

Determinants of Environmental Attitudes and Behaviours of Nigerian Undergraduates: A case of Federal University of Technology, Akure, Nigeria

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ABSTRACT

This study evaluated the determinants of environmental attitudes and behaviours of Nigerian undergraduates as well as the relationship that exists between their attitudes and behaviours using the Federal University of Technology, Akure (FUTA), Nigeria as a case study. The instrument for data collection was semi-structured questionnaire. A total of 367 students were randomly selected using multi-stage random sampling method and Krejcie and Morgan determination of sample size. Respondents (students) were randomly selected from nineteen (19) Departments from the six (6) Schools (faculties) in the University. Data were analysed using descriptive statistics, chi-square analysis, Pearson's correlation and multiple linear regression analysis. The results revealed that there were more male (52.6%) than female students. The mean age of the respondents was 19 years while the median age was 22 years. Means of attitudinal items were higher than that of behavioural items. The results revealed that religion, childhood outdoor experience and membership of environmental related NGOs were the determinants of environmental attitudes while religion was the only determinant of environmental behaviours. There was significant relationship between students' environmental attitudes and their behaviours. Planned and consistent infusion of environmental issues in curriculum and University wide programmes could impact positively on students' environmental behaviours

Keywords: Environmental knowledge, attitudes, predictors, undergraduates, behaviour, FUTA.

INTRODUCTION

Environmental degradation is a very crucial issue that needs urgent intervention. Humans continue to engage in environmental unfriendly behaviours at the individual, corporate, governmental and societal levels (Ugulu and Erkol, 2013). The consequences of human activities on the environment have been discovered to have long-term consequences. From the beginning of the twentieth century, the environmental issues, problems and challenges have been at the centre of peoples' daily lives, in such a way that in the mid 1920's, worrying consequences of environmental pollution attracted more attention every day (Lorey and Kemp, 2007). The world is now alarmed with various environmental problems such as climate change, ozone layer depletion, global warming, among others (Sarkar, 2011). Many of these problems are the result of irresponsible environmental behaviour, which is highly influenced by the attitudes people possess (Ramsey and Rickson, 1975, Meinhold and Malkus, 2005.). Shultz (2000) stressed that environmental concerns can only develop when people see themselves as essential in the environment.

One of the numerous impacts of globalisation is environmental damage. The increasing pace of

globalisation means that environmental degradation will be an important issue in the future (Kilbourne and Polonsky, 2005). As the world's population continues to expand, the role of conservation is becoming critical (Chan, 1996). Conservation is defined by IUCN-UNEP-WWF (1980) as the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. Maloney and Ward (1973) described the ecological crisis not as a technical problem but as a crisis of maladaptive behaviour and the root of the environmental problems as human behaviour.

Environmental attitudes apply to general feelings toward ecology and the environment, feelings and concern for specific environmental issues, and feelings toward acting to remedy environmental problems (Ugulu *et al.*, 2013). According to Ewert and Galloway (2004), environmental attitude is one of the most widely studied constructs in the study of human interaction with the natural environment. Newhouse (1990) suggested that attitudes which are derived from life experiences and education markedly influence behaviour. Only then can a positive

environmental attitude be achieved. To achieve behavioural changes associated with a particular issue requires changing the peoples' attitude towards the same issue (Maleki and Karimzadeh, 2011).

