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ATTITUDES AND BEHAVIORS OF THE UNIVERSITY STUDENTS WITH DIFFERENT NATIONALITIES TOWARDS THE USE OF RENEWABLE ENERGY

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ABSTRACT

One of the most significant existing environmental problems is the insufficiency of energy produced in the world to meet our energy demand. The renewable energy (RE) resources have become more critical since the majority of the required energy is provided through fossil fuel resources and such resources are exhaustible. The improvement in the availability of RE resources is possible through effective environmental education to the students, who are the future users of such resources. Within the scope of this study, a scale was applied to identify the attitudes and behaviors of university students with different nationalities on the use of renewable energy. The questionnaire used in this research was applied to 500 students of different nationalities, who are studying at the universities located in the northern part of Cyprus in 2015-2016. Multiple basic to specific queries are asked to learn their knowledge, perceptions, attitudes, and behaviors towards RE. The Crosstabs analysis to evaluate the impact on variables. Findings indicate that students from many countries with major resources of fossil fuels, there is a significant need for education for students regarding the necessity of using renewable and green energies. The results showed that Egypt education was more knowledgeable of the uses and the nature of RE technologies.

1. INTRODUCTION

Energy is a fundamental component of the universe and is one of the forms of existence. Energy is derived mainly from natural sources and other non-natural sources so it is divided into two main types, namely: renewable energy, which depends on natural resources, and non-renewable energy,

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and rely on non-natural sources, but it was formed over time and under the influence of a combination of several factors. All kinds of energy required the existence of mechanisms, tools, techniques and harnessed for the benefit of man (GTREI, 2016).

Renewable energy is defined as energy that is collected from resources which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energy often provides energy in four areas: electricity generation, air, and water heating/cooling, transportation, and rural (off-grid) energy services. Renewable energy resources exist over broad geographical areas, in contrast to other energy sources, which are concentrated in a limited number of countries. Rapid deployment of renewable energy and climate change mitigation, and economic benefits (GTREI, 2016).The conviction of the need for new energy sources has increased not only from the premise that fossil fuels have begun running out, but also if the traditional sources of energy remained at current levels they are not enough to meet human needs years to come (Nyboer, 2009, 2011).

Climate change is a long-term shift in weather conditions identified by changes in temperature, precipitation, winds, and other indicators. It can involve changes in energy sources. In this regard, renewable energy is one of the most important solutions to climate change. It can contribute to cleaner air as renewable energy produces not only a little or no greenhouse gas emissions but also other air pollutant emissions which cause smog, acid-rain or hazardous air pollution are zero for most forms of renewable energy. When low-emitting forms of renewable energy are used to replace fossil-fuel energy, reductions in air pollution occur resulting in cleaner air (Nyboer, 2009, 2011).

Research studies demonstrate that society does not have sufficient information about renewable energy usage; resulting from a lack of sufficient for renewable energy sources and the lack of importance given to this subject in the school curriculum. Moreover, it has been found research that the level of knowledge about renewable energy resources and their use is at a theoretical level and remains practically insufficient (Karabulut *et al.*, 2011). Therefore our study is important in highlighting the significance of renewable energy use, revealing the current behaviors of university students on this subject and bringing solutions to current problems by revealing the factors affecting behaviors (Erol *et al.*, 2006). In this research, an answer was sought to the question of "how are the behaviors of university students towards renewable energy use?" Factors of university student behaviors towards renewable energy use were intended to be determined around this basis.

2. RESEARCH MODEL

The study conducted to determine the attitudes and behaviors of the students from different nationalities towards the use of renewable energy using the "scan model." Scan research was conducted with the aim to gather data about significant aspects.

3. DATA GATHERING TOOL

In this research, the "Personal Information" and "Behaviour of University Student towards the Usage of Renewable Energy" were used as a data gathering tool. As far as data collection tools were concerned, the conduct of the research involved the use of a semi-structured questionnaire, which

was a guide for the research. Specific research questions were prepared so that the researcher could guide the interview towards the satisfaction of research objectives.

3.1 QUESTIONNAIRE

The levels of knowledge of the university students participating in this study about the behavior of University Students towards the usage of renewable energy were determined and interpreted by using the survey questions.

3.2 PARTICIPANTS AND SAMPLE

The population of the study comprises of university students of different nationalities. The sample of this study comprises of 500 students studying in the universities of Northern Cyprus in the 2015-2016 academic year.

