



Assessing Environmental Awareness of Students at the University of Sulaimani

Yaseen Ahmed Hamaamin¹ & Jwan Bahadeen Abdullah¹

1Civil Engineering Department, University of Sulaimani, KRG, Iraq.

Email: yassen.amin@univsul.edu.iq

Article info

Original: 10 August 2018
Revised: 10 December 2019
Accepted: 11 September 2019
Published online: 20 December 2019

Key Words:

Students Environmental Awareness University of Sulaimani

Abstract

Rapid population growth, inadvertent economic development and urbanization led to major threats to natural resources and climate stability of our planet. Therefore, worldwide sustainable planning and management should be phased out soon to prevent environmental collapse. Hence, pro-environmental regulations and policies are crucial. The major difficulty that faces the environmental protection process, is the lack of public participation in pro-environmental behaviour. Raising the rate of environmental awareness among individuals is the effective way for improving public participation in adopting sustainable life and environment. Environmental awareness is a criterion for a harmonious living between humans and the nature. This study investigated and surveyed the environmental consciousness among the University of Sulaimani students through a five-digit scale of a questionnaire survey. In the study, randomly mixed of positive and negative prompts were used. Results of the study showed that the rate of average environmental awareness of the students was slightly above average 2.63 on a 5 digits' scale of evaluation. Results also showed that the university commitment to environmental education is minimal, 2.32 out of 5, thus, there is a gap or deficiency of required green education in most of the university colleges curriculum. This study ended with numerous suggestions to the university decision makers towards raising student's environmental awareness. Green education can be achieved by adding environmental courses in colleges study programs, organizing seminars, and special activities regarding environmental protection.

1. Introduction

Environmental system can be described as all biotic factors (living things) and abiotic factors (non-living things) in our surrounding [1]. Atmosphere (air), hydrosphere (water), lithosphere (land), and biosphere (living organisms) are the major interlinked components of the natural environmental system [1]. There is a continuous reversible interaction between human and the environment mainly caused by humans' activities and vice versa [1]. Therefore, the state of surrounding environment indicates the health and well-being of current creatures and their future generations. Every year millions are killed globally because of the environmental pollutions and contaminations [2]. Unsafe water and sanitation, vector-borne disease, global environmental change, unsustainable urban development, air pollution and urban environmental degradation are the causes of environmental disease burden [3]. The ever-growing of human needs impaired earth's environment through industrialization that applies extraordinary stress beyond the capacity limit of the environment [4], [5] and [6]. Infrequent population growth in urban area rather than rural area impacts environment because of high consumption of energy, food, water, land use and waste emissions [7] and [8]. Therefore, in order to save our environment from degradation and prevent natural disasters, a sustainable planning and management is required.

Individual participation is crucial for a successful environmental management; hence, public environmental education should be increased and maintained. Pro-environmental behavior, is any human behavior or attitude to minimize the negative impact of diverse activities on the environment through protection, preservation and/or conservation of a sustainable world [5], [6], [9] and [10].

Environmental Awareness is the ability to carry on responsible citizenship behavior towards solving environmental problems with attitude, values and necessary skills [6] and [11]. In early 1900s the environment movement was started with basic conversation and advices towards environmental protection. Further, environmental movements throughout education and awareness activities were began since 1960 to address the environmental issues and problems [12]. Wong (2003) [13] noted that, the reaction and judgment of people towards environmental problems indicates the responses from individual group and societal levels. Lack of information, ignoring facts due to costly measures of environmental issues are the main factor which result low public population awareness in many countries [6]. Making people environmentally aware effectively is the key to have a correct and an exact response to the environmental issues that faces people every day and pressure the live and environment [14].