Among other things, the school is important in contributing to students' understanding of the environment and environmental issues. Eilam and Trop (2012) stressed that students' environmental attitudes have been greatly influenced by schools. Several studies disclosed that the expressed environmental attitudes of students showed that environmental attitudes positively affected environmental behaviour (Schultz, 2001; Chuleewan and Kongsak, 2012). Also, Ugulu *et al.* (2013) observed that students' attitudes affect their behaviour, particularly their choice of action, and persistence to give a decision. Maleki and Karimzadeh (2011) suggested that achieving environmental attitudes and exploring individual cognition are essential in research in environmental behaviour. However, in order to face the challenges of environmental issues and problems (e.g. pollution, deforestation, salinity, urbanisation, global warming and climate change), it is important to acquaint our younger generation with appropriate knowledge, skills and attitudes relating to the environment (Sarkar and Ara, 2007), because this generation will affect and be affected by the environment management policy undertaken today. This study evaluated the determinants of undergraduate students' environmental attitudes and environmental behaviours as well as the relationship between their attitudes and behaviours. We hypothesized that i. demographic factors of the students were not good determinants of their environmental attitudes and behaviours, ii. demographic factors do not significantly affect students' environmental attitudes and their behaviours and, iii. there is no significant relationship between students' environmental attitudes and their behaviours. It is hoped that this study will give direction on factors that determine attitudes and behaviours and facilitate policies aimed at improving students' environmental attitudes and their actual behaviours.

MATERIALS AND METHODS

The study area was conducted at the Federal University of Technology, Akure (FUTA), Ondo State, Nigeria. The

climate of Ondo State is of the Lowland Tropical Rain Forest type, with distinct wet and dry seasons. In the south, the mean monthly temperature is 27°C, with a mean monthly range of 2°C, while mean relative humidity is over 75%. However, in the northern part of the state, the mean monthly temperature and its range are about 30°C and 6°C respectively. The mean monthly relative humidity is less than seventy percent. In the south, rain falls throughout the year, but the three months of November, December and January may be relatively dry. The mean annual total rainfall exceeds 2000 millimeters. However, in the north, there is marked dry season from November to March when little or no rain falls. The total annual rainfall in the north, therefore, drops considerably to about 1800 millimeters (University of Agriculture, Abeokuta-Institute of Food Security, Environmental Resources and Agricultural Research, UNAAB-IFSERAR, 2009).

FUTA is geo-referenced on coordinate lines of 734393E, 808614N; on the western flank and 737291E, 806714N on the Eastern flank of meridians. Down to the south is Aule Community; up in its north is Ipinsa Community Lands interpose by Akure-Ilesa Express way, on the west Ilara and Ibule settlements while to the east is southern part of Akure Metropolis; all these areas are made up of FUTA environs (Oyinloye, 2013). FUTA came into being in 1981 and was set up to give prominence to technological training and provide the much required impetus for rapid technological and industrial development in Nigeria. Academic activities commenced in 1982 with the establishment of three foundation Schools namely, School of Agriculture and Agricultural Technology (SAAT), School of Earth and Mineral Sciences and School of Pure and Applied Sciences (Federal University of Technology, 2013). As at the time of this study, FUTA had six Schools (Faculties) and 38 Departments which were: School of Agriculture and Agricultural Technology (SAAT) (8 Departments), School of Engineering and Engineering Technology (SEET) (6 Departments), School of Earth and Mineral Sciences (SEMS) (5 Departments), School of Environmental Technology (SET) (7 Departments), School of Management Technology (SMAT) (3 Departments) and School of Sciences (SOS) (8 Departments).

Table 1: Sample size and respondents' selection

School	No of Departments	No selected	No of students in each of the Schools	No of respondents
SAAT	8	4	1204	55
SEET	6	3	1492	67
SEMS	5	3	1180	55
SET	7	3	1316	59
SMAT	4	2	752	33
SOS	8	4	2191	99
Total	38	19	8,135	367

SAAT: School of Agriculture and Agricultural Technology; SEET: School of Engineering and Engineering Technology; SEMS: School of Earth and Mineral Sciences; SET: School of Environmental Technology; SMAT: School of Management Technology; SOS: School of Sciences

Table 2: Demographic factors of respondents (N=367)