3.3 DATA ANALYSIS

The data obtained from the surveys were evaluated in a computer environment by using the SPSS 20.0 software. While determining the awareness level change by gender about the behavior and attitude of the University Students who participated in this study, the independent t-test was used, and while determining the behavior towards renewable energy background, the Crosstabs test was used.

4. FINDINGS

In this research, a study of the question of "how are the behaviors of university students towards renewable energy use?" was performed. Factors of university student behaviors towards renewable energy use were intended to be determined around this basis. In this context, the formed demographic features, problem sentences, and sub-problems have been presented below.

Table 1: Distribution of Sample by Gender.

Gender	f	%
Male	262	52.4
Female	238	47.6
Total	500	100.0

Table 2: Distribution of Sample by Age

Age	f	%
18-22	128	25.6
22-26	97	19.4
26-30	74	14.8
30 and above	201	40.2
Total	500	100.0

As seen in Table 1, 500 people participated in the research and 47.6% of the participants were female and 52.4% were male. Regarding the distribution of the sample by gender, we can see that males were more than females.

From Table 2, it is possible to see that 25.6% of the students forming the sample of this research were at the age range 18-22, 19.4% were the range 22-26, 14.8% were at the range 26-30, and 40.2% were 30 and above. In the distribution of the sample by age, it is possible to see that students at the age of 30 and above are higher in number than the other age ranges.

In Table 3, it is possible to see that 5,8% of the students were from Bangladesh, 12,2% were from Libya, 13,2% were from Egypt, 22,6% were from Nigeria, 6,8% were from India, 14,6% were from Syria, 9,2% were from Pakistan and 15,6% were from other different ethnic groups.

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Table 3: Distribution of Sample by Ethnic Groups.

Ethnic Background	f	%
Bangladeshi	29	5.8
Libyan	61	12.2
Egyptian	66	13.2
Nigerian	113	22.6
Indian	34	6.8
Syrian	73	14.6
Pakistani	46	9.2
Other	78	15.6
Total	500	100.0

Table 4: Distribution of Sample by Average Monthly Income.

Income (USD)	f	%
Under 10,000	324	64,8
10,000-$20,000	176	35.2
Total	500	100.0

As seen in Table 4, 64.8% of the families earn less than 10.000 dollars, 35.2% earn between 10,000-20,000 dollars. In the distribution of the sample, the monthly income of 64.8% the families was seen to be at most 10,000 dollars and between 10,000-20,000 dollars for 35.2% of the families.

In this research, factors of university student behaviors towards renewable energy use were intended to be determined. In this context, the answers from multiple queries are presented below.

4.1 UNIVERSITY STUDENTS' RESPONSE TO MULTIPLE QUERIES

4.1.1 OPINIONS TOWARDS THE EFFECT OF ENERGY TYPES ON THE ENVIRONMENT

For the query: **How are the views of university students towards the effect of energy types on the environment?**

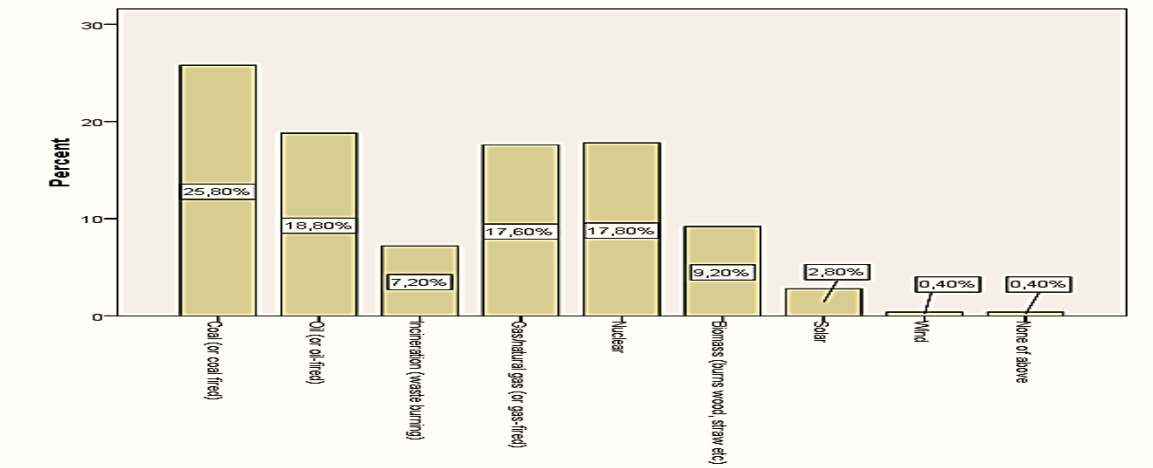

Figure 1: Views of University Students towards the Effect of Energy Types on the Environment.

