fuels or energy types are the causes of the greenhouse gas emission?"

The final question was open-ended, and students were asked to define some key concepts such as emission, energy agriculture (enagri), alternative energy, green-energy and solar cell related to renewable energy and environment. When the answers were examined, it was seen that most of the students did not answer the concepts especially enagri, green energy and emission. Also, most of the answers were wrong. The most frequent correctly defined concept was "Alternative Energy" (Figure 7). There was only a significant difference in relation to the definition of solar cell in favor of who read a book ($p < .05$).

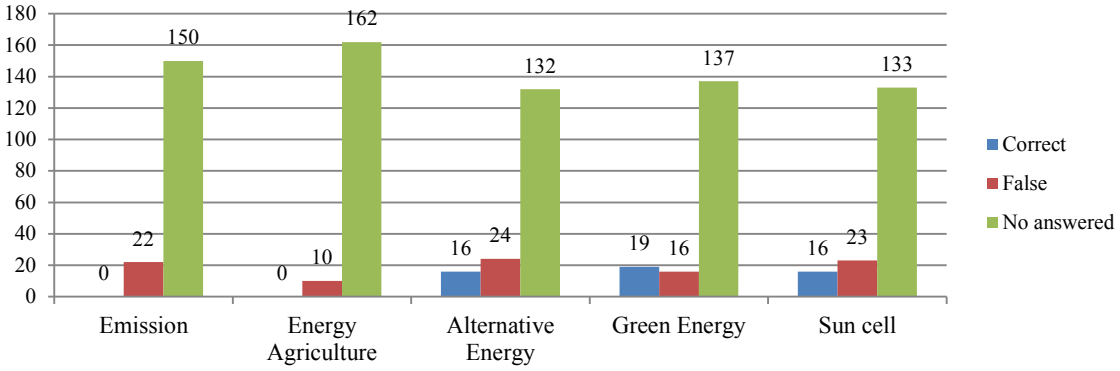


Figure 7: Shows the defining distributions of some key concepts related to energy and environment.

CONCLUSIONS

An ecosystem is a natural system consisting of all plants, animals and microorganisms (biotic factors) in an area functioning together with all the non-living physical (abiotic) factors of the environment (Christopherson, 1997). While creatures are shaped by the physical and chemical conditions of the ecosystem, they affect and change the conditions of their environment. Considering the energy needs and energy utilization of humankind, reducing the occurrence of pollution due to energy production from fossil fuels will contribute to the protection of environment. Increasing the knowledge level of consumers about environment and renewable energy is one of the important factors.

According to the results of this study, it was determined that students did not have sufficient knowledge about what renewable energy was, which resources in nature could be used as a source of renewable energy, and about the topics like which energy resource during the energy producing process could cause greenhouse effect. Furthermore, they had wrong information. One of the most important reason of this situation is environmental issues are not adequately integrated at the primary and secondary education level in our country. When the contents of science and social subjects related to environment at the primary and secondary school levels were observed, it was seen that such topics about the importance of energy resources and renewable energy in the biology, chemistry and geography lessons are very short (usually 1-2 hours) (MEB, 2005 and MEB, 2013).

Sun, wind, geothermal and rivers have been stated to be the most known renewable energy resources. The reason for this, they are frequently encountered around us. On the other hand, petrol (4.5%), natural gas (23.8%), boron (10%) and coal (17.4%) were marked as renewable energy resource by the students who had wrong information about these fuels.

It was observed that only 4% of the students knew about the Kyoto Protocol which was constituted in the aim of taking precautions against the threat of global warming that the earth will face near future, 41% of the students did not hear about it and other 50% of the students did not have sufficient and right information. Yılmaz, et al. (2002), reported that education provided about environment is insufficient, and especially students studied chemistry at the secondary school have a bit more information about the topic. These statements are in accordance with our findings and support our results. On the other hand, when the curriculums of the Ministry of National Education (MNE) were investigated, it was observed that the Kyoto Protocol was not included in the year 2013 (MEB, 2013) and it was only one hour subject in the 10th year chemistry syllabus(MEB, 2005) and the students gain their knowledge about environment through printed or visual media. Also, most of the students (64%) didn't know that Turkey is a member of the Kyoto Protocol. This topic has been situated in the last lesson of the 12th grade course of The Contemporary History of Turkey and World in 2008 (MEB 2008). Students, if do not study in relation to environment or in the area of environment, they do not get sufficient education about environment (Çabuk & Karacaoğlu, 2003). In this study, the answers given by the students studying at the EHP in relation to the environment were significantly different comparing to the answers of students studying at the FTRP, MSDP, FAEP, DP programs which do not include subjects related to environment.

The students were given a list of several names of energy resources used at present and were asked which ones were likely to cause to greenhouse gas emission, and majority of the answers were wrong. It was observed that most of the participants had misinformation about nuclear, boron, hydroelectric, geothermal, wind, and the sun which are not the cause of greenhouse gas emission. Topics related to energy resources, are available in the biology and physics subjects at 9th grade, and more widely in the chemistry subject syllabus of 10th grade (MEB, 2013).

But, according to the secondary school education curriculum structure, students, except ones studying in science and math area, there is no the lessons which are physics, chemistry and biology in curriculum of the social sciences departments later than 9th grade. Also, because of the topics being not linked between the subjects, it can lead to the insufficient learning or wrong-learning of students. In the literature, a strong attitude towards environment is associated with the education provided at school (Kumar & Patil, 2007 as cited in Tunç, et al. 2012).

In an open-ended question in the survey, the participants were asked to define some terms related to renewable energy such as emission, alternative energy, green energy, and solar cell. It was observed that 70-80% of the participants did not answer. The best known terms by the students were green energy (11%), alternative energy (9.3%) and solar cell (9.3%). It was notable that these terms were defined correctly by in small numbers of the students and these were mostly EHP students (green energy 9/19; alternative energy 8/16; sun cell 10/16). The reason of low correct answer numbers of 8-10 out of 41 EHP students is likely because the environmental ethics subject is thought in the first term of first year and the questionnaire was performed at the beginning of the first term; therefore the EHP students had not studied their major subjects. But, there are also some students coming from the environmental health division from high schools of health sciences thus this difference arises from the students who studied subjects related to environment at the high school level.

When we evaluate the data and consider the global needs, in my opinion it is beneficial to provide more hours of education about renewable energy topic in the curriculums of MNE for high schools. The content of topics should be revised according to present circumstances and during the university education, elective subjects about environment, energy and energy resources should be available. Encouraging students to take these subjects may help to make public aware of these issues.

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