



Assessment of Teachers and Pupils Knowledge and Attitude towards Waste Management in Public Primary Schools in Plateau State.

Semshak, D. Zumji; Mulak, N.K. Wul'an*; Kitgakka, Godiya

Primary Education Department Federal College of Education, Pankshin.

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***Corresponding Author**

Mulak N.K. Wul'an

E-mail: Zumjidanladi@gmail.com, Nkmulak97@gmail.com

Phone: 08065791797, 08139252100

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ABSTRACT

This paper focuses on assessment of teachers and pupils' knowledge and attitude towards solid waste management in public primary schools in Plateau State. The design adopted for this research work is the survey research design. The sample population of this study was 500 teachers and Pupils cut across 117 selected primary schools, selected by the researcher out of the population, under study, the hypotheses were tested using t-test statistical tool, and probability of retaining or rejecting the hypotheses is $P \leq 0.05$.; Campaigns on public awareness and information sharing campaigns should be organized to raise the awareness of local people on segregation of waste at the source and encourage them to practice in 3Rs (reuse, reduce, and recycle). It is essential to organize public participation programs in order to obtain better result, in addition to promoting 3Rs, the government may convince the local people to pay a fee for waste management services willingly and encourage them to reduce waste generation from households. Imposing waste management fee may lead to a reduction in waste generation at the household level. The research conclude that improper waste disposal is a threat to the environment, it is important to volunteer in school cleaning activities, teachers and pupils' should minimize solid waste in our environment by reminding other people and on proper waste disposal. There is need for teachers and pupils have positive attitude towards waste management in schools, Teachers and pupils have adequate knowledge of waste management, thereby affecting their attitude.

INTRODUCTION

The waste management sector is facing numerous challenges globally. Huge amounts of municipal and industrial wastes are produced daily worldwide as a consequence of human activities. It is estimated that about 3.4-4 billion tons of solid wastes and up to 300 million tons of hazardous waste are produced annually worldwide (Nabegu, 2010). As the volume and complexity of solid waste increase, the environmental risk posed by the waste products including human health risks, ecosystem degradation, contamination of soils and water, as well as, greenhouse gas emissions, global warming, and climate change become more serious.

Globally, most public schools are facing a high level of pollution as a result of poor knowledge of solid waste management. The situation in less-developing countries such as Nigeria is more acute, partly because of the lack of adequate solid waste disposal facilities and people's negative attitude towards the environment. There is strong evidence which suggests that individual or group awareness and attitudes towards waste generation and management is critical in the effort to respond to the waste management challenges (Kofoworola, 2007). The negative attitude of the society towards the environment also affected the educational institution whose problem has been aggravated by constant changes, not just in curriculum content but also school subjects.

Solid waste refers to any garbage, refuse, sludge, and other discarded materials including solid, semi-solid, or contained gaseous materials, resulting from industrial, commercial, running and agricultural operations, and from community activities (New York State Department of Environmental Conservation, 2015). Solid wastes constitute the following materials when discarded: Paper bags, polythene bags, bottles, agricultural solid waste (tomato peels, cabbage, sugar cane, yam peels, etc.), waste tyres, scrap metal, latex paint, furniture and toys, garbage, appliances and vehicles, oil and anti-freeze, empty aerosol cans, and compressed gas cylinders, construction and demolition debris, and asbestos. Therefore, solid waste could be defined as non-liquid and non-gaseous garbage, refuse or sludge products of human activities, regarded as useless (Leton and Omotosho, 2004).

Solid waste management is the collection, treatment and disposal of solid materials that are discarded because they have served their purpose or are no longer useful. Improper disposal of solid waste can create unsanitary conditions, and these conditions, in turn, can lead to pollution of the environment and the outbreak of vector-borne diseases, that is, diseases spread by rodents and insects. The task of solid waste management presents complex technical challenges. It also poses a wide array of administrative, economic, and social problems that must be managed and solved (Jerry, 2015).

Teachers and students knowledge and attitude towards waste management appears to be crucial as they ultimately play a direct role in providing knowledge-based solutions to in-coming environmental problems. School environmental programs, although addressed to students if properly channel can also influence the environmental knowledge, attitude and behaviour of adults (parents, teachers and local community members) through the process of intergenerational influence. Adaye (2019) asserts that teachers and students' knowledge of waste management play a central role in recycling solid waste which help in generating wealth "waste to wealth" this will enhance independency among young employed and unemployed youths. Every school generates waste arising from routine activities such as classwork, sweeping, serving of food, and bush cutting. All the mentioned can generate wealth when properly managed and recycle. The common types of solid wastes found in various schools include paper, grass, nylon (pure water bags and biscuits, lollypops, ice cream, and sweet or candy wrappers), sugar cane, maize cobs, and groundnut shells. Other forms of wastes may also be found on school premises, and these may not have even been generated directly by pupils and teachers. Age, gender, educational status, and amount charged for waste collection services had been identified as factors influencing solid waste management in highly populated cities like Ibadan and Lagos (Ajani, 2007).

