CARITAS UNIVERSITY AMORJI-NIKE, EMENE, ENUGU STATE

Conceptualizing Environmental Literacy and Waste Disposal Behaviour of University Students in Nigeria. An Empirical Investigation

Nwankwo Christian
Abude Peter

Authors' Affiliation

[1]Department of Marketing
Caritas University Amorji-Nike
nwankwochristian23@gmail.com
08037643869

[2]Department of Entrepreneurship and Business Innovation
University of Delta, Agbor
abudepeter@yahoo.com

ABSTRACT

This study was on conceptualizing environmental literacy and waste disposal behaviour of university students in Nigeria. Environmental problems today are global in nature, requiring young and old alike to behave pro-environmentally in order to rectify environmental problems and prevent new ones from occurring. Environmentally literate people possess the knowledge and skills required to analyze environmental issues, which would enable the individual to behave pro-environmentally. The main objective of this study was to investigate environmental literacy and waste disposal behaviour of university students in Nigeria. To achieve this, the study hypothesized that despite the intensifying environmental education efforts and the spread of environmental literacy concept, there is still a growly discourse in literature on whether and how environmental literacy influence waste disposal behaviour of university students in Nigeria. Data were collected using structured questionnaire administered to four hundred students selected from universities in Enugu State, Nigeria. Structural equation modeling was used to test the hypotheses at .05 margin of error. Statistical package for social sciences (SPSS) version 23.0 software was used for analysis, the findings shows that there was no relationship (positive) between environmental knowledge and waste disposal behaviour of university students. The paper concludes that students who are environmentally knowledgeable, curious, with locus of control concerned and sensitive to the environment are needed to manage the impact of human excesses on the environment. It is recommended that environmental programmes should be infused into the academic curriculum for university students to enable them acquire more environmental knowledge to walk the talk.

1. INTRODUCTION

In recent years, environmental issues have become one of the important concerns of the society (Gokhan, Ozgili & Gaye, 2013). Environmental literacy has been pronounced as one of the most important aspects to be considered for managing environmental problems since 1970s. importance and requirement of education in solving environmental problems and developing environmental literacy of future generations have been emphasized at each international conference (Brundlant Report, 1987; Johannesburg Summit 2002, Rio Conference, 1992, Stockholm Conference, 1972), which are known as the milestones in environmental agenda.

Originally, literacy is a term that refers to the ability to read and write (Cambridge, 2018) in recent years it has been extended to variety of definitions such as computer literacy, science literacy, cultural literacy, etc. Considering literacy in the context of environment, environmental literacy was defined as the capacity of taking suitable action for the stability, sustainability and the development of environment (Roth, 1992, Spinola, 2016) and accepted as one of the major goals of environmental education (Roth, 1992, United Nations Education, Scientific and Cultural Organizations – UNESCO, 1980). In other words, environmentally literate persons shows actions towards environment by using necessary knowledge, skills, locus of control and sensitive to the environment (Roth, 1992; Peterson Bondel & Stevenson, 2013).

Similarly, according to Kinmaman (2015), Seth, Noath and Katharine (2013) waste disposal behaviour refers to the destruction or storage of waste materials in such a way that the impact on the environment and the society is minimized. Waste disposal behaviour is one area of social science that has received considerable attention due to the many environmental problems (global warming, pollution, exhaustion of resources and so forth) currently affecting the world. Studies in this area have included studies such as reduction of energy consumption (Tracy & Oskamp, 1984; Stern, 1992) sustainability marketing (Peattie & Belz, 2010) waste disposal behaviour and environmental literacy (Nkamnebe & Nwankwo, 2019) water pollution and waste disposal (Ebreo & Vining, 2002).

The environment provides the materials and energy required to meet the basic needs and desires of individuals and society, but the environment is being treated with disdain. Literature suggests that as a solution or to curb the emerging destructive environmental problems ravaging the ecosystem, the society need to be environmentally literate (Hsu & Roth, 1996, Olson, Roth & King, 1992; Wike, 1995; Erdogan, 2009). This is because environmentally literate citizens will behave in more responsible way in protecting the environment and tend to perform more responsible environmental behaviours (Stevenson, 2007).

