Examination of the Environmental Knowledge, Attitudes and Behaviours of Some University Students

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Abstract

The purpose of this study was to explore an empirical examination of the environmental knowledge, attitudes and behaviours of some university students. This study was also aimed to ascertain differences the environmental knowledge, attitudes and behaviours based on students' gender. In addition, the relationships environmental knowledge and environmental attitudes to environmental behaviours were studied. The sample consisted of 360 students (163 male and 197 female) from 4 Universities in Amapura, Sagaing and Kyaukse Township. In the analysis of data, the descriptive statistics, independent t-test and correlation analysis were used. Results of descriptive study showed that University students had moderate level of knowledge, attitudes and behaviours towards environment. Based on gender, there were no significant differences in terms of attitudes and behaviours towards environment. However, there was significant difference in terms of knowledge which male students had higher knowledge to environment as compared to female students. According to the Pearson correlation results, the environmental knowledge and attitudes of students were correlated with environmental behaviours. However, the correlation is weak.

Keywords: descriptive statistics, independent t-test, Pearson correlation

Introduction

In the end of the 20th century, the environmental concerns grew much greater, not only among the developed countries, but also in some developing and underdeveloped nations. The common reason was that the consequences of environmental damages to some vital resources became so apparent and horrifying that governments became worried and mass media found of great value for their headlines; this is due to the public concern (Karimi, 2003). Clear-cutting of forests for agriculture and other forms of development, depletion of the ozone layer, degradation of fish stocks, erosion of the top soil, pollution of water resources, accelerated rate of extinction of species, destruction of varieties of ecosystems and global warming are few examples of environmental issues as a result of the Industrial Revolution followed by exponential development of science and technology which are considered as the main causes for ever-growing environmental degradation. Major consequences of industrial revolution included development of powerful tools and technologies for overcoming the negative characteristics and limiting forces of nature, and changes in lifestyles that result in increased demand for resources, and utilization of natural resources (Karimi, 2003).

There are several and intense studies aiming to protect the balance and to provide sustainability of nature. But, education in this area is necessary in order to understand the environmental problems and make meaningful contribution to the solutions of problems. In other words, education is essential for providing information and awareness to society on environment, to create meaningful change of behaviors in positive and sensitive direction and recovery what had been lost before. Thus, it may be possible to create an environmentally friendly society and to save money and time while solving the problems (Uzun & Saglam, 2006).

Increasing awareness in societies comes together with the protection of environment. Thus, education on environment should be given widely. In recent years, in accordance with environmental problems became one of the top issues of whole world, environmental education has become to be considered as individual and social need. Aim of all efforts to

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protect environment, to prevent environmental pollution and to develop environment is to create comfortable, peaceful and healthy environment for people. In order to reach success in efforts for studies done in the area of environment, youth should be considered as top priority. It is very important to give education to youth to help them define environmental problems; gather necessary information on the subject and to help them give right decision within the scope of this information (Ugulu, 2011).

Many studies on environment, environmental concepts and problems prove that, level of information of students on this subject is not sufficient, they are far from defining environmental concepts properly and they do not recognize environmental problems precisely (Ak, 2008; Altın, 2001; Bahar, 2000; Erol, 2005; Ugulu et al., 2008; Ugulu, 2011; Ugulu & Erkol, 2013; Yılmaz et al., 2002). Environmental education is a process in which individuals not only gain information, awareness and skills, but also they gain the ability to be determined on taking actions in order to solve problems (Erol & Gezer, 2006).The real purpose of environmental education is to bring sensitivity to individual on environmental issues and to develop a critical point of view in interaction with environment and leaving clean and healthy environment to coming generations (Dogan, 1997).

With the environmental education, it is also aimed that individuals can define their own position in ecological balance; develop ideas about how to live in harmony with planet and to gain necessary skills for effective and responsible contribution (Geray, 1995). Irresponsible environmental behaviors are the main causes of many environment problems. Without a doubt, one of the main dimensions that affect these behaviors is the attitude (Bradley et al., 1999). One can talk about several effects in the formation of attitudes. Individual is under the effect of formal education institutions and informal education societies. For providing positive attitude development of students in favor of protecting environment, environmental problems should be undertaken on problem basis. Thus, students are encouraged to see the subject as a problem, to gather information about the subject, to monitor and analyze the natural environment and to develop skills about the ability to decide on environmental issues.