Demographic factors	Frequency	Percentage (%)
School		
SAAT	54	14.7
SEET	67	18.3
SEMS	55	15.0
SET	59	16.1
SMAT	33	9.0
SOS	99	27.0
Level		
200	121	33.0
300	121	33.0
500	125	34.0
Sex		
Male	193	52.6
Female	174	47.4
Age (years)		
17-23	235	68.5
24-30	132	58.5
Mean	19	
Median	22	
Religion		
Islam	54	14.7
Christianity	319	85.3
Residence		
Urban	247	67.3
Rural	108	32.7
Ethnicity		
Yoruba	288	78.5
Others	79	21.4
Political affiliation		
ACN (Progressive)	172	46.9
PDP (Conservative)	195	53.2
Childhood outdoor experience		
Yes	271	73.8
No	102	27.8
Parents wealth class		
Average	283	77.1
High	71	19.3
Low	13	3.5
Membership		
Yes	79	21.5
No	288	78.5

Sample, Survey Procedure, Measurement and Analyses

The population for this study was the undergraduates of the Federal University of Technology, Akure (FUTA), Nigeria. The list of undergraduate students was obtained from the Students' Affairs Unit of the University. Respondents were selected using multi-stage random sampling method. In all

the Schools (Faculties) of the University, 50% of the Departments in each School were selected for the study. The sample size of 367 was obtained from 8,135, the total number of undergraduates in the University using Krejcie and Morgan (1970) sample size determination (Table 1).

The sample size was proportionally distributed among the selected Schools and Departments based on their population. Thus, the number of respondents selected in SAAT was 55 with 12 respondents from Ecotourism and Wildlife Management Department (EWM), Agricultural Resource Economics (ARE) had 12, Food Science and Technology (FST), 19, and Forestry and Wood Technology (FWT), 12. SEET had 67 respondents with 21 respondents from Agricultural Engineering (AGE), 21 from Metallurgical and Material Engineering (MME), and 25 were from Electrical and Electronic Engineering (EEE). For SEMS, there were 53 respondents with 19 from Applied Geology (AGY) Department, 16 from Meteorology (MET) and 18 from Applied Geophysics (AGP). In addition, 59 respondents were from SET with 21 from Architecture (ARC) Department, 17 from Industrial Design (IDD) and 21 from Urban and Regional Planning (URP). SMAT had 34 respondents with 19 from Project Management (PMT) and 14 from Transport Management (TMT). Also, there were 99 respondents from SOS with 33 from Mathematics (MTS), 24 from Computer Science (CSC), 18 from Biology (BIO) and 24 from Physics (PHY).

The instrument for data collection was structured questionnaire. The questionnaire sought information on socio-demographic factors such as School (Faculty), Department, level of study, gender, age (years), religion, residence, ethnic group, political ideology, childhood experiences, wealth/class features, membership of NGO on environment, non-demographic variables, knowledge statements, attitudinal statements and behavioural statements. School was rated as School of Agriculture and Agricultural Technology (SAAT) = 1, others= 0, while level was measured as 200 level= 1, others= 0. Gender was measured as male=1, female=0. Age was measured in years. Religion was measured as Christianity=1, others=0. Residence was measured as urban=1, rural =0. Ethnic group was measured as Yoruba=1, others=0. Political affiliation was measured as Action Congress of Nigeria (ACN)=1, Peoples Democratic Party (PDP)=0. Childhood outdoor experience was measured as Yes=1, No=0. Parents wealth class was measured as average=1, others=0. Membership of NGOs related to environment was measured as yes=1, no=0.. The dependent variables (Environmental attitudes and environmental behaviours) were measured on a five-point Likert scale. Attitudes were measured using Wisconsin Centre for Environmental Education (1994) and Chan (1996) environmental attitude scales while

environmental behavioural scales employed were Mderrisođlu and Altanlar (2011) and Chan (1996) environmental behavioural scales. Internal consistency determination followed Cronbach’s (1951) method. Cronbach’s Alpha reliability for environmental attitudes was 0.55 while it was 0.88 for environmental behaviours. Data obtained were analysed using descriptive statistics while hypotheses were tested using one-way analysis of variance (ANOVA) with Tukey’s HSD, t- test and multiple linear regression.