The concepts of environmental awareness are emotional, attitude and practice of sustainability awareness [10]. The harmonious living between humans and nature is the main goal of environmental awareness [4] and [9]. Environmental sustainability is the reduction of negative impacts of human behaviors on environment such as reducing wastes and decreasing energy consumption in the current and the future [15]. Scientists conducted studies on environmental awareness to identify the commitments behavioral level and specific attitude level. The inner cause of environmental concerns and the factors that lead to action are approached in the social psychological worldview studies [4]. The framework of the recent studies on environmental awareness was contained factors that affect environmental concern and behavioral level. Social position, incentive structure, institutional constrains, values, traditional ecological theory, general and specific beliefs, worldview, specific attitude, behavioral intentions and commitment can be considered as important factors towards environmental awareness [16].

Dunlap and Gallup (1993) [17] conducted the health of the planet survey for different economically and geographically individuals. The study illustrated that both attitude of the people and the actual behavior/actions implemented by the citizens are influential. Also, it was explained that a threat to life quality and human welfare are the two phases of environmental problems. Olander and Thogerson (1995) [18] suggested the motivation–opportunity–ability (MOA) model so as to determine the environmental behavior of individuals. The model showed that the intention can be determined by attitude and social norms, while the process between the actual behavior and intention is influenced by the ability and opportunity. Stern (2000) [16] proposed the value–belief–norm (VBN) model which characterized Pro-Environmental Behaviors into four types: environmental activism, public sphere no activist behaviors, private-sphere behaviors, and organization behaviors. It was concluded that the general personality is the start to more environment focused attitude. Hoerisch (2002) [7] carried out a comparative study to investigate the environmental awareness and beneficial behavior in India. In the study factors affecting environmental awareness and the role of media on public behavior upon environment were investigated. The results of the study showed that 52% of the respondents thought that the provided information by media has the most important role on environmental awareness. While only 7% believed that the most important factor affected environmental awareness and behavior is education at school. Altin (2013) [14] investigated a survey study on environmental awareness among secondary school students and factors affecting student’s participation in environmental activities. The survey showed insufficient made of environmental disclosures in schools, low level of student’s participation in environmental activities, and the source of gaining environmental information of students was media. Sivamoorthy et al. (2013) [9] demonstrated a study about college student’s environmental awareness and practices. It was concluded that the level of awareness was high

among students without respecting difference in gender. Sadati (2014) [6] carried out a study to evaluate and investigate amount of environmental awareness and environmental understanding and knowledge among the university students. The results of the study indicated low degree of environmental awareness among university students. Also, minimum level of universities commitment to green education was revealed in the study. Hiramatsu et al., (2015) [19] carried out a study about the environmental consciousness in daily activities using free-answered and negative prompts. The study showed a lower level of environmental awareness with the negative prompt questionnaires. Deniz (2016) [20] carried out a study about sustainable thinking and environmental awareness through designed education. The study concluded that in design of any developing country, the creation of environment, buildings, and products should be in a sustainable way.

Sulaimani City as one of crowded cities of Kurdistan Region of Iraq has diverse environmental issues and problems. Lack of individual participation and effective environmental protection rules and regulation in the city resulted in diverse pollutions [21]. Therefore, in order to start with effective environment protection process, an assessment of environmental awareness of people is required to start with an effective process.

Students are the future decision-makers of the society; for this reason, student's environmental protection attitude is vital for a successful environmental development [6]. The objective of this study is to assess the environmental awareness of University of Sulaimani students, which is prerequisite to launch environmental protection process successfully. Also this study tries to measure the level of environmental education of the university colleges curriculum so as to conclude into a recommendation to university administration to add/enhance environmental courses for departments and colleges to enhance their pro-environmental behaviors.

2. Methodology

2.1 Study Area

University of Sulaimani is the largest and oldest public university in Kurdistan Region of Iraq which is located in Sulaimani City. The university was founded in 1968, and has two campuses, the old and the new campuses. The university consists of 19 colleges with more than 22500 undergraduate students for 2017-2018 academic years in different colleges [22].