Indiscriminate waste disposal by university students constitute one of the major challenges that impede the prospect of the philosophy of environmental education (Okoye et al; 2015). Neglecting this aspect of learning process would dastardly negate the frantic efforts of Nigeria's environmental policy objective which is to achieve sustainable development in the county (Eheaza, 2017; FGN, 2017). Furthermore, there are large number of variables that actually influence waste disposal behaviour of university students. Berno, Middleton and Meinhdt (2006) and Carl (2015) summarized these variables to include the following; environmental knowledge, locus of control, environmental curiosity, environmental sensitivity and environmental concern; these variables play a part in individual's process of pro-environmental adoption (Jickling, 2006; Sauve, 2014).

In view of the identified variables, this study categorically states that literacy about the environment in terms of not only reading and writing, but also an integrative way of how university students think, talk about, interact and value the environment, dispose waste properly. In the light of the foregoing, this study considers students' waste disposal an environmental problems that must be addressed if the desirable objectives of developing environmental literacy for future generation would be achieved. This is in essence triggered this study.

Statement of the Problem

In Nigeria today, waste disposal is facing numerous challenges because university students, households dispose waste indiscriminately. One of the reasons for this anti-pro-environmental behaviour is lack of environmental knowledge. This is because environmental knowledge will lead to behavioural

change when it is encouraged by education (Finger, 1994).

According to Owusi, Matthew and Ofori (2017), students' involvement in pro-environmental behaviour is low in Nigeria despite the fact that university students are the starting point of sustained change and action toward the environment. Recent studies also suggests that university students are found to be good predictors of the actual involvement in activities that promote sustainable and responsible environmental behaviour and environmental literacy of these students will influence their parents towards pro-environmental behaviour (Williams, 2017; Eheazu, 2014; Tugen et al; 2010; Nkamnebe, 2018). In addition the behaviour of these students has received increasing attention among marketers (Lee, 2011). To understand this segment, it is important to know what factors influence their waste disposal behaviour.

Evidence in extant literatures (see Williams, 2017; Frazen & Kings 2017; Clores & Nunez, 2017; Zhang, 2011; Mwilu, 2006; Septu, 2009) identified factors to conceptualize environmental literacy and waste disposal of students which includes environmental knowledge, environmental curiosity, locus of control, environmental concern, and environmental sensitivity.

Kast, Wolfing and Tanner (2004) also opined that individual and situational factors influence the likelihood of students' knowledge and motivation to act pro-environmentally, so students' behaviour is influenced by multiple factors; and it is hard to detect which factors influences the most. Besides, the main weakness of the previous studies was the failure to address how these factors are important for understanding the behaviour of university students as it relates to environmental literacy and waste disposal. It is against this backdrop that this paper aims to fulfilling the knowledge gap concerning students' environmental literacy and waste disposal.

Objectives of the Study

1. To examine how environmental knowledge influence waste disposal behaviour of university students in Nigeria.
2. To ascertain the effect of locus of control on waste disposal behaviour of university students in Nigeria.
3. To discuss the relationship between environmental curiosity and waste disposal behaviour of university students in Nigeria.

4. To identify the relationship between environmental sensitivity and waste disposal behaviour of university students in Nigeria.

5. To explain the relationship between environmental concern and waste disposal behaviour of university students in Nigeria.

Hypotheses

H_1: There is a positive significant relationship between environmental knowledge and waste disposal behaviour of university students.

H_2: There is a positive significant relationship between locus of control and waste disposal behaviour of university students.

H_3: There is a positive significant relationship between environmental curiosity and waste disposal behaviour of university students.

H_4: There is a positive significant between environmental sensitivity and waste disposal behaviour of university students.

H_5: There is a positive significant relationship between environmental concern and waste disposal behaviour of university students.

LITERATURE REVIEW

Concept of Environmental Literacy and Waste Disposal

Environmental literacy as a human discourse does not have a consensus definition despite the efforts of scholars over the past decades. Reasons adduced for this lack of consensus definition is diverse opinions of ecologists and environmental scholars (McBride, 2011; Orr, 1992; John, 2014). However, Roth (1992) defined environmental literacy as essentially the capacity of individuals to perceive and interpret the relative health of environmental systems and take appropriate actions to maintain, restore or improve the health of those systems. Also Noris (2016) simply defined environmental literacy as an understanding of the interaction of human beings and their natural environment with regard to

both living and non living things. The nexus of these definitions was to make people more knowledgeable about the environment and its associated issues with the view that being knowledgeable will lead to a change in behaviour.