Shaping the behavior of people's can be performed with a variety of activities that can be associated directly to the needs of individuals, groups and society at large. These activities can be performed by various civil society organizations in the environmental community itself. Citizens can participate in the movement or campaign about important issues of concern to be known by the public. In return, the community experience exchange of knowledge, attitudes, behaviors and skill and values of life. The role of civil society organizations or even the mass media such as television, newspapers and radios are very big in helping the campaigns for reformed ideas. The public can easily follow and participate and witness their own changing behaviours due to the campaign.

Mass media, additionally, have the advantages of which are: Reaching a broad audience or reader and a big fast: Creating knowledge and disseminate information: Encouraging change in the attitude and behaviors. Both non-governmental organizations (NGOs) and the mass media have an important role which is expected to develop the patterns of development and saving the environment with a variety of news and activities made by the organizations. In other words, programs conducted by the NGOs and broadcast through mass media will be easily accessible, by the public. News on these successful stories will affect the response, feelings, attitudes and behavior of individuals or society. Environmental quality in the future is depending on the students at present because they are future leaders and most qualified people in managing the environment. For these reasons, the present study attempts to achieve the following objectives:

Objectives of the Study
(i)   To assess environmental knowledge, environmental attitudes and environmental behaviours among University students.
(ii)   To ascertain if there is any significant difference in environmental knowledge, environmental attitudes and environmental behaviours between male and female University students.
(iii)   To investigate the extent of the relationships between environmental knowledge, environmental attitudes and environmental behaviours among University students.

Method

Participants
        The survey was conducted on 360 students (163 male and 197 female) from 4 Universities in Amapura, Sagaing and Kyaukse Township which are Yadanapon University, Mandalar University, Sagaing University and Kyaukse University.

Measures

Environmental Knowledge Scale(EKS)
        The Environmental Knowledge Test (EKS) included 15 multiple choice questions which assessed students' knowledge about local and global environmental issues and basic ecological concept. The15 items of the EKT were adapted from four scales that had been previously validated: the National Environmental Education and Training Foundation (NEETF) / Roper Report Card (NEETF, 1999, 2000), Hasseen Taj (2001) and Hashemaclen (2016). When the respondents selected the right answer they were given 1 and otherwise 0 was given for wrong answer. The knowledge inventory had a Cronbach's alpha reliability coefficient of .64.

Environmental Attitude Scale (EAS)
        The Environmental Attitude Scale (EAS) consisted of 28 questions rated on a 5-point Likert Scale. The 28 items of the EAS were drawn from three scales that had been previously validated: Hasseen Taj (2001), Misfsued (2011) and Hashemaclen (2016). Each item alternative is assigned a weight age ranging from 1 (strongly disagree), 2 (disagree), 3 (unsure), 4 (agree), and 5 (strongly agree) for favorable items. 9 items out of 28 items (Item No.2, 8, 13, 20, 23, 24, 25, 26 and 27) are reversed-coded. The EAS had a Cronbach's alpha reliability coefficient of 0.83.

Environmental Behaviour Scale (EBS)
        The environmental behaviour items were mainly selected from Hashemaclen (2016) and Misfsued (2011) examined the frequency of specific environmental actions that students reported they had undertaken at home, school, and in other places. There were 18 items with a three-point scale (frequently do it, sometimes do it, never do it) that probed what students felt they were currently doing. The EB had a Cronbach's alpha reliability coefficient of 0.77.

Procedure
        In order to conduct a questionnaire study, the test booklets were administered to the participants individually. Before the test booklets were given to the participants, the respondents were explained the purpose of the study, assuring confidentiality of them, and requesting the participants on a voluntary basis. Participants responded and returned the booklets anonymously.

Data Analyses

Finally the data were analyzed using Statistical Package for Social Science: SPSS (version 22). Basic data were taken in to consideration. In order to analyze and interpret the questionnaire scores the investigator adopts the following statistical techniques: (i) Mean (ii) Standard deviation (iii) Frequency (iv) Percentages (v) t-test (vi) Pearson correlation

Results and Discussion

Results

Table 1: Profile of Research Respondents

Profile of Respondents	Frequency	Percentage (%)
Gander:		
Male	163	45.28
Female	197	54.28

Profiles of respondents are showed as in table 1. Distribution of the number of samples involved in this study was 163 (45.28%) male students, while 197(54.72%) students representing female students.