2.2 Questionnaire Design

In most of environmental awareness surveys, only positive phrased questions are used, that make the respondent automatically choose "yes" so as to meet positive anticipated social values. This acquiescence biased answer attributed an attitude behavior gap between the real people actions towards environment and the level of environmental consciousness obtained from surveys [23] and [24]. In this study to prevent "yes" bias, a set of positive and negative prompts on environmental behaviors are used. A set of 24 survey questionnaires used to be answered by students as shown in Table 1. Ten of the survey questions, (Q1, Q2, Q7, Q8, Q9, Q10, Q11, Q12, Q16, and Q17) were negative prompts on environmental consciousness. Positive and negative questions arranged and mixed randomly to prevent obtaining same results from surveyees for the same type of questions. Scaling of the prompts was based on five Likert Scale items (strongly agree, agree, neutral, disagree, strongly disagree). Likert scale is a non-comparative scaling technique and psychometric response scale which is used in surveys for the reason of obtaining the degree of agreement of respondents with a set of statement [25].

Table 1 List of the study prompts (questionnaire).

No.	Prompt
Q1	My Pro-Environment Behaviours (PEBs) are based on custom rather than environmental consciousness.
Q2	I think that PEBs should save money.
Q3	Using public transport can protect environment compared to personal cars.
Q4	Papers which are printed in one side can be reused as draft pages to protect environment.
Q5	I always switch the light off when I don't need it anymore.
Q6	I would pay more for products whose production and packaging does less damage to the environment.
Q7	Companies and industries should take more efforts than individuals to improve the environment.
Q8	The government should provide incentives for people to look after the environment.
Q9	Individual action will not improve the environment.
Q10	I will not display PEBs when I do not have the attention of others or society.
Q11	I do not know what behaviours are good or bad for the environment.
Q12	For me, there are more important things than environmental issues.
Q13	My education has helped me to learn about and protect the environment.
Q14	Emissions from industry are the main cause of environmental pollution.
Q15	If my job caused environmental problems, I would rather be unemployed than carry on causing them.
Q16	Nature is strong enough to cope with the impact of modern industrial nations.
Q17	Humans have the right to modify the natural environment to suit their needs.
Q18	Intentional pollution should be legally punished.
Q19	My department has organized several field trips related to environmental Awareness.
Q20	In my view, environmental pollution affects our health.
Q21	Participation in environmental consciousness activities will improve the environment of my university.
Q22	Disposal of waste anywhere around your/us will impact environment.
Q23	Mass media (television, radio, internet, newspaper) provide sufficient information regarding environmental protection.
Q24	Humans must live in harmony with nature in order to survive.

2.3 Sample Size

The most important step in survey researches is the size of the sample from a definite population which depends on statistical rules and assumptions. Statistical formulas (1 and 2) can be used for calculating the size of the sample, the criteria of sample size are sampling error and confidence interval. In most of studies the range of error assumed to be (± 5 percent) and the percentage of confidence interval assumed to be approximately 95% [26]. Israel (1992) [27] created a table (Table 2) to estimate sample size for survey researches depending on different percent errors and 95% confident interval.

$$n_o = \frac{Z^2 pq}{e^2} \dots\dots\dots (1)$$

$$n = \frac{n_o}{1 + \frac{(n_o - 1)}{N}} \dots\dots\dots (2)$$

Where n_o is a sample for proportions, Z^2 is the normal curve abscissa (the desired confidence interval 95% is $1 - \alpha$), e is the precision of desired level, p is present attribute in the population and q is $(1 - p)$. The amount of Z was determined from the statistical tables contain area under the normal curve, n is the size of the sample, N is the population size.

Table 2. Questionnaires sample size with 95% confidence interval for different precision levels, (Israel, 1992).

Population size	Sample size (n) for precision (e) of:			
	± 3%	± 5%	± 7%	± 10%
500	a	222	145	83
1000	a	286	169	91
5000	909	370	196	98
10000	1000	385	200	99
50000	1087	397	204	100
100000	1099	398	204	100

a = Assumption of normal population is poor, then the entire population should be sampled.