RESULTS AND DISCUSSION

Table 2 shows the demographic characteristics of the respondents. School of Science (SOS) had the highest number of respondents (27.0%) while School of

Management Technology (SMAT) had the lowest (9.0%). This might be attributed to the fact that SOS had the largest number of students (2191) in the University while SMAT had the lowest (752) as at the time of this study. Among the levels of study, 500 level had the highest number of respondents with 34.0%. There were more male (52.6%) than female respondents. That there were more male than female respondents might be a factor of level of enrolment of more male in Science and Technology Courses than female. This is consistent with Aderemi *et al.* (2013) that observed that the number of female students admitted for Science and Technology courses was consistently lower than that of their male counterparts. The mean age of the respondents was 19 years while the median age was 22 years.

Table 3: Frequency distribution, means and Standard Deviations (SD) of undergraduates’ response to items on environmental attitudinal scale (N=367)

Attitudinal Statements	Mean	Standard Deviation
Humans are severely abusing the environment	4.41	0.70
I would be willing to make personal sacrifices for the sake of slowing down pollution and animal extinction even though the immediate results may not seem significant	4.01	0.81
Courses focusing on the conservation of natural resources should be taught in schools	4.46	0.74
If asked, I would contribute time or money to an organisation that works to improve the quality of the environment	3.90	0.93
I like hearing the sound of animals such as birds and insects calling when I am outside	3.14	1.26
I think most of the concern about environmental problems has been exaggerated	2.36	1.10
Knowing about environmental problems and issues are important to me	4.13	0.86
More land should be set aside for wildlife habitats	4.05	1.04
If a person’s car exceeds certain standards for air pollution, he or she should be allowed to drive it	2.69	1.37

Table 4: Frequency distribution, means and Standard Deviations (SD) of undergraduates’ responses to items on environmental behaviour scale (N=367)

Behaviour Statements	Mean	Standard Deviation
Turned off lights and appliances when they are not being used in order to conserve electricity	3.87	1.10
Switched from one brand to another due to concern for the environment.	2.87	1.13
Donated money or paid membership dues to a conservation organisation	2.53	1.28
Set a positive environmental example for your friends to follow	3.81	1.06
Taken your own shopping bag when shopping	3.37	1.31
Recycled paper, empty bottles, glass, aluminium cans and/or metal waste products at home or at school	2.67	1.29
Tried to learn what you can do to help solve environmental issues	3.68	1.04
Talked to your family and friends about what they can do to help solve environmental problems	3.51	1.11
Joined in family clean-up effort	3.40	1.16
Used legal measures to stop events you thought would damage the environment	2.65	1.40
Made a point of reading newspaper, magazine, articles and watching TV programmes about the environment	3.43	1.10
Sent letters to the newspaper about environmental issues	1.87	1.22
Reported environmental problems or violations that you have noticed to the proper authorities	2.17	1.38

The median age of 22 years was higher than the estimated national median age of 17.9 years (CIA, 2015). In terms of religion, 83.7% of the respondents practised Christianity which was higher than CIA (2015) estimates for Nigeria of 50.0% for Islam, 40% for Christianity and 10.0% for indigenous beliefs. 67.3% of the respondents' permanent residence was urban centre; which is higher than World Bank (2015) estimates of 53% living in rural areas of the country in 2014. About 46.9% of the respondents are members of Action Congress of Nigeria (ACN), a dominant political party in Southwest Nigeria at the time of this study. Also, 73.8% had childhood outdoor experience such as visiting parks, gardens and zoos. In terms of wealth, 77.1% of the respondents reported to belong to average wealth class, this could be an indication that their parents belong to the middle class. A large percentage (73.6%) of the respondents did not belong to any environmentally oriented non-governmental organisations on.

