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College Students' Skills and Motivation in Solid Waste Management: Implications for Environmental Education

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Abstract. This study assessed colleges of education students' skills and motivation towards solid waste management in the North Central Zone of Nigeria. The cross-sectional survey design was adopted in the study and a sample of 1, 800 NCE three students from six sampled colleges of education in the north central zone of Nigeria used. Two research questions were raised and two hypotheses formulated to guide the study. Students' Skills and Motivation towards Solid Waste Management Questionnaire was used for collecting data from students. The instrument was validated by three experts, one, a director from the Plateau State Environmental Protection and Sanitation Agency, the others, professors in science education and research, measurement and evaluation, respectively, from the faculty of education, University of Jos, Nigeria. The construct validity was established using factor analysis while the reliability index of 0.85 was determined using the Cronbach alpha method. Frequency, mean, standard deviation and percentage were used to answer the research questions while t-test and Pearson product moment correlation coefficient were used to test the hypotheses at 0.05 level of significance. Findings showed that, colleges of education students had low levels of skills and motivation, respectively, in solid wastes management. Science major students were found to be more motivated than the non-science major students. There was also a significant relationship between students' levels of skills and motivation in solid waste management. Findings imply that teachers should inculcate requisite waste management skills in in environmental/geography education students and motivate them to apply such skills in managing solid wastes in and outside college premises for environmental sustainability.

Keywords: Assessment, Environmental Education, Motivation, Solid waste management Skills, Sustainability.

1. Introduction

The challenge of managing solid waste due to astronomical growth in human population and subsequent waste generation is daunting and a threat to sustainable environment in the sub-Saharan African region. Solid waste is littered often in large heaps in urban and rural areas, near students' settlements, dormitories and offices in college premises. This, more often than not, results in blocked drainage systems and breeding grounds for disease vectors.

Over the last decade, most Nigerian cities have been grappling with the challenges of managing their solid wastes as a result of phenomenal growths in population and waste generation. It has been reported that the population in some States and Local Government capitals is growing by as much as 20-30% per annum (World Bank, 2000 & Ezeah, 2010). Solid waste management in cities and institutions of learning (colleges of education inclusive) is still in its infancy. Institutional and policy frameworks were they exist are not in line with global best practices. City specific data on waste necessarily for planning are also not readily available (Akoni, 2007).

A look around the study area revealed a lot of environmental problems such as pollution, deforestation, erosion, solid waste management, environmental degradation and global warming among others. Solid wastes such as used polythene

bags, empty bags of sachet water, plastics, food wrappers, cartons of soft drinks and papers are littered around in large heaps near dormitories and offices in the college premises which often block drainages. These waste materials are either blown by wind or washed by rain water into dormitory areas and college compounds often resulting in breeding ground for vectors of diseases such as mosquitoes, rats, house flies among others. The college farms and uncompleted buildings around the college premises most often are littered with sewage. The solid waste and refuse dumps are not cleared or inadequately managed as the case may be. There is a laissez-faire attitude by students towards the issue of solid waste management on the campus. This leaves the researchers in doubt with regard to the knowledge of the health implications or hazards of such unhealthy environment by students of the colleges.

The consequence of not addressing this environmental problem of solid waste poses various threats to the public health of members of these colleges of education communities and may adversely affect flora and fauna as well as the environment, especially when it is not appropriately collected and disposed off. Furthermore, environmental efforts by the college management directed at safeguarding the health of citizens besides, the clamour for environmental awareness and practices, especially from the account of environmental movements seem not to have achieved much success due to individual environmental behaviours. In other words, solid waste management is a serious problem in Nigeria. It is an important environmental health service and an integral part of basic urban services. This is because the health implication of poor waste management can be very devastating to the people exposed to unhealthy environmental conditions. Diseases such as cholera, typhoid, dysentery and malaria are also related to the practice of poor waste management. This can result in the loss of human resources needed for the development of the country.