As seen in Figure 1, university students state that the effect of renewable energy resources on the environment is at a low level (solar 2.8%; wind 0.4%). Also, the students state that the fuel that affects the environment the most is coal (25.8%).

4.1.2 OPINIONS TOWARDS RENEWABLE ENERGY

For the query: **How are the views of university students towards renewable energy?** As seen in Table 5, it has been determined that solar energy is seen as the most likely renewable energy source to replace fossil fuels by the students (68.2%). This is also followed by wind energy (63.4%).

Table 5: Distribution of answers to the question, "Do you agree that energy generated from the following resources can replace the use of fossil fuels."

	Wind Energy		Solar Energy		Wood Fuel	
	f	%	f	%	f	%
Agree	317	63.4	341	68.2	200	40.0
Disagree	82	16.4	76	15.2	130	26.0
Don't know	101	20.2	83	16.6	170	34.0
Total	500	100.0	500	100.0	500	100.0

Table 6: Distribution of answers to the question: "Do you feel that you need more information about renewable energy."

	f	%
Yes	448	89.6
No	52	10.4
Total	500	100.0

As seen in Table 6. students believed that they are in need of more information on renewable energy sourced (89.6%). Crosstabs analysis has been performed to find out the distribution of findings among nationalities. The findings are presented in the distribution Table 7.

Table 7: Distribution of answers to the question, "Information need of university students regarding renewable energy."

Ethnic Background	Yes		No		Total	
	f	%	f	%	f	%
Bangladeshi	25	86.2	4	13.8	29	100
Libyan	56	91.8	5	8.2	61	100
Egyptian	63	95.5	3	4.5	66	100
Nigerian	92	81.4	21	18.6	113	100
Indian	31	91.2	3	8.8	34	100
Syrian	65	89.0	8	11.0	73	100
Pakistani	39	84.8	7	15.2	46	100
Other	77	98.7	1	1.3	78	100

In Table 7, it is seen that the information need regarding renewable energy is majorly seen in Egyptian (95%) students and other countries (98.7%). It is followed by Libyan (91.8%) and Indian (91.2%) students respectively. The least need for information was observed in Pakistani (84.8%) students, even though the percentage of need was still high.

In Table 8, it is seen that 62.4% of students gave positive answers towards increasing renewable energy uses. Crosstabs analysis has been performed to find out the distribution of finding among nationalities. The findings in Table 9 shown student views on the increased necessity of renewable energy use is shown. Egyptian students (86.4%) followed by the Syrian students (80%) had the highest frequency of positive answers, stating that this energy type should be used.

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Table 8: Distribution of answers to the question: "Do you think that we should increase the use of renewable energy?"

Answer	f	%
Yes	312	62.4
No	67	13.4
Don't know	121	24.2
Total	500	100.0

Table 9: Distribution of the student views on the necessity of increased renewable energy uses.

Ethnic Background	Yes		No		Total	
	f	%	f	%	f	%
Bangladeshi	14	48.3	6	20.7	29	100
Libyan	35	57.4	14	23.0	61	100
Egyptian	57	86.4	3	4.5	66	100
Nigerian	57	50.4	27	23.9	113	100
Indian	9	26.5	4	11.8	34	100
Syrian	59	80.8	4	5.5	73	100
Pakistani	17	37.0	8	17.4	46	100
Other	64	82.1	1	1.3	78	100

Table 10: Distribution of answers to the question, "Who do you think should take the major responsibility for increasing our use of renewable energy?".

Answer	f	%
National Government	154	30.8
Government Office	113	22.6
Reading Borough Council	78	15.6
Private businesses	64	12.8
People like you	91	18.2
Total	500	100.0

Table 11: Distribution of answers to the question, "Who do you think should take the major responsibility for increasing the use of renewable energy?"