TABLE 2: Means, Standard Deviations University Students' Environmental Knowledge, Attitudes, and Behaviours

Dimension	N	Number of Items	Maximum Possible Scores	M	SD
Environmental Knowledge	360	15	15	6.28	2.09
Environmental Attitudes	360	28	140	111.34	7.86
Environmental Behaviours	360	18	54	39.91	4.44
Total	**360**	**61**	**209**	**157.53**	**14.39**

The mean and standard deviation of University students' environmental knowledge, attitudes and behaviours in descending order were reported in table 2 as follows: Environmental Knowledge (M = 6.28, SD = 2.09),Environmental Attitudes (M = 111.34, SD = 7.86) and Environmental Behaviours (M = 39.91, SD = 4.44). University students' responses on the environmental knowledge, attitudes and behaviours items are shown in table 3, 4 and 5 respectively.

Table 3: University Students' Responses on the Environmental knowledge Items

No.	Statement	Mean	Std	Responses			
				Correct		Incorrect	
				F	%	F	%
1.	EK 1	.78	.42	279	77.5	81	22.5
2.	EK 2	.49	.50	176	48.9	184	51.1
3.	EK 3	.15	.36	54	15.0	306	85.0
4.	EK 4	.13	.34	48	13.3	312	86.7
5.	EK 5	.87	.34	313	86.9	47	13.1
6.	EK 6	.29	.45	103	28.6	257	71.4

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7.	EK 7	.59	.49	214	59.4	146	40.6
8.	EK 8	.19	.39	68	18.9	292	81.1
9.	EK 9	.21	.40	75	20.8	285	79.2
10.	EK 10	.22	.41	79	21.9	281	78.1
11.	EK 11	.45	.50	163	45.3	197	54.7
12.	EK 12	.37	.48	132	36.7	228	63.3
13.	EK 13	.31	.46	111	30.8	249	69.2
14.	EK 14	.78	.42	280	77.8	80	22.2
15.	EK 15	.46	.50	165	45.8	195	54.2

Table 4: University Students' Responses on the Environmental Attitude Items

No.	Statement	Mean	Std	SD		D		N		A		SA	
				F	%	F	%	F	%	F	%	F	%
1	EA 1	4.46	.59	1	0.3	3	0.8	2	0.6	177	49.2	117	49.2
*2	EA 2	2.98	1.03	24	6.7	102	28.3	90	25.0	132	36.7	12	3.3
3	EA 3	4.08	.72	2	0.6	12	3.3	33	9.2	222	61.7	91	25.3
4	EA 4	4.22	.75	2	0.6	13	3.6	19	5.3	197	54.7	129	35.8
5	EA 5	3.80	.92	7	1.9	27	7.5	71	19.7	181	50.3	74	20.6
6	EA 6	3.90	.84	2	0.6	24	6.7	64	17.8	189	52.5	81	22.5
7	EA 7	4.51	.59	1	0.3	2	0.6	5	1.4	155	43.1	197	54.7
*8	EA 8	3.81	.89	75	20.8	175	48.6	79	21.9	27	7.5	4	1.1
9	EA 9	4.49	.59	1	0.3	1	0.3	8	2.2	162	45.0	188	52.2
10	EA 10	4.50	.59	1	0.3	-	-	12	3.3	153	42.5	194	53.9
11	EA 11	4.45	.66	1	0.3	5	1.4	12	3.3	154	42.8	188	52.2
12	EA 12	3.80	.95	10	2.8	17	4.7	94	26.1	153	42.5	86	23.9
*13	EA 13	2.83	1.24	30	8.3	98	27.2	74	20.6	97	26.9	61	16.9
14	EA 14	3.74	.70	3	0.8	7	1.9	107	29.7	206	57.2	37	10.3
15	EA 15	4.17	.61	-	-	6	1.7	24	6.7	233	64.7	97	26.9
16	EA 16	4.39	.60	1	0.3	2	0.6	10	2.8	188	52.2	159	44.2
17	EA 17	4.09	.97	4	1.1	21	5.8	68	18.9	113	31.4	154	42.8
18	EA 18	4.26	.67	1	0.3	7	1.9	19	5.3	204	56.7	129	35.8
19	EA 19	4.10	.74	5	1.4	5	1.4	36	10.0	217	60.3	97	26.9
*20	EA 20	3.29	1.01	35	9.7	127	35.3	124	34.4	55	15.3	19	5.3
21	EA 21	4.18	.79	4	1.1	10	2.8	32	8.9	187	51.9	127	35.3
22	EA 22	3.93	.90	7	1.9	17	4.7	67	18.6	174	48.3	95	26.4
*23	EA 23	3.99	.87	92	25.6	208	57.8	31	8.6	22	6.1	7	1.9
*24	EA 24	3.12	.96	28	7.8	92	25.6	146	40.6	82	22.8	12	3.3
*25	EA 25	4.21	.96	159	44.2	156	43.3	16	4.4	18	5.0	11	3.1
*26	EA 26	4.34	.87	196	54.4	108	30.0	44	12.2	7	1.9	5	1.4
*27	EA 27	3.57	.97	62	17.2	137	38.1	114	31.7	39	10.8	8	2.2
28	EA 28	4.16	.81	4	1.1	8	2.2	45	12.5	174	48.3	129	35.8