Researches over the years have shown that most of the studies on environmental education were on pre-school, primary, secondary school students and part of it on university students (Sama, 2003; Erol & Gezer, 2006 & Kofoworola, 2007). However, the variables of skills and motivation of students of colleges of education in Nigeria towards solid waste management do not seem to have been given the emphasis they deserve

In response to the serious challenges posed by the ravaging effects of pollution, deforestation, desertification, erosion, solid waste management, and sundry manifestation of environmental degradation, the Federal Government of Nigeria enacted the National Environmental Standard and Regulation Enforcement Agency (NESREA) Act of 2007 through the Federal Ministry of Environment to replace the Federal Environmental Protection Agency Act. The agency provides authority to ensure compliance with environmental laws, local and international, on environmental sanitation and pollution prevention and control through monitory and regulatory measures. Despite the effort by the government in addressing the issue of solid waste management and disposal in Nigerian cities, much still need to be done to ensure environmental protection, safety and sustainability in Nigeria.

Environmental Education (EE) is not stated clearly in the vision of the Federal Ministry of Education (FME). It is rather seen as a cross cutting theme within the nation's curricular for both primary and secondary schools and the National Minimum Standards (NMS). Nevertheless, the Minimum Standards for Colleges of Education have undergone a series of reviews to make the curriculum relevant, while meeting the demands of the Universal Basic Education Commission (UBEC). This has been by increasing the workload in Primary Education Studies (PES), and the infusion of Environmental/Conservation Education as a theme into the present General Studies in Education (GSE) curriculum. These courses are made compulsory for all prospective Nigeria Certificate in Education (NCE) holders in addition to the subjects of specialization. Also, EE is infused into subjects like Integrated Science, Biology, Geography and Geology in the sciences and some aspects of arts and social sciences (Dung, 2018) in a bid to inculcate environmental consciousness and friendliness in students. However, the question is whether the content of the NMS offered by the students of colleges of education adequately equips them with the skills and motivation to effectively manage solid wastes while in college and carry out teaching and learning of environmental concepts on graduation. The colleges of education in Nigeria are also entrusted with the task of molding students to be responsible members of the society. It is crucial that teachers are the front liners in establishing and sustaining the culture of environmental consciousness in the society. Moreover, education should make young people aware of environmental problems ((Akinbote, 2007; Ibrahim & Babayemi, 2010).

For this to be done in any significant way, there is the need to collect baseline data on students'

understanding of the teacher training programme in colleges of education, particularly on their awareness about environmental problems through education because solid waste management activities in colleges of education campuses involve the students as part of their learning process. The particular skills and motivation gained from Environmental Education would help in changing their behaviour towards the environment. Hence, the need to assess colleges of education students' skills and motivation towards solid waste management in the north central zone of Nigeria. This study was therefore, motivated by the need to fill the gaps in skills and motivation by generating empirically tested data on solid waste management in colleges of education that could underpin future solid waste management strategies /sustainability and policies in colleges of education. The theoretical framework of this study was based on the Theory of Planned Behaviour (TPB) propounded by Ajzen and Fishbein (1980). The TPB states that, what an individual does is determined by personal motivation. The objectives of the study were to assess the skills and motivation of college of education students towards solid waste management. To achieve these objectives, the following research questions were raised and hypotheses formulated:

What is the level of students' skills in solid waste management? What is the extent of students' motivation towards solid waste management? There is no significant relationship between skills acquired by students and their motivation in solid waste management; there is no significant difference between motivation of students who are science major and students who are non-science major.

2. Research Methodology

The research design employed in this study was the cross-sectional survey design. The population of the study comprised 8,808 NCE three students in 14 colleges of education in north central zone of Nigeria. A sample of 1,800 students from six colleges of education representing 43.00% of the population of colleges of education in the north central zone of Nigeria was used (Two federal colleges of education with 1126 students, two state colleges of education with 468 students and the two private colleges of education with a sample 206 students). The stratified sampling technique was used to obtain six colleges from the population of fourteen colleges of education in the north central zone of Nigeria with a sampling fraction of 0.02.

The SSMSWMQ comprised of two sections namely A and B. Section A elicited information on demographic variables of respondents, such as, gender, age, school/Institution, department of students. Section B consisted of two sub-sections namely: SSSWMS, with 20 items respectively, while SMSWMS consisted of 25 items on intrinsic motivation, Career motivation, Self-determination, Self-efficacy and Grade motivation each with five items, respectively. The items were drawn on students' skills and motivation on solid waste management in Environmental Education. In developing this instrument, the core principles of attribution theory of ability, efforts, luck and task difficulty was taken into consideration. Seven items were developed on students' ability, six on efforts, four on task difficulty and three on luck.