1.2 Statement of the Problem

Waste collection anywhere in the world is a problem that emanate as a result of industrialization and population growth. As cities grow economically, greater business activity and diverse consumption patterns drive up the solid waste quantities. A lot of attention has been given to this challenge in Nigeria, but it seems to be a mere lip service. For an effective strategy to be put in place, everyone roaming the street must be an active participant in the management of the waste produce by the populace.

Waste that are not properly managed are a serious health hazards leading to the spread of infectious diseases. Unattended waste lying around attracts flies, rats, and creatures that in turn spread diseases. WHO (2004) estimates that about 1.8 million people die annually from diarrheal diseases where 90% are children under five, mostly in developing countries. Indiscriminate dumping of waste, irregular collection of waste generated and inadequate resources are all as a result of negative attitude toward waste management. Therefore, this work sort to test primary school teachers and pupils' attitude toward waste management as the bases for adequate training of the upcoming generation through functional education in waste management strategies.

Research questions

The study was guided by the following questions

1. To what extent are teachers and pupils knowledge on solid waste management practices in public Primary Schools in Plateau State?
2. What are the teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State?

Hypotheses

The following hypotheses were formulated and were tested at 0.05 level of significant

1. There is no significant relationship between teachers and pupils' knowledge on solid waste management practices in public Primary Schools in Plateau State
2. There is no significant relationship between the teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State

Conceptual Framework

Wastes and solid wastes

The concept of waste is one that has attracted so much concern from various researchers. This is because many items can be regarded as waste yet what is waste to one individual may not be waste to another. Wastes may be useful materials but are in places where they are not needed. A discarded empty beer bottle or empty bottled water container may be useful to a 'zobo' seller. Though these empty containers are discarded because their owners found them useless, they can become a resource to another person. In the light of this, waste has been conceptualized by different authors. Adewumi (2001) defined waste as a resource in the wrong place. In a different perspective, Tchobanoglous and Kreith (2002) opined that wastes are discarded tangible products of human activities that are regarded as unwanted and useless. Similarly, Abiodun (2003) refers to waste as lack of use or value or useless remains. According to him, it is a by-product of human activities. Oyeniyi (2011) defined waste as any material which has been used and is no longer wanted because the valuable or useful part of it has been taken out. This means that wastes are such items which people are required to discard because their owners no longer see any value in them but can serve another person a useful purpose.

Solid waste has been variously defined by different individuals and groups. (American Public works Association, 1975; WHO, 1977, West African Health Examination Board-WAHEB, 1991; Obionu, 1999; and Okereke, 2000). Additionally, Nnamani (2000) conceptualized solid wastes as all materials that

the possessor or owners no longer considers of sufficient value to retain. Avinash, Manoj, and Eonkar (2008) defined solid waste (SW) as the material that no longer has any value to the person who is responsible for it and is not intended to be discharged through a pipe. The researchers posited that solid wastes does not normally include human excreta but it is generated by domestic, commercial, industrial, healthcare, agricultural and mineral extraction activities and accumulates in streets and public places. Babayemi and Dauda (2009) added that solid wastes are non-liquid and nongaseous products of human activities, regarded as being useless.

Management and solid waste management

Aluko (2001) opined that management is the act of arranging and organizing materials and conditions that the goals and purposes of an organization may be achieved. In similar opinion Maxwell (2004), posited that management is the process of organizing, controlling, coordinating and utilizing human and material resources towards achieving organizational goals.

Based on the study targeting students of a selected hostel in Rajasthan University by Arora and Agarwal (2011) on the variables comprising of waste management knowledge, attitude and practices, established that the university student attitude towards waste management, indicated low, less favorable, and moderate in knowledge, attitude, and practice respectively; correlation of knowledge and attitude was absent, practice and knowledge indicated a substantial correlation.

Waste Management Practices

Adogu (2015) conducted a study in Owerri municipal Imo state residents in Nigeria and found 90% of the respondents on the questionnaire were aware of the waste management with 97.55% showing a positive attitude toward managing wastes and protection of the environmental health. Further, the results showed a 97.1 % of the household wastes comprising of food residues as well as 95.4% being vegetable wastes. Open dumping 66.3% of the sampled population, and burning 62.4% of the population practiced it forms the two poor waste management approaches illustrated in the study. Wheel barrow transportation stood out as the most famous means of waste transportation to the dumping site. The respondents' education and gender significant impact on attitude, practice, and knowledge, attitude and practice of waste management ($p < 0.05$).