2.4 Method of Analysis

The questionnaire respondents were analyzed by setting a five Likert scale values as follows; strongly agree = 5; agree = 4; neutral = 3; disagree = 2; and strongly disagree = 1. In the process of analyzing respondents, the scales of negative prompts were reversed because approximately half of the questionnaires were negative prompts and the results of values assignment can be indicated easily. The smaller the value of response showed the more positive attitudes of the respondents towards environment. Two categories were applied in the procedure of analyzing the responses. The first category was calculating the percentage of respondents for each scale of each question and the second one was grouping questionnaires into five sub groups according to different environmental characteristics factors then calculating the mean scale value of each sub-group. The questionnaires were divided into the following factors, factor “A” represents awareness responsibility (Q2, Q7, Q8, Q9, Q10, Q16, and Q17). Factor “B” represents attitude to environmental problems (Q1, Q12, and Q18). Factor “C” represents daily life environmental awareness responsibility (Q3, Q4, Q5, Q6, Q15, Q21, Q22, and Q24). Factor “D” represents the rate of environmental information (Q11, Q14, Q20, and Q23). Factor “E” represents the role of University education towards environment (Q13 and Q19).

3. Results and Discussion

In this study, for the population number of students at the University of Sulaimani of about 22500, a sample size of 400 students is planned. To account for non-return forms, the number is elevated to 500 survey forms, subsequently 407 forms were returned by student respondents.

The results of respondents were analyzed based on two categories, first percentage of respondents for each question and the second was average of scale values for each grouped questions. According to the results showed in Table (3), 50-60% of the respondents strongly agreed that industries and waste disposing are the main sources of environmental pollutions which impact the health negatively and the way for preventing and reducing contaminating environment is legal punishment. Whereas 40-50% of students strongly agreed with the fact that environment can be protect by individual actions in daily life such as using public transportation, reusing papers, switching off unnecessary lights and using friendly environment products even if they are more expensive. Also, the results showed that most of students did not care about other’s judgements and they think that protecting environment is individual responsibility.

The response of students towards the questions related to University’s role for raising environmental consciousness through education programs and activities were strongly disagreed and disagreed with the percentage of 30-35% and 25-30% respectively. Meanwhile, 30-35% of respondents thought that their Pro-Environment Behaviors are based on their individual environmental awareness. Also they think that environmental education is important and can be improved through participating in environmental awareness activities. Most of students declined that the nature can repair and remove pollution impacts of industrial activities without any human actions. About of 30-35% of students believed that Pro-Environment Behaviors should have financial benefits to individuals, also people who care about environment should be incentive by

government. The responses of students towards non-employing jobs which cause problems in environment were 27% and 23% for neutral and agreed scale respectively.

In the second category of the analysis process, mean value of each grouped questions score were calculated and showed in Table 4. In this study, the larger score of respondents shows the more awareness towards the environment. The results in Table (4) show that on average, the students have slight awareness responsibility and attitude to environmental problems. Also, it was shown that the students are responsible to environment in their daily life activities and may obtained that education by themselves or from mass media. Also Table 4 shows that the students have moderate information about environment. Meanwhile, most of students felt that there is no help from education program in the University of Sulaimani for learning and protecting environment or raising environmental consciousness among students. Moreover, the students declared that there are no effective activities and organized motions in the University towards raising environmental awareness despite of the importance of these actions.

Figures 1, 2 and 3 show percentage of variation (frequency distribution) of the five possible responds (strongly disagree, disagree, neutral, agree, strongly agree) on two different scales, one inside each specific question and the other between the 24 number of questions' answers. The variation of responds are within the range of 2% to 62%. The highest percentage of students' responds is for Q20 with strongly agree of the question answer, while the smallest percentage is for Q4 with strongly disagree of the question answer.

Table 3 Results respond to all questionnaires.