Furthermore, waste disposal behaviour refers to the destruction or storage of waste materials in such a way that the impact on the environment and on the society is minimized (Kinharman, 2015; Noar, Seth & Katharine, 2013). In the same vein, waste is any material which the owner discard or intend to discard, or it can basically be referred to as any material considered to be useless which means it is no longer needed for its intended or primary purpose (Hoornweg & Tan, 2012; Ahmed, 2008; Okoye et al; 2015).

Theoretical Background

Theory of Environmentally Responsible Behaviour (ERB)
This paper is anchored on the theory of environmentally responsible behaviour by Tomera (2013). The theory postulates that environmental knowledge, locus of control, environmental curiosity, environmental sensitivity and environmental concern will influence whether a person adopt proper waste disposal behaviour or not. The ERB framework is founded on two basic assumptions. First, students are predisposed to pro-environmental behaviour when they are environmentally literate. Second, students' waste disposal behaviour is influenced by multiple factors and it is not easy to detect which one influence the most.

Empirical Review

Matthew, Owusu, Kwakye, Ofori and Welbeck (2017) conducted a study on environmental literacy and waste disposal of business students in Ghana. The study also investigates the relationship between students' interests in environmental issues and knowledge levels of environment and assesses how these two constructs influence students overall environmental behaviour and actions. Using a total of 591 business students from the University of Ghana Business School, the study uses exploratory factor analysis to examine the multidimensionality of environmental literacy concept. A structural equation modeling approach was used to examine the relationship among the study constructs. Findings indicate that there is a relationship

(positive) between students' interests in environmental activities and their environmental literacy level. Also, interest in environmental activities and literacy level were found to be good predictors of the actual involvement of students in activities that promote sustainable development.

Williams (2017) in his study assesses environmental literacy and waste disposal behaviour among Oklahoma Public High School and the factors affecting students' environmental literacy in United States of America. Questionnaire was used to collect primary data from the respondents. Findings reveal that anti-environmental conservative beliefs are deeply rooted in the Oklahoma students' culture and the rejection of scientific principles of leaders in the community.

Don, Juliet and Erhabor (2016) statistically conducted a study on impact of environmental education, the knowledge and attitude of students towards environment in Nigeria. Survey research method was adopted with a structured questionnaire used to collect primary data. Findings show that there is a high level of knowledge and positive attitude towards the environment among the students and to have more environmental literate students in Nigeria, more need to be done to promote and encourage environmental education at all levels in the county especially by the government and its agency to ensure the effective implementation.

Lin and Huang (2014) carried out a study on university undergraduate students' attitudes towards biodiversity in America and Taiwan students. Questionnaire was used to collect primary data from the respondents. The t-test was conducted to examine the difference among the students of different backgrounds. The findings show that both American and Taiwanese undergraduate students indicates lower level of confidence in the ability of science and technology to solve biodiversity problems.

Donavan (2001) conducted an empirical study to evaluate twelfth grade students environmental knowledge in Texas USA. The study employs survey research method with questionnaire as the instrument for primary data collection. As reported within the context of the study, the findings reveals that there were positive relationship between

environmental knowledge and behaviour of the students.

METHODOLOGY

This study adopts and used survey research design using the questionnaire as the major instrument for data collection. The instrument consists of 29 items to measure the level of environmental literacy and waste disposal behaviour of university students in Enugu State, Nigeria. It consists of two parts: Part A measures the demographic characteristics of the respondents while Part B measures the major constructs of this study using a five point likert scale of Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree.

The sample size for this study was 400 respondents statistically drawn from a population of 69,091 university students using slovin's formula. This study adopts the stratified random sampling or representative sampling procedure in selecting the sample units.

This study used both primary and secondary sources of data. The primary data were collected with the aid of a well structured instrument whereas the secondary data were elicited from journals, internet sources, archival records, and non written documents. These data collected were analyzed with the aid of statistical package for social sciences (SPSS) version 23.0 software. Analysis was done in two parts: descriptive and inferential statistics. The multiple linear regression was done with structural equation modeling with the aid of Analysis of Moment Structures (AMOS 23) software.