Large percentages of respondents (78.5%) were from the Yoruba ethnic group, this might be due to the location of the University which is in the South-western part of the country where the Yoruba ethnic group dominates. Table 3 presents the means (range: 2.69 to 4.46) and standard deviations of environmental attitudes of the students. Teaching of courses on the conservation of natural resources in Schools had had the highest mean effect (Mean= 4.46, SD= 0.74) on students' environmental attitude, which was closely followed by their knowledge that humans are severely abusing the environment (Mean= 4.41, SD= 0.70) and the importance of their knowing about environmental problems and issues (Mean= 4.13, SD= 0.86). The least means were for their opinion that environmental problems have been exaggerated (Mean= 2.36, SD=1.10). This implication of the results is that the students' environmental attitudes were positive. The results are consistent with previous findings by Gigliotti (1992) and Chan (1996) that students highly supported environmental attitudes.

The mean average of the students' environmental behaviour ranged from 1.87 to 3.87 (Table 4). The results indicated that more undergraduate students are likely to turn off lights and appliances when they are not in use to conserve electricity (Mean= 3.87, SD= 1.10), which was closely followed by their preparedness to set positive environmental example for friends to follow (Mean= 3.81, SD= 1.06) and their willingness to learn what can be done to help solve environmental issues (Mean= 3.68, SD= 1.04). Students' were unlikely to send letters to newspapers about environmental issues (Mean= 1.87, SD= 1.22) and are not likely to report environmental problems or violations appropriate authorities (M= 2.17, SD= 1.38). The results are indication that the students exhibited slightly higher environmental attitudes than their behaviour.

According to Mderrisođlu and Altanlar (2011), studies carried out in other parts of the world indicated that there are differences between environmental attitudes and environmentally responsible behaviours of undergraduate students.

Significant difference was observed in the attitudes of the respondents based on School (faculty) ($p<0.05$), age ($p<0.05$) religion ($p<0.01$), residence ($p<0.05$) and membership of NGOs that are environmentally oriented ($p<0.05$). Tukey's HSD showed that environmental attitude of students in SET (mean=34.39) was significantly higher while that of SMAT (mean=31.42) was significantly lower. Environmental attitudes was also significantly higher for students with Islamic religion (mean=34.56) while that of Christian religion (mean=32.94) was significantly lower. Furthermore, the mean of environmental attitude of students whose permanent residence were in urban areas (mean=33.44) was significantly higher while those in rural areas was significantly lower (mean=32.78).

In their studies, Mderrisođlu and Altanlar (2011) reported no change in students' environmental behaviours according to faculties. Ibrahim and Babayemi (2010) also recorded differences in attitudes based on religion. However, Budak *et al.* (2005) observed no significant differences in the environmental attitude of students based on residence while significant differences in students' attitudes based on membership of environmental organisations. In addition, significant difference existed in students' environmental behaviours based on school ($p<0.05$), age ($p<0.01$) and religion ($p<0.05$). Environmental behaviour of students in SET (mean=43.15) was significantly higher while that of SEMS (mean=37.51) was significantly lower. In addition, the environmental behaviour of students practising Islam (mean=42.72) was significantly higher while that of Christianity (mean=39.24) was significantly lower (Table 5). The result on differences in environmental behaviour based on age agrees with Hoskins and Sharp (2014) that found significant age differences in environmental behaviours of students.

Table 6 shows the results of the regression analysis between undergraduates' demographic characteristics and their environmental attitude. This study revealed that religion ($\beta=0.16$, $p<0.01$), childhood outdoor experience ($\beta=0.17$, $p<0.01$) and membership of Environmental NGOs ($\beta=0.13$, $p<0.05$) were the determinants of the undergraduates' environmental attitudes. Coefficient of determination is 47% ($R^2= 0.47$), in other words, 47% of the total variance of respondents' environmental attitude can be explained by their demographic characteristics. Palmer (1993) observed that the strongest predictor of environmental concern was the amount of outdoor experience as children. The findings of current study revealed that age, gender and ethnic group did not determine environmental attitude of the students.