Ethnic Background	National Government		Government Office of the South East		Reading Borough Council		Private businesses		People like you		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Bangladeshi	5	17.2	6	20.7	5	17.2	7	24.2	6	20.7	29	100
Libyan	15	24.6	12	19.7	12	19.7	5	8.2	17	27.9	61	100
Egyptian	29	43.9	12	18.2	16	24.2	1	1.5	8	12.1	66	100
Nigerian	30	26.5	31	27.4	8	7.1	17	15.0	27	23.9	113	100
Indian	25	34.2	10	13.7	18	24.7	9	12.3	11	15.1	34	100
Syrian	10	21.7	8	17.4	5	10.9	9	19.6	14	30.4	73	100
Pakistani	29	37.2	14	34.5	14	17.9	2	25.6	1	1	46	100
Other	14	48.3	10	17.9	3	10.3	20	6.9	0	0	78	100

As seen in Table 10, students state that the highest responsibility in increasing renewable energy use is on the national governments (30.8%). Crosstabs analysis has been performed to find out the distribution of findings. The findings Table 11, it is seen that Bangladeshi students (48.3%) agree mostly about the issue that the highest responsibility in increasing renewable energy use is on the national governments. This is followed by Egypt (43.9%) and Syrian (34%) students.

Table 12, the most frequent renewable energy type that students use at home is solar hot water heating (40.4%), followed by wood-burning stoves and fireplaces (21.8%). Crosstabs analysis has been performed to find out the distribution of findings among nationalities. The findings in Table 13, solar hot water heating is the renewable energy type mostly used by Libyan students, followed by

Nigerian students (43.4%). It is also observed that photovoltaic (PV) solar cells are used mostly by Indian students (47%).

Table 12: Are you aware that government grants to help you to invest in renewable energy such as solar panels, small wind turbines, and wood-fired boiler systems?

Answer	f	%
Solar panels/PV	97	19.4
Solar hot water heating	202	40.4
A wood-burning stove/fireplace	109	21.8
None of the above	92	18.4
Total	500	100.0

Table 13: Distribution of answers to "What is a renewable energy source most widely used?"

Ethnic Background	Solar cell panels/PV		Solar hot water heating		A wood-burning stove/fireplace		Other		Total	
	f	%	f	%	f	%	f	%	f	%
Bangladeshi	7	24.1	17	58.6	5	17.3	0	0	29	100
Libyan	7	11.5	40	65.6	9	14.8	5	13.6	61	100
Egyptian	18	27.3	14	21.2	25	37.9	9	47.8	66	100
Nigerian	4	3.5	49	43.4	6	5.3	54	11.8	113	100
Indian	16	47.1	5	14.7	9	26.5	4	6.8	34	100
Syrian	6	8.2	24	32.9	38	52.1	5	26.1	73	100
Pakistani	13	28.3	16	34.8	5	10.9	12	3.8	46	100
Other	22	28.2	43	55.1	10	12.8	7	3.9	78	100

Table14: Are you aware of government grants to help you to invest in renewable energy such as solar panels, small wind turbines, wood-fired boiler systems?

Answer	f	%
Yes	225	45.0
No	275	55.0
Total	500	100.0

Table15: Distribution of answers to the question. "The awareness rate of the government support for renewable energy sources that students can use in their living environment.

Ethnic Background	Yes		No		Total	
	f	%	f	%	f	%
Bangladeshi	12	41.4	17	58.6	29	100
Libyan	30	49.2	31	50.8	61	100
Egyptian	21	31.8	45	68.2	66	100
Nigerian	64	56.6	49	43.4	113	100
Indian	16	47.1	18	52.9	34	100
Syrian	33	45.2	40	54.8	73	100
Pakistani	20	43.5	26	56.5	46	100
Other	29	37.2	49	62.8	78	100

As seen in Table 14, upon analyzing whether the students are aware that the government supports the use of renewable energy sources within their living environment; it is observed that 55% of students are not aware of any support. Crosstabs analysis has been performed to find out the distribution of findings among nationalities. The findings Table 15, students can get support in their living environment that Nigerian students (56.6%) seem to be the first followed by Libyan students (49.2%) while Egyptian students were found to be the least aware (31.8%).