DATA ANALYSIS

Table 4.1: Demographic characteristics of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	165	44.8	44.8	44.8
	Female	203	55.2	55.2	100.0
	Total	368	100.0	100.0	
Age	18-20 years	66	17.9	17.9	17.9
	21-25 years	138	37.5	37.5	55.4
	26-30 years	164	44.6	44.6	100.0
	Total	368	100.0	100.0	
Ethnicity	Igbo	301	81.8	81.8	81.8
	Hausa	37	10.1	10.1	91.8
	Yoruba	30	8.2	8.2	100.0
	Total	368	100.0	100.0	
Religion:	Christianity	317	86.1	86.1	86.1
	Islam	51	13.9	13.9	100.0
	Total	368	100.0	100.0	

Source: Field Survey, 2024

From table 4.1, 165 (44.8%) of the respondents were males while 203 (55.2%) are females. On age bracket, 66 (17.9%) are within the age of 18-20 years; 138 (37.5%) are within the age bracket of 21-25 years; while majority of 164 (44.6%) are within the age bracket of 26-30 years. On ethnicity, majority of the respondents 301(81.8%) are Igbo, 37 (10.1%) are Hausa, while the remaining 30 (8.2%) are Yoruba. This is informed by the fact that the study was conducted in an Igbo dominated area. On religion, 317 (86.1%) are Christians while the remaining 51 (13.9%) are of the Islamic faith. Again Enugu State is Christian dominated hence the high response from Christianity. Next we present the responses to the items used to measure the various constructs.

Table 4.2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
EK1	368	2	5	4.35	.716	-1.311	.127	2.412	.254
EK2	368	1	5	3.56	1.152	-.567	.127	-.798	.254
EK3	368	1	5	3.27	1.253	-.177	.127	-1.116	.254
EK4	368	1	5	3.74	1.129	-.912	.127	.119	.254
EK5	368	1	5	3.00	1.661	.098	.127	-1.687	.254
LoC1	368	1	5	3.25	1.290	-.193	.127	-1.170	.254
LoC2	368	1	5	3.02	1.278	-.064	.127	-1.293	.254
LoC3	368	1	5	3.60	1.172	-.672	.127	-.502	.254
LoC4	368	1	5	3.36	1.214	-.607	.127	-.703	.254
LoC5	368	1	5	3.08	1.391	-.289	.127	-1.217	.254
LoC6	368	1	5	3.27	1.306	-.082	.127	-1.277	.254
EnCur1	368	3	5	4.33	.509	.290	.127	-.946	.254
EnCur2	368	1	5	4.11	1.058	-1.280	.127	.817	.254
EnCur3	368	1	5	3.92	1.050	-1.096	.127	.766	.254
EnCur4	368	1	5	3.23	1.343	-.046	.127	-1.402	.254
EnCon1	368	3	5	4.31	.582	-.169	.127	-.602	.254
EnCon2	368	1	5	3.72	1.347	-.508	.127	-1.286	.254
EnCon3	368	1	5	4.26	1.100	-2.002	.127	3.497	.254
EnCon4	368	1	5	3.81	1.190	-1.116	.127	.388	.254
EnCon5	368	1	5	3.03	1.412	-.042	.127	-1.335	.254
EnCon6	368	1	5	3.71	1.160	-.898	.127	.136	.254
EnSen1	368	1	5	3.74	.967	-1.013	.127	.895	.254
EnSen2	368	1	5	2.55	1.328	.387	.127	-.937	.254
EnSen3	368	1	5	3.73	1.190	-1.116	.127	.414	.254
EnSen4	368	1	5	4.12	.867	-1.917	.127	4.987	.254
WDB1	368	1	5	4.43	.716	-2.094	.127	7.736	.254
WDB2	368	2	5	4.26	.600	-.778	.127	2.572	.254
WDB3	368	1	5	3.55	1.392	-.851	.127	-.653	.254
WDB4	368	1	5	3.96	1.017	-1.039	.127	.446	.254
Valid N (listwise)	368								

Source: SPSS V23.0 2024

Table 4.2.present the information requested for each of the items used to measure the variables of the study. The next two columns show the minimum and maximum and the highest under maximum is 5 while the least under minimum is 1. This is a confirmation that the variables were measured with five-point scale coded one to five. Also from the table, all the items have mean range from 2.55 and above up to 4.54 among other means values while most of the standard deviation values are above one. Standard deviations measure variability hence with standard deviations above one for items measured with five point likert scale is an indication that the respondents are not in agreement as their opinions are diverse.