Table 5: Demographic differences in students’ environmental attitudes and behaviours

Demographic factors	Attitudes		Behaviours	
	F	Sig. Level	F	Sig. Level
School Level	2.62	0.02*	2.45	0.03*
Age	1.22	0.30	1.25	0.29
Religion	1.70	0.05	2.36	0.01
Residence	4.51	0.01*	3.37	0.04*
Political affiliation	4.08	0.02*	0.42	0.66
Childhood outdoor experience	0.13	0.88	0.64	0.53
Parents wealth class	1.33	0.27	1.32	0.27
Ethnic group	2.38	0.07	0.87	0.46
	0.49	0.92	1.16	0.31
	T	Sig. Level	T	Sig. Level
Sex	-0.74	0.46	-0.20	0.84
Membership of environment related NGOs	2.00	0.05	1.20	0.23

*Tukey’s HSD indicating differences between groups

Table 6: Result of regression analyses between personal factors of students and their environmental attitudes and behaviours

Independent variables	Attitudes β(t-value)	Behaviours β(t-value)
Sex	0.07(1.35)	0.01 (0.17)
Age (years)	0.01(0.23)	-0.03(-0.54)
Religion	0.16(3.08)**	-0.09(-1.71)
Permanent residence	0.07(1.36)	0.03(0.56)
Ethnic group	0.11(0.22)	-0.10(-1.87)
Childhood outdoor experience	0.17(3.02)**	-0.06(-0.96)
Parents’ wealth	0.08(1.52)	0.01(0.20)
Membership of Environmental NGOs	0.13(2.43)*	-0.05(-1.02)
R	0.47	0.17
R ²	0.30	0.03
Adj. R ²	0.28	0.00
Std Error	0.12	0.24
R ² Δ	0.28	0.03
F. change	2.53	1.18
Df	366	3.66
Sig.	0.002	0.31

*p<0.05, **p<0.01

Table 7: Correlation between environmental attitudes and behaviours

Variable	Correlation value (r)	Decision
Environmental attitude	0.40**	Significant

**Correlation is significant at 0.01 probability level.

This is consistent with the findings of Henderson *et al.* (1998) who observed that the environmental attitude of students in tertiary institutions was not influenced by their gender. On the other hand, a contrary opinion by McMillan *et al.* (1997) revealed that gender had significant positive effects on environmental attitudes. Budak *et al.* (2005) also reported that students’ attitudes were not related to their age. The study further revealed that demographic factors were not significant predictors of environmental behaviours. This disagrees with Hadler and Haller (2011) and Marquart –Pyatt (2012) that found demographic variables as significant predictors of environmental behaviours. Table 7 revealed that there was significant

relationship (p<0.01) between undergraduates’ environmental attitudes and behaviours. This is consistent with Chan (1996) as well as with Chuleewan and Kongsak (2012) who observed that students’ environmental attitudes had significant relationship with their actual behaviour. Ajzen and Fishbein’s (2005) theory of reasoned action demonstrates a link between attitudes and environmental behaviours. Shetzer *et al.* (1991) however observed that the expressed environmental attitudes of the students do not reflect their actual environmental behaviours on the same level.

CONCLUSION AND RECOMMENDATION

The basic outcome of this study was that the students exhibited slightly higher environmental attitudes than their behaviour. Religion, childhood outdoor experience and membership of environmental oriented NGOs were found to be the determinants of students' environmental attitudes while only religion was observed as the determinant of environmental behaviour. Although, their attitudes were higher than behaviours, significant relationship was observed between students' environmental attitudes and their behaviours. The findings identified the importance of demographic factors in the respondents' attitudinal and behavioural development. Thus, attitudinal and behavioural traits should be considered in policies and programmes planning in tackling the myriads of environmental problems. Further studies are needed on other social and psychological determinants of environmental attitudes and behaviours.

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