Question	No. of total answered	No. of not answered	Type of the Answer				
			Strongly Disagree%	Disagree %	Neutral %	Agree %	Strongly Agree%
Q1	401	6	17	32	12	28	11
Q2	405	2	12	18	12	33	25
Q3	400	7	3	6	9	38	44
Q4	403	4	2	5	8	39	45
Q5	400	7	5	8	9	33	45
Q6	398	9	8	15	23	32	23
Q7	402	1	6	17	13	24	40
Q8	407	0	8	19	14	28	31
Q9	404	1	46	35	7	6	7
Q10	392	5	55	27	8	5	5
Q11	399	2	20	33	22	18	6
Q12	387	11	26	33	14	17	10
Q13	394	13	35	26	11	17	11
Q14	389	18	5	6	9	30	50
Q15	399	8	14	19	27	23	16
Q16	404	1	34	33	14	11	8
Q17	400	6	21	30	17	21	11
Q18	398	9	5	6	9	26	54
Q19	404	3	38	25	18	12	8
Q20	400	7	5	4	8	21	62
Q21	403	4	3	6	13	32	46
Q22	403	4	5	6	6	27	56
Q23	407	0	10	18	19	32	20
Q24	404	3	5	4	11	38	42

Table 4 Average results of grouped questions.

Grouped Factors	Mean	No. of Prompts
(A) Awareness Responsibility	2.61	7
(B) Attitude to Environmental Problems	3.21	3
(C) Daily Life Environmental Awareness	3.87	8
(D) Rate of Environmental Information	3.59	4
(E) Role of University Education towards Environment	2.32	2