Of the participants 52.4% were male. and 47.6% were female. Furthermore. 25.6% were between 18-22 years old, 19.4% between 22-26 years, 14.8% falls in the range 26-30 years age group

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and 40.2% are in the 30 and more year age group. This shows that the majority of the students that took in the survey are 30 and more years old. The distribution of returned surveys by ethnic groups as described in Table 4, the majority of the respondents were from Nigeria (22.6%), next others (15.6%) and the smallest ethnic group was Bangladeshi with 5.8%. According to the students' opinions, the fuel types that affect the environment the most is coal at 25.8% and oil (18.8%). Others research studies about renewable energy support these results such as Liarakou et al. (2009). Furthermore, in analysing the ethnic background of the respondents in relation to the necessity for more usage of renewable energy, it was discovered that Egyptian students showed the highest positive response with 86.4% and second highest by Syrian students with 80.8% with the exclusion of others and the lowest positive response was from the students Indian students. The students answered the question "who do you think should take the major responsibility for increasing our use of renewable energy?" with the following results. National governments carried the responsibility of 30.8% to the respondents. and South East government office was seen as the second responsible with 22.6%. The last to take responsibility according to the respondents are private businesses with only 12.8% with regards to ethnic backgrounds. Bangladeshi with 48.3% agreed that the National Government should take responsibility and was followed by Egypt with 43.9% and last India with just 5.9% for National government to take responsibility but 47.1% thought government office of the South East should take responsibility. The analyses on whether the students possess some of the renewable energy resources at home. 40.4% of the respondents said they have solar hot water heating. 19.4% said they have solar panels/PV, while others said they have wood burning stove/fireplace and others said they do not have any of above at home. Work by Fırat (2012) supports this (Fırat, 2012).

This study also aimed to find if the respondents do plan to install any renewable energy technology at home. From the results, many respondents said they would not like to install any because they think the installation would be too expensive (20%). This was followed by the reason that they are noisy with 16.6%. Analyses of the reason why students from different ethnic backgrounds do not want renewable energy resource to show that 24.7% students from Bangladesh said renewable energy resources would not produce enough electricity to power their homes while 32.8% from Libya said it is too expensive to install. The students from Nigeria (38.9%) said they are too noisy and would not like to install them while 23.5% from India also said they do not understand how it works. Syria (19.2%) and Pakistan with and (19.6%) said they are not attractive and installation is too expensive respectively. Some research studies support this result (Karabulut 2011; Liarakou 2009).

The opinion of the students about energy sources, the following sources were considered; wind. Solar, hydro, nuclear, biomass waste and fossil. From the information obtained Tables 12 and 13, it is found the students support the use of the above energy resources. more significant support for wind energy with 59.4% the second choice is solar with 55.0% and the last choice is fossil energy sources with just 19.0%. Analysing different ethnic backgrounds choice on wind energy resource, it was discovered that students from Bangladesh support the use of wind energy with 79.5% as the highest, followed by students from Nigeria 74.3% and India 76.5%. The ethnic group shows the least support was the students from Egypt 40.9%. This result parallels the work of Kandpal and Garg (1998).

5. CONCLUSION

Our study is important in highlighting the significance of renewable energy use, revealing the current behaviors of university students on this subject and bringing solutions to current problems by finding out the factors affecting behavior. In this research, an answer was sought to the question of "how are the behaviors of university students towards renewable energy use?". Factors of university student behaviors towards renewable energy use were intended to be determined around this basis. We emphasize the need of an integrated approach in studying the human dimensions of a sustainable energy transition that increases our understanding of which general factors affect a wide range of energy behaviors as well as the acceptability of different energy policies and energy system changes. The study suggests that educated and well-informed young students may convey their knowledge to their illiterate parents to make a general to use renewable energies in common life.

By the findings obtained from the research, the recommendations have been made:

- To decide on teaching methods on environmental subjects which are not efficient or which are not focused enough on school curriculums, research should be carried, and basic environmental studies should also be compulsory.
- From research on this subject, the views of parents, students, and teachers should be listened to. and the comparison should be made.
- The parameters (gender, school, class level, age, educational background of the parents, monthly income of the family, etc.) which have effects on the environmental sensibility of the students should be researched in detail.
- The students should be taken on environmental trips, or they should be encouraged to participate actively in environmental activities by giving suitable duties such as planting and watering trees.
- The students should be encouraged more to participate in scientific activities about the environment such as panels, seminars, conferences.
- Non-governmental organizations related to environmental matters should be promoted much more to the students.
- The volunteer environmental organizations should check out their activities. and they should take measures to provide more efficient activities. Also. these organizations should be promoted to the students. and they should organize environmental activities together with the schools and the students.
- To develop positive environmental attitudes for the students. the students should be provided with an environment. which appeals to their feelings. to apply what they have learned. The gardens and the buildings of the schools should be designed in a way which evokes positive feeling forward nature.
- To increase the environmental knowledge of the students and to develop their environmental attitudes. formal and informal programs should be checked out. and they should be arranged more efficiently.

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