Descriptive also provides information concerning the distribution of the scores on continuous variables (skewness and kurtosis) (Pallant, 2016). These information are necessary if the variables are to be used in parametric statistical techniques (e.g. Pearson correlation, t-tests, and covariance structural equations modeling (CB-SEM) which is the situation in this study. The skewness value provides an indication of the symmetry of the distribution. Kurtosis on the other hand provides information about the "peakedness" of the distribution. Positive skewness values indicates positive skew (scores clustered to the left at the low values). Negative skewness indicates a clustering of scores at the high end which is the situation with our data. Positive kurtosis values indicates that the distribution is rather peaked (clustered in the centre), with long thin tails. Kurtosis values below 0 indicate a distribution that is relatively flat (too many cases in the extremes). In table 4.2 the skewness of the items are mixed with very high values and very low values. Also the kurtosis show very high and very low or values below zero. This implies that there is a mix of peakedness and flattened values in the items.

Regression Results of Hypotheses Testing

	Estimate	S.E	C.R	P	Lable
ZWDB <--- ZEK	.013	.007	1.884	.060	Not Supported
ZWDB <--- ZLoC	.126	.036	3.478	***	Supported
ZWDB <--- ZEnCur	-.310	.089	-3.476	***	Supported
ZWDB <--- ZEnCon	-.086	.026	-3.242	.001	Supported
ZWDB <--- ZEnSen	-.466	.180	-2.598	.009	Supported

H_1: There is a positive relationship between environmental knowledge and waste disposal behaviour of university undergraduates.
The path ZWDB <--- ZEK has a coefficient of .013; critical ratio (CR) = 1.884 and p-value of .060 which is above the .05 margin of error hence hypothesis one is rejected.

H_2: There is a positive relationship between locus of control and waste disposal behaviour of university undergraduates.

The path ZWDB <--- ZLoC has a coefficient of .126; critical ratio (CR) = 3.478 and p-value of .000 which is well below the .05 margin of error hence hypothesis two is accepted and validated.

H_3: There is a positive relationship between environmental curiosity and waste disposal behaviour of university undergraduates.

The path ZWDB <--- ZEnCur has a coefficient of -.310; critical ratio (CR) = -3.476 and p-value of .000 which is well below the .05 margin of error hence hypothesis three is accepted and validated.

H_4: There is a positive relationship between environmental sensitivity and waste disposal behaviour of university undergraduates.

The path ZWDB <--- ZEnSen has a coefficient of -.466; critical ratio (CR) = -2.598 and p-value of .009 which is well below the .05 margin of error hence hypothesis four is accepted and validated.

H_5: There is a positive relationship between environmental concern and waste disposal behaviour of university undergraduates.

The path ZWDB <--- ZEnCon has a coefficient of -.086; critical ratio (CR) = -3.242 and p-value of .001 which is well below the .05 margin of error hence hypothesis five is accepted and validated.

Findings

The study revealed the following:

1. There is no positive relationship between environmental knowledge and waste disposal behaviour of university undergraduates this led to rejection of hypothesis one.

2. Locus of control is positively related to environmentally responsible behaviour and provides people with the belief that they can do something to preserve the environment.

3. There is a positive relationship between environmental curiosity and waste disposal behaviour of university undergraduates, which led to acceptance of hypothesis three.

4. There is a positive relationship between environmental sensitivity and waste disposal behaviour of university undergraduates which led to the acceptance of hypothesis four.

5. There is a positive relationship between environmental concern and waste disposal behaviour of university undergraduates, which led to the acceptance of hypothesis five in chapter one.

CONCLUSION AND RECOMMENDATIONS

The following recommendations are proffered.

1. Since there was no positive relationship between environmental knowledge and waste disposal behaviour, this study recommends that environmental programmes be infused into the academic curriculum for university undergraduates to enable them to fully appreciate these environmental issues and stimulate action.

2. All university undergraduates should have internal locus of control to bring about behavioural change in the environment. This they can do by understanding of the importance of sustainability, where emphasis is laid on inquiry-based problem approaches, interdisciplinary and critical thinking as well as using relevant cases studies and indentifying best practices. For instance, Department of Marketing, Nnamdi Azikiwe University, Awka Nigeria has sustainability marketing as a course, the focus is on considering values and ethics associated with sustainability issues.

3. University undergraduates should be curious about the environment. This will influence their behaviour in both positive ways at all stages of their life cycle. As a trigger of learning, it will push students to learn more about the environment.

4. University undergraduates should be sensitive to environmental issues. This they will do by being emphatic, caring and having positive feelings towards the environment.

5. University graduates should show higher environmental concern. This they do by embracing the new environmental paradigm and rejection of mastery of nature.

We therefore conclude that since university students lack knowledge about the environment efforts should be made to infuse environmental literacy / sustainability marketing into the University curriculum to regreen the already degreened environment and walk the talk.

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