METHOD AND PROCEDURES

The design adopted for this research work is the survey research design. The sample population of this study was 500 teachers and Pupils cut across 117

selected primary schools, selected by the researcher out of the population, under study. The teachers and pupils were the respondents in the study. The study employed a simple sampling technique (lottery method) in determining the sample from the population. The process of selection was also through the simple sampling technique. The use of the lottery method was employed to arrive at the total respondents. The essence of this sampling procedure was to represent the entire population. It involved picking without replacement. A self-made 4-point likert-type structured questionnaire titled "**Teachers and Pupils knowledge and Attitudes toward Solid Waste Management**" (TPKASWM). The structured questionnaire is a close-ended type that will enable the subjects to select one from the response options provided. The option provided in this case will be

Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD), rated 4, 3, 2 and 1 points, respectively. While section "A" of the questionnaire requires the respondent's bio-data, section "B" will make up of 20 items each requiring the choice of an option which represents the opinion of the respondents. The descriptive statistics of mean and standard deviation will be used to answer the research questions while ANCOVA (SPSS) approach will be adopted for testing the hypotheses.

Analysis

Question one: To what extent are teachers and pupils knowledgeable on solid waste management practices in public Primary Schools in Plateau State?

Table 1: Mean score of teachers and pupils knowledgeable on solid waste management practices in public Primary Schools in Plateau State

S/N	Items	Mean	Std.	Decision
1	Teachers believe that improper waste disposal is a threat to the environment	3.0	1.16	Accepted
2	It is important to volunteer in school cleaning activities (teachers and pupils)	3.2	1.18	Accepted
3	It is the teachers and pupils' roles to minimize solid waste in our environment by reminding other pupils on proper waste disposal (pick and dispose waste)	2.6	1.16	Accepted
4	Waste management is teachers and pupils' responsibility and not only environmental scientist	2.0	1.02	Rejected
6	It is important to read and share information on waste management with other teachers and pupils	2.8	1.15	Accepted

Table 1 above revealed that waste management is teachers and pupils' responsibility and not only environmental scientist, this enhance their academic performance but the respondents do not agree with the statement of item 4 with the mean of 2.0 was rejected. This implies that, Waste management is teachers and

pupils' responsibility and not only environmental scientist.

Research Question 2: What are the teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State

Table 2: Mean score of teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State

S/N	Items	\bar{x}	Std.	Decision
6	Teachers and pupils always practice waste management	3.3	1.21	Accepted
7	Teachers and pupils have negative attitude towards waste management in schools	3.1	1.16	Accepted
8	Teachers and pupils have adequate knowledge of waste management, thereby affecting their attitude	3.3	1.21	Accepted
9	Waste materials are disposed according to the methods prescribed by the Government	2.4	1.07	Rejected
10	Teachers and pupils consider waste management as contradicting their social life	2.3	1.06	Rejected

Table 2 above revealed that, the respondents do not agree with the statement of item 9 and 10 with the mean of: 2.4, and 2.3 respectively. This implies that, the Waste materials are disposed according to the methods prescribed by the Government and Teachers and pupils consider waste management as contradicting their social life.

Testing of Research Hypotheses

In this section, three hypotheses were stated to guide the conduct of this study. These

hypotheses were tested using t-test statistical tool, and probability of retaining or rejecting the hypotheses is $P \leq 0.05$

Hypothesis One: There is no significant relationship between teachers and pupils knowledgeable on solid waste management practices in public Primary Schools in Plateau State. This hypothesis was analyzed with SPSS using inferential statistical tools of t-test to ascertain differential influence among the variables

Table 3 t-Test on significant relationship between teachers and pupils' knowledge on solid waste management practices in public Primary Schools in Plateau State

Variables	No	DF	Mean	STD	T-cal	(P)
Male	210	68	37.3200	21.7804	1.228	0.228
Female	290		49.3200	22.4622		

Table 3 shows that the calculated p value of 0.228 is greater than 0.05 alpha level of significance at t-test value 1.221 and df of sixty-eight. This shows there is significant relationship between teachers and pupils' knowledge on solid waste management practices in public Primary Schools in Plateau State. Hence, the alternative Hypothesis which states that significant relationship between teachers and pupils knowledge on

solid waste management practices in public Primary Schools in Plateau State was accepted

Hypothesis Two: There is no significant relationship between the teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State.

Table 4 t-Test on significant relationship between the teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State.

Variables	No	Df	Mean	STD	Tcal	(P)
Male	280		51.3000	32.4394		
		130			1.108 ^{ns}	0.271
Female	220		47.5600	23.9285		

Table 4 above showed significant relationship between the teachers and pupils' attitudes on solid waste management practices in public primary schools in Plateau State, because the calculated p value of 0.271 is greater than the 0.05 alpha level of significance at a t-calculated value 1.108 and df of one hundred and thirty (130).

CONCLUSION

Based on the analysis made, it can be deduced that pupils and teachers have good knowledge and positive attitude toward waste management, but the general public has a negative attitude toward waste management.

RECOMMENDATIONS

Campaigns on Public Awareness, Information sharing campaigns should be organized by providing adequate skips and public waste bins in collaboration with the development authority and national solid waste management centre to raise the awareness of local people on segregation of waste at the source and encourage them to practice in 3Rs (reuse, reduce, and recycle). It is essential to organize public participation programs in order to obtain better results.

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