The instrument was structured based on the five points Likert rating scale ranging from Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (DA) and Strongly Disagree (SD). The values alloted to the options are 5,4,3,2 and 1 for positive items (from strongly agree to strongly disagree) and 1,2,3,4 and 5 for negative items, respectively. However, students' responses to SMSWMS were used to categorize them as having high, moderate and low motivation levels. The standard for rating was generated from the average values of five point Likert scale as follows: 1+2+3+4+5 = 15/5 = 3 (average value). Respondents with score of (4.00 and above) on the SMSWMS were regarded as having high level of motivation, those with 3.00-3.99, as having moderate level of motivation while those with 0-2.99 were regarded as having low level of motivation. The instrument was administered in two hours.

The content of the SSMSWMQ was developed by taking into consideration the specific objectives, research questions and hypotheses that guided the study. The SSMSWMQ was structured based on the five point Likert rating scale with Strongly Agree (SA) Agree (A) Undecided (UD) Disagree (DA) and Strongly Disagree. The respondents were required to tick the appropriate column indicating the level of agreement provided. The development of SSMSWMS was guided by the following steps:

- A careful study of the objectives the research intended to achieve which include the investigation of skills of solid waste management and to determine the level of motivation of students studying environmental education related courses,
- A review of relevant literature on instruments development to find out how the items of SSMSWMQ were developed,

- Consultation of experts in the field of environmental education and psychology on how an instrument of this nature could be developed,
- A careful study of the environmental education concepts in the National Minimum Standards for Colleges of Education,
- Generating items of SSMSWMQ from the course content areas of the National Minimum Standards to take care of students' awareness on solid waste management practices in colleges of education,
- Editing the SSMSWMQ items taking into consideration the length of the items, appropriate wordings, adequacy of language level and item arrangement,
- The SSMSWMQ instrument was finally subjected to expert scrutiny which guided the final production of the items of the instrument.

The construct validity of the instrument Students' Skills and Motivation towards Solid Waste Management Questionnaire (SSMSWMQ) was determined using factor analysis as 0.90. In order to validate this instrument, copies of the instrument were subjected to the scrutiny of three experts namely: a director from the Plateau State Environmental Protection and Sanitation Agency (PEPSA), a Professor in Science and Technology Education Department, University of Jos, and a Professor in Test and Measurement from the Department of Educational Foundation, University of Jos. They were given the items to judge how adequately the items measured the construct students' skills and motivation towards solid waste management. They also scrutinized the items in terms of wordings. The independent assessment of the experts was used to produce the final copy of the instrument. The construct validity of SSMWQ was determined using factor analysis method, a statistical technique that was used to reduce large number of items to smaller number, known as factor. The implication of this was to establish the factor structure of the instrument.
The reliability of SSMSWMQ was determined using the Cronbach alpha coefficient method as 0.85

The instrument was trial-tested in college of education Kaduna state, using 60 NCE three students that were not part of the sample used in the main study in the north central zone of Nigeria. However, they had similar characteristics with the sample for the main study. The test was administered on the students once. The analysis of the result was done using Statistical Package for Social Science (SPSS) software version 23.0. Frequency, mean and standard deviation were used for answering the research questions while Pearson product moment correlation coefficients (r) were used to test the hypotheses.

3. Results

The results were presented on the bases of research questions and hypotheses that guided the study.

Research Question One: What is the level of students' skills in solid waste management?

Table 1: Mean Analysis Responses of Colleges of Education Students on the Level of Skills towards Solid Waste Management

		Rating scores	Frequency	Percent	Valid Percent
Valid	High	76- 100	323.00	17.90	17.90
	Moderate	68-75	585.00	32.50	32.50
	Low	0-67	892.00	49.60	49.60
	Total		**1800.00**	**100.00**	**100.00**

The analysis in Table 1shows the mean responses scores of colleges of education students on their skills acquisition in solid waste management. The result is categorized into high level, moderate level and low levels, of skills acquisition with a rating or 76-above, 68-75 and 67-less respectively. However, the analysis reveals that colleges of education students have the following frequencies and percentages scores; high level of skills acquisition has a frequency of 323.00 with a percentage score of 17.90%, moderate level skills acquisition has a frequency of 585.00 with a percentage of 32.50% while low level of skills acquisition has a frequency of 892.00 with a percentage of 49.60% respectively. From this analysis the result revealed that students generally have Low level of skills acquisition in solid waste management.
Research Question Two: What is the extent of students' motivation towards solid waste management?