*negatively-worded items

Table 5: University Students' Responses on the Environmental Behaviour Items

| No. | Statement | Mean | Std | Reponses | | | | | |
| | | | | Never | | Sometimes | | Frequently | |
				F	%	F	%	F	%
1	EB1	1.96	.59	70	19.4	235	65.3	55	15.3
2	EB 2	1.85	.70	119	33.1	176	48.9	65	18.1
3	EB 3	2.71	.59	25	6.9	53	14.7	282	78.3
4	EB 4	2.59	.62	25	6.9	99	27.5	236	65.6
5	EB 5	2.77	.52	16	4.4	51	14.2	293	81.4
6	EB 6	1.94	.76	116	32.2	151	41.9	93	25.8
7	EB 7	2.19	.66	57	15.8	179	49.7	124	34.4
8	EB 8	2.11	.59	45	12.5	229	63.6	86	23.9
9	EB 9	2.15	.62	45	12.5	215	59.7	100	27.8
10	EB 10	2.36	.58	19	5.3	194	53.9	147	40.8
11	EB 11	2.28	.60	28	7.8	204	56.7	128	35.6
12	EB 12	2.49	.54	7	1.9	171	47.5	182	50.6
13	EB 13	2.15	.59	40	11.1	227	63.1	93	25.8
14	EB 14	2.48	.62	25	6.9	139	38.6	196	54.4
15	EB 15	1.98	.59	67	18.6	234	65.0	59	16.4
16	EB 16	1.69	.70	46	12.8	75	20.8	239	66.4
17	EB 17	2.54	.71	162	45.0	149	41.4	49	13.6
18	EB 18	1.70	.61	136	37.8	196	54.4	28	7.8

Table 6: Level of Environmental knowledge Among University Students

Level of Environmental knowledge	Frequency	Percentage (%)
High	99	27.5
Medium	198	55
Low	63	17.5
Total	**360**	**100**

Table (6) presented the environmental knowledge level of respondents. The data analysis revealed that nearly half of the respondents (55%) had medium level of knowledge about issues that related environment, environmental problems and conservation activities in the study area. On the other hand 17.5% of 360 respondents mean scores showed that, they had low level of environmental knowledge.

Table 7: Level of Environmental Attitudes Among University Students

Level of Environmental Attitude	Frequency	Percentage (%)
High	70	19.45
Medium	237	65.83
Low	53	14.72
Total	**360**	**100**

Table (7) also displayed the environmental attitude of respondents. The table depicts that, 19.45% of the respondents categorized under high level of attitude about environmental issues whereas 14.72 % of them classified under low level of attitude and the rest at medium level.

Table 8: Level of Environmental Behaviours Among University Students

Level of Environmental Behavior	Frequency	Percentage (%)
High	32	8.89
Medium	254	70.55
Low	74	20.56
Total	**360**	**100**

The results of environmental behaviours were displayed in the table 8.The 70.55% of the students acquire a medium level of environmental behaviours. Only 8.89 % of the students acquire a level of high environmental behaviours. The remaining 20.56 % are considered low level of environmental behaviours.

Table 9: Mean Differences in University Students' Environmental Knowledge, Attitudes and Behaviours based on Gender

Variables	Gender	No. of Sample	Mean	S.D	Mean Differences	T. value	Level of Sign:
Knowledge	Male	163	6.61	2.15	.60	2.74	.01
	Female	197	6.01	2.01			
Attitude	Male	163	111.69	7.69	.63	0.75	ns
	Female	197	111.06	8.00			
Bahaviour	Male	163	40.40	4.72	.90	1.91	ns
	Female	197	39.50	4.16			

*significant at level p<0.05

The statistical t-test in this survey between male and female group shows the mean of 111.69, 111.06, 40.40, and 39.50 and with SD 7.69, 8.00 and 4.72, 4.16 respectively, which indicates no significant differences of mean between two groups in environmental attitudes and behaviours. This is indicates that male and female respondents have similar attitudes and behaviours towards the environment. However, there were significant differences between male and female students in terms of knowledge which male students' knowledge (M = 6.61, SD=2.15) toward the environment were higher compared to female students (M = 6.01, SD= 2.01). Refer to Table 9.