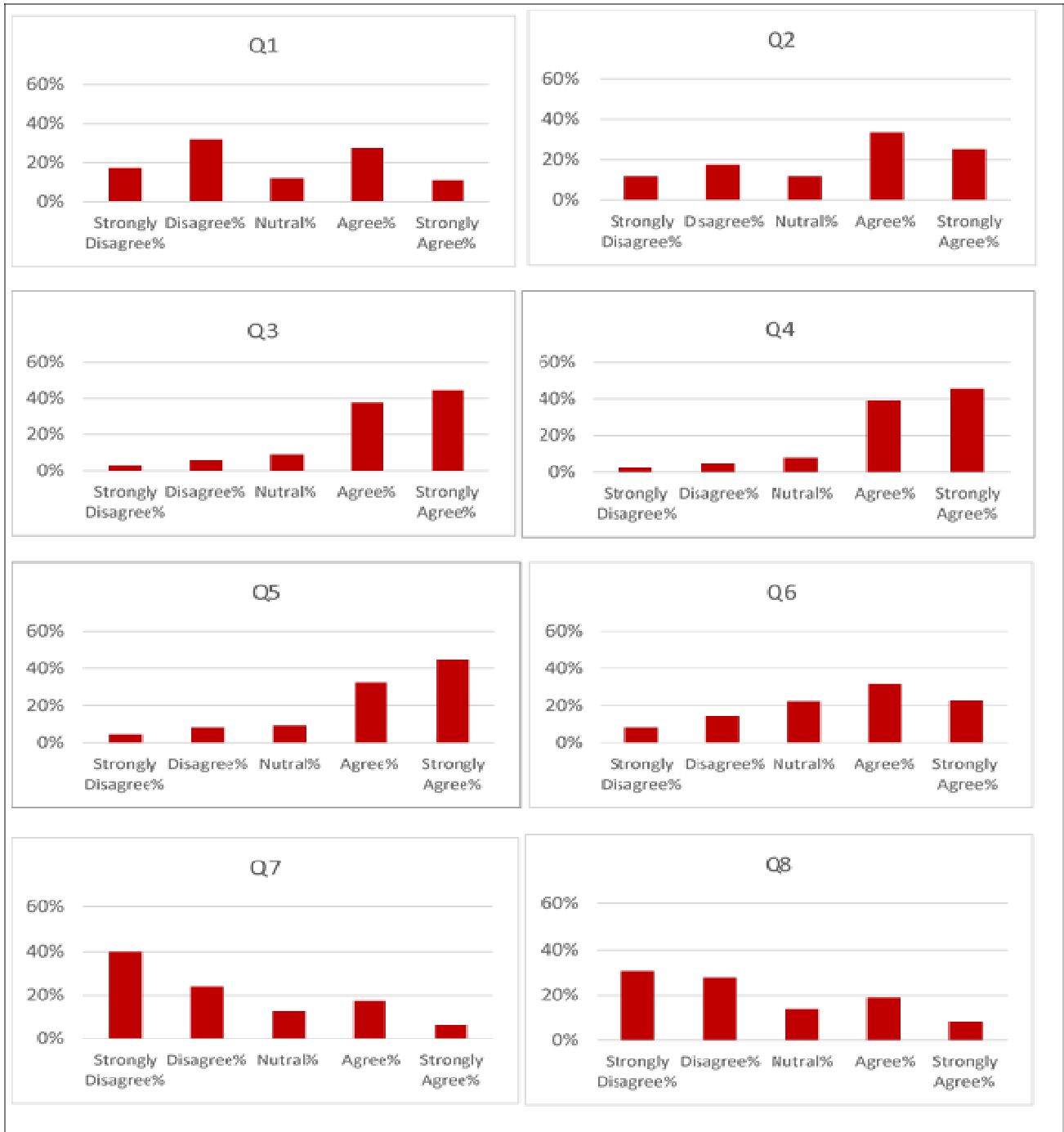


Figure 1. Comparison of students' answers (strongly disagree, disagree, neutral, agree, strongly agree) for questions (Q1 to Q8).



Figure 2. Comparison of students' answers (strongly disagree, disagree, neutral, agree, strongly agree) for questions (Q9 to Q16).



Figure 3. Comparison of students' answers (strongly disagree, disagree, neutral, agree, strongly agree) for questions Q17 to Q24.

4. Conclusions and Recommendations

The measure and assessing of environment protection behavior is vital for launching actions to protect and restore environment. The degree of environmental concerns is varied from country to country, but in most of developing countries addressing the enormous deficits in environment results from continuous education towards environmental protection behaviors.

In this study, students of Sulaimani University were targeted for measuring the rate of environmental consciousness because of the critical role of this crucial group of society in the country. A combination between positive and negative prompts was used in the survey so as to remove the “yes-bias” tendency. From the results of the study, it can be concluded that the rate of environmental awareness among the University of Sulaimani students were moderate rate of consciousness and the level of students’ awareness were based on personal information and responsibility. Also, it can be concluded that the University’s role in the process of improving and raising environmental awareness was significantly low.

This study recommends that the university decision makers should add environmental course in the University of Sulaimani colleges curriculum to elevate student’s environmental consciousness more academically rather than obtaining the awareness from other sources. Also more practical oriented programs can be included in the university’s education program. Organizing activities and campaigns to raise environmental consciousness among the students also recommended. The University can assign a specific day as “environmental day” so as to aware the students toward environmental protection. Green education can be achieved with addition of environmental course in colleges study programs, organizing seminars, special activities and campaigns regarding environmental protection.

As a final point, as the university represents a small sample for the city, through these positive environmental attitudes, the university can play a positive role through a multidiscipline healthy environmental model, to spread that responsible behavior outside of the campus to restore and protect the whole city of Sulaimani environment.

5. References

- [1] Kumaraswamy, M., Love, P. E., Dulaimi, M., & Rahman, M. *"Integrating procurement and operational innovations for construction industry development"*, Engineering, Construction and Architectural Management Vol. 11, No. 5, pp. 323-334. (2004).
- [2] World Health Organization, *"The world health report 2002: reducing risks, promoting healthy life"*. World Health Organization. (2002).
- [3] World Health Organization. *"The world health report 2003: shaping the future"*. World Health Organization. (2003).
- [4] Iizuka, M. *"Role of environmental awareness in achieving sustainable development"*. (2000).
- [5] Parry, M., Parry, M. L., Canziani, O., Palutikof, J., Van der Linden, P., & Hanson, C. (Eds.). *"Climate change 2007-impacts, adaptation and vulnerability: Working group II contribution to the fourth assessment report of the IPCC"*. (Vol. 4). Cambridge University Press. (2007).
- [6] Sadati, S. *"Surveying Environmental Awareness-A Green Education Agenda: The Case of Eastern Mediterranean University"*, (Doctoral dissertation, Eastern Mediterranean University (EMU)-Doğu Akdeniz Üniversitesi, (2014).
- [7] Hoerisch, H., 2002. *"A comparative study on environmental awareness and environmentally beneficial behavior in India"*. Report for CMS ENVIS Centre. (2002).
- [8] Unicef. *"Unicef Humanitarian Action Report 2009"*. (2009).
- [9] Sivamoorthy, M., Nalini, R. and Kumar, C.S. *"Environmental awareness and practices among college students"*. International Journal of Humanities and social science invention, Vol. 2, No. 8, pp.11-15. (2013).