Table 2: Mean Analysis of Students Responses on Level of Motivation towards Solid Waste Management

		Rating Scores	Frequency	Percent	Valid Percent
Valid	High	87-100	649.00	36.10	36.10
	Moderate	76-86	224.00	12.40	12.40
	Low	0-75	927.00	51.50	51.50
	Total		**1800.00**	**100.00**	**100.00**

Table 2 shows the responses of colleges of education students as categorized into high, moderate, and Low levels of motivation rating from 87- and above, 76-86 and 75 and less, respectively. The analysis shows that colleges of education students had high level of motivation towards solid waste management with a frequency of 649.00 with a corresponding percentage of 36.10%, moderate level has a frequency of 224.00 with a percentage of 12.40% while Low level of motivation has a frequency of 927.00 with a percentage of 51.70% respectively. This result revealed that students of colleges of education have low level of motivation towards solid waste management.

Hypothesis One: There is no significant difference between motivation of students who are science major and students who are non-science major.

Table 3: Analysis of Difference in Motivation between Science Major and Non-Science Major Students

Category	No. of Students	□	SD	df	p-value (2-tailed)
Science major	1127.00	78.70	22.90	1763.00	
Non-science major	638.00	73,10	24.50	1252.00	0.000

The analysis in Table 3 shows that Science Major Students' recorded a mean of 78.70 and standard deviation of 22.90, with a p-valued of 0.000 while the Non-Science Major students recorded a mean of 73.10 with a corresponding standard deviation of 24.50and a p-value of 0.000 respectively. From the result, it is revealing that mean differences in motivation of 5.60 exist between the science Major students and Non-Science Major Students' in favour of the science major students and a p-value less than 0.05 level of significant. This means that, the science major students are more motivated than the Non-Science Major students in solid waste management.

Hypothesis Two: There is no significant relationship between skills acquired by students and their motivation in solid waste management.

Table 4: Correlation Analysis between Level of Skills and Student Motivation towards Solid Waste Management

Variable	No. of students	*r*	P-value (2- tailed)
Skills	1800.00	-0.29	0.000
Motivation	1800.00		

Significant at P< 0.05

The result in Table 4 shows the relationship between students' level of skills and their motivation towards solid waste management. The score (-0.29) reveals that there was a significant relationship between the levels of skills of students of college of education in north central zone of Nigeria and their motivation in solid waste management. This is because the p-value of 0.000 is less than the level of significant 0.05. Hence there is no enough evidence to retain the null hypothesis. The result was categorized into high level of skills acquisition, moderate and low levels with a rating of 76 above, 86-75 and 67-less respectively. The analysis showed high level of skills with a frequency of 323.00 and a percentage of 17.90%, moderate level has a frequency of 585.00 with a percentage of 32.50% and low level has a frequency of 892.00.with a percentage of 49.60% respectively. The result revealed that colleges of education students generally have low level of skills acquisition in solid waste management. This is not surprising as it was evident in students' low mean scores to some items of the instrument which they accepted, that, metals cannot be recycled into other useful products, they did not agree that solid waste can be sorted into glasses and recycled and also they did not engage in compost formation for agricultural purposes. However students when exposed to a kind of cooperation with the immediate community that

permits them to be associated with the community in environmental quality understanding. This involves going out of the classroom, observing, studying and working directly in the fields or with community groups. This activity could be in the industries, factories and or any organization to acquire the necessary skills and their picture of environmental solid waste management is seen and the need for everyone having a responsibility to see that government controls and or policies are formulated to minimize the environmental waste as the case may be. This finding is in agreement with the suggestions of Eguabor (2012) that to improve on students' skills acquisition, students should keenly and seriously take part in extracurricular activities and this provides many learning opportunities which are likely to build their skills.