Table 10: Pearson's Product Moment Correlations among Environmental Knowledge, Environmental Attitudes and Environmental Behaviours

	EA	EK	EB
Environmental Attitudes, EA	1	.21**	.20*
Environmental Knowledge, EK	.21**	1	.20**
Environmental Behaviours, EB	.20**	.20**	1

Notes; * $P < .05$, ** $P < .01$, *** $P < .001$

Results from Pearson analysis showed there was a significant relationship between knowledge (r = 0.20, p <.01) and attitudes (r = 0.20, p <.1) to the practices of the environment. Moreover, there was a positive correlation between environmental knowledge and environmental attitudes which was statistically significant (r = 0.21, p<.01). We found statistically positive correlations between the environmental knowledge, attitudes and behaviours of University students. However, the relationship is weak.

Discussion

To answer the questions and investigate the knowledge, attitudes and behaviors of University students towards the environment, we categorized three levels, based on the total score of test items. According to results, 225 students have middle level in environment knowledge. 8 students have only high level. 63 students couldn't correct answer even half of questions. Therefore, students' knowledge toward environmental issues is not very high. As the survey analysis revealed that, out of the total respondents 70 of them had favorable attitude to environment, pro-environmental actions and conservation activities, whereas 53 respondents had unfavorable attitude. Consequently the analysis showed that 23 7participants had neither favorable nor non-favorable attitude about environmental issues, i.e. they were neutral or apathetic. Generally, it exhibits medium participation in environmental activities and protection. A number of 74 students out of the total 360 respondents amounting to 20.56% fall under low participation. Similarly, 254 respondents with 70.55 valid percent were ranked among the medium category. The respondents with high level of participation in environmental activities and protection are 32 with only 8.89%.

The second objectives was tested by using the independent sample t-test at a specified significance level, alpha = .05. Generally, male University students demonstrated higher environmental knowledge, more positive environmental attitudes, more actively engaged in environmental behaviours as compared to their female counterparts. As shown in table 9, independent sample t-test results showed that there were no significant differences in University students' environmental attitudes and behaviours based on gender. However, there was a significant difference in environmental knowledge, between male and female University students ($t = 2.74$, $df = 358$, $p < .05$). The results of this study showed some contradictions with Kibert's (2000) and Uzun (2007) studies. In Kibert's (2000) study, gender differences in environmental knowledge have been detected with females generally demonstrating higher knowledge than males. In contrast, males have been shown to have more environmental knowledge than females. Kibert's (2000) study supported the studies presented in the literature review. Uzun (2007) study reported that the environmental knowledge, attitudes and behaviour of students were not found be statistically significant. Similar with our result, Gifford et al. (1982) found in their study of undergraduates that males scored higher in environmental knowledge than females and that more females than males reported they would do something about environmental problems. Likewise, Hausbeck et al. (1992) and Scott and Willits (1994) reported that males had slightly more environmental knowledge than females.

The third objective was tested by using the Person's product-moment correlation. According to the descriptive results of this study, it has been observed that there were significant correlations between University students' environmental knowledge, attitudes and behaviors. These scores were positively correlated, indicating that, as knowledge scores increased, attitude scores increased toward a more favorable attitude. And then, more frequently do toward environmental behaviours. Therefore, students scoring higher on the knowledge scale tended to have more favorable environmental attitudes and behaviours. This statistically significant finding is important ($p<0.05$). Because it suggests that increased knowledge may help improve environmental attitude and behaviours. These findings are consistent with other research (Kuhlemeier et al., 1999, Makki et al., 2003, Scott and Willits, 1994 and Hines et al.1987).

Conclusion and Suggestions
Conclusion
This study investigated University students' knowledge, attitudes and behaviours of the environment. In general, students possess good knowledge of the environment which can be attributed to the continuous effort made by the government and educational institutions to promote sustainable development. However, it is important to note that students' knowledge and behaviours are weakly associated. This indicates that high level of knowledge among students may not necessarily leads to good behaviousr. Students' attitudes toward the environment also could not be used to predict behaviours. This is due to the weak relationship between both variables. These findings indicate the complex relationships between students' environmental knowledge, attitudes and behaviours.

Suggestions
        Research findings showed there was a significant relationship between knowledge and attitudes to the practices of the environment. This shows that to improve the environmental behavious, students should be provided with the knowledge to build awareness and develop a positive attitude towards the environment. Therefore it is suggested that environmental education should be applied in all studies to ensure the consistency of environmental behaviours among students. Stakeholder such as government agencies, non-governmental organizations and mass media also play vital roles in improving the practice of students towards the environment.

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