- [10] Mei, N.S., Wai, C.W. and Ahamad, R. "Environmental awareness and behaviour index for Malaysia". *Procedia-Social and Behavioral Sciences*, Vol. 222, pp.668-675. (2016).
- [11] Sengupta, M., Das, J. and Maji, P.K. "Environmental awareness and environment related behaviour of twelfth grade students in Kolkata: Effects of stream and gender". *Anwesa*, Vol. 5, pp.1-8. (2010).
- [12] Smith, K.R., Corvalán, C.F. and Kjellstrom, T. "How much global ill health is attributable to environmental factors?" *Epidemiology-Baltimore*, Vol. 10, No. 5, pp.573-584. (1999).
- [13] Wong, T.K.Y. and Wan, S.P. "Environmental awareness and behavior in Hong Kong: a decade of development". TASPAA Partnership with the International Conference on Sustainable Development. (2008).
- [14] Altin, A., Tecer, S., Tecer, L., Altin, S. and Kahraman, B.F. "Environmental awareness level of secondary school students: A case study in Balıkesir (Türkiye)". *Procedia-Social and Behavioral Sciences*, Vol. 141, pp.1208-1214. (2014).
- [15] Chugh, R., Wibowo, S. and Grandhi, S. "Environmentally sustainable Information and Communication Technology usage: awareness and practices of Indian Information and Communication Technology professionals". *Journal of Cleaner Production*, Vol. 131, pp.435-446. (2016).
- [16] Stern, P.C., Dietz, T. and Guagnano, G.A. "The new ecological paradigm in social-psychological context". *Environment and behavior*, Vol. 27, No. 6, pp.723-743. (1995).
- [17] Dunlap, R.E., Gallup Jr, G.H. and Gallup, A.M. "Of global concern: Results of the health of the planet survey". *Environment: Science and Policy for Sustainable Development*, Vol. 35, No. 9, pp.7-39. (1993).
- [18] O'lander, F., Thøgersen, J. "Understanding consumer behaviour as a prerequisite for environmental protection. *J Consum Policy* 18:345–385 Stern, P.C., 2000. New environmental theories: toward a coherent theory of environmentally significant behavior". *Journal of social issues*, Vol. 56, No. 3, pp.407-424. (1995).
- [19] Hiramatsu, A., Kurisu, K. and Hanaki, K. "Environmental consciousness in daily activities measured by negative prompts". *Sustainability*, Vol. 8, No. 1, pp.24. (2015).
- [20] Deniz, D. "Sustainable thinking and environmental awareness through design education". *Procedia Environmental Sciences*, Vol. 34, pp.70-79. (2016).
- [21] Othman, Nasih, and Thomas T. Kane. "Environmental Health Assessment in Sulaymaniyah City and Vicinity." (2017).
- [22] Univsul, University of Sulaimani, registration office, 2018, <http://univsul.edu.iq/about-university-of-sulaimani>.
- [23] Iarossi, G. "The power of survey design: A user's guide for managing surveys, interpreting results, and influencing respondents". World Bank Publications. (2006).
- [24] Hiramatsu, A., Kurisu, K. and Hanaki, K., 2015. "Environmental consciousness in daily activities measured by negative prompts". *Sustainability*, Vol. 8, No. 1, pp.24. (2015).
- [25] Dane, B. "Likert Scales are the meaning of life. Topic report. CPSC681". pp.1-10. (2006).
- [26] Ryan, T. P. "Sample size determination and power". John Wiley & Sons. (2013).
- [27] Israel, G. D. "Determining sample size, University of Florida Cooperative Extension Service". Institute of Food and Agriculture Sciences, EDIS. (1992).