The findings revealed a significant relationship between the level of skills of colleges of education students and their motivation in solid waste management. This is in line with Olawepo and Jekayinfa (2011) who discovered that most of the teachers (86.10%) disclosed that they engaged in desirable environmental skill practices while only a few of them (13.90%) displayed environmental skills acquisition practices. They further, stated that there was a need to provide opportunities to acquire the skills and commitment required to protect and improve the environment.

Findings reveal that students of colleges of education generally had low level of motivation toward solid waste management. This was glaring from the responses of students to the instrument which recorded low mean scores on items like, the use of strategies to learn about solid waste management, the students did not care much in spending much time to learn more about environmental related issues and ways of tackling them, they admitted that they were not interested in coming up with a career in solid waste management and they did not show more interest in learning about environmental education. This result is in line with the findings of Mankilik and Usman (2017) who supported the improvement of high motivation by internal forces that activate a person to translate into performing what a learner would not naturally do.

Findings showed that science major students were more motivated than the non-science major students in solid waste management. Probably, this might be as a result of their disposition in the science discipline considering the effects and danger in the future as a result of solid waste accumulation and the negative effects of environmental issues in general. The implication is that the teacher has the role of enhancing students' motivation towards solid waste management by creating and maintaining successful expectations.

This finding is in agreement with the findings of Feldman (2005) in which he concluded that, motivation is seen as a factor that directs and energizes the behaviour of humans and other organisms, as well as initiates and sustains the same behaviour to satisfy physiological or psychological needs. This statement was further buttressed by Anakwe (2009) in his findings that there are specific actions that teachers can adopt in the class to increase students' motivation on tasks. Furthermore, these actions are intrinsic and extrinsic motivation.

References

Akoni, J. (2007). *Municipal Solid Waste Management in Abuja*. Internal Departmental Evaluation Paper. Waste Management Department, Abuja Environmental Protection Board. Ministry of the Federal Capital, Abuja Nigeria.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting Social Behaviour*. Englewood Cliffs, NJ: Prentice Hall, Upper Saddle River.

Anakwe, A.I. (2009). Motivation in classroom teaching and learning. A challenge to teacher education programmes. *Nigerian Journal of Teacher Education and Teaching, 7* (1), 44-49.

Akinbote, O. (2007). Some Nigerian primary school pupils' knowledge, attitude and practices on water pollution. *The Social Science, 2*(1), 283-286.

Babayemi, J.O., & Dauda, K.T. (2009). Evaluation of solid waste generation, categories and disposal options in developing countries: A Case Study of Nigeria. *Journal Applied Science Environmental Management, 13*(3), 83-88.

Eguabor, V.O. (2000). Community based environmental education for solid relevance. *Nigerian Journal of Curriculum Studies, 1*(2), 42-46.

Erol, G.H., & Gezer, K. (2006). Primary students' teachers' attitudes towards the environmental issues. *International Journal of Environmental Science Education, 1*(1), 65-77.

Ezeah, C. (2010). *Analysis of barriers and success factors affecting the adoption of sustainable management of municipal solid waste in*

Abuja, Nigeria. Unpublished Ph.D. Thesis, University of Wolverhampton.

Feldman, R.S. (2005). *Understanding psychology*. 7th (ed). McGraw-Hill higher Education.

Kofoworola, O.F. (2007). Recovery and recycling practices in municipal solid waste management in Lagos, Nigeria. *Waste Management, 27*(9), 1139-143.

Pulkkinen, K. (2006). Teacher thinking and practice in environmental education*: Finnish North Caselian Primary School Teachers as Environmental Educations. Sustainable Development through Education*. Proceeding of the international conference on environmental education. Helsinsci, (pp.143-154). U.S.A: McGraw-Hill publishing company.

Sama, E. (2003). Teacher candidates' attitudes towards environmental issues. *Gazi University Journal of Education, 23*(2), 99-110.

World Bank. (2000). Infrastructure-Urban Development. *In the Proceedings of African Regional Conference of Upgrading Urban Slums* held from October, 3rd-5th, 2000, Johannesburg, South African.