IMPACT OF LOW COST OF ENVIRONMENTAL MATERIALS ON THE KNOWLEDGE AND ATTITUDES OF STUDENTS TOWARDS PROPER SOLID WASTE DISPOSAL.

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BENIN CITY

MAY 2024

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF HEALTH, SAFETY AND ENVIRONMENTAL EDUCATION, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE EDUCATION DEGREE B.Sc.(Ed.) IN ENVIRONMENTAL EDUCATION, UNIVERSITY OF BENIN, BENIN CITY

MAY, 2024

CERTIFICATION

We, the undersigned, acknowledge that this research work was carried out by **IBANGA Sunday Wisdom** with matriculation number **EDU1904514** in the Department of Health, Safety and Environmental Education, Faculty of Education, University of Benin.

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DEDICATION:

I wholeheartedly dedicate this project to my beloved parents who have been my source of inspiration and given me strength when I thought of giving up, who continually provide their moral, spiritual, emotional and financial support.

To my brothers, sisters, relatives, mentor, friends and classmates who share their words of advice and encouragement to finish this project.

And lastly to God almighty, thank you for the guidance, strength, power of mind, protection and skills and for giving me a healthy life. All of these i offer to you.

ACKNOWLEDGMENT

Thank you to my Supervisor, Dr. Norris Erhabor for your patience, guidance and support. I have benefited greatly from your wealth of knowledge and meticulous editing. Highest regard to my classmates and colleagues, whose dedication and collaborative efforts brought my project to fruition. Our institution's support was crucial in ensuring a smooth execution.

Lastly, the family of IBANGA, friends, and loved ones provided unwavering support and motivation. I'm immensely grateful.

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ABSTRACT

This study was carried out to examine the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. Two research questions and two hypotheses were raised and analyzed for the purpose of the study.

A purposive sampling technique was used in selection of fifty (50) undergraduate students which were drawn from 100 level students of the Departments of Health, Safety and Environmental Education (HSE) and in the Faculty of Education, University of Benin for the purpose of the study. The data were collected with questionnaire instrument and analyzed using mean and standard deviation.

It was revealed that students from the experimental group who were exposed to low cost of environmental materials have good attitude towards proper solid waste disposal compared to students in the control group who were not exposed to these materials. The difference in their attitudes was significant, based on the data from the findings of this study. It was also revealed through further findings of this study that students from the experimental group who through the use of low cost environmental materials had knowledge about proper solid waste disposal among undergraduates compared to students in the control group who were not exposed to the materials. Only few of the students in the control group had a little knowledge about proper solid waste disposal. More findings of this study indicated that use of low cost environmental materials has a significant impact in equipping students with knowledge about proper solid waste disposal and the importance of proper solid waste disposal.

CHAPTER ONE

INTRODUCTION

Background to the Study

Solid waste disposal is a serious environmental problems that directly affects the public's health as well as the environment, including the air, water, and soil. Proper solid waste disposal is significantly complicated by the rise in waste generation worldwide. Solid waste (SW) is any non-liquid waste produced by individual’s, homes, small businesses, or institutions. Improper disposal of this waste products can have an adverse effect on the environment and public health. The rates at which solid waste is collected vary greatly amongst nations. Less than 50% of waste generated is collected in low-income countries, 50% to 80% is collected in middle-income countries, and more than 90% is collected in high-income countries, according to Hoornweg and Bhada-Tata (2012). Not everywhere, though, is completely collected. There is an abundance of SW generation as a result of developing countries' fast growing urban populations, economies, and power consumption, as well as the institutional authorities in charge of road construction, city planning, SWM, and the environment not fulfilling their basic functional obligations.

Proper solid waste disposal is essential in order to reduce the negative effects of growing urbanization on rural and municipal areas, including school communities. Due to economic growth and increased consumption, solid waste generated has increased and has become a significant environmental challenge in developing nations. According to Eke (2015), the majority of SWM systems in lower-middle-income countries' cities are underperforming, failing to meet targets, and having a negative impact on the sustainability of urban growth and development. However, as waste disposal becomes increasingly recognized as a fundamental human right, the need to enhance solid waste disposal in developing country cities is growing, partly because of the rural-to-urban migration wave. At least 12 of the 17 Sustainable Development Goals (SDGs) are related to this need (Ray, 2015). There is a severe landfill shortage as a result of the increased waste generation, and waste diposal and management costs have increased. Proper solid waste disposal and management and the circular economy are closely associated, and both play important roles in the 2030 Agenda, particularly in relation to SDGs 11 and 12 (responsible consumption and production), 14 (life below water), and 11 (sustainable cities and communities).

According to Morrisey & Browne (2004), Sustainable development requires effective and efficient waste management. Due to a lack of resources,

infrastructure, vehicles, and technical know-how, as well as insufficient and high cost of environmental education and awareness, the majority of low- and middle-income nations are unable to provide efficient solid waste disposal services (Evan, 2017). A a study by Ikhlayel (2018), waste disposal and management is a complicated sustainability issue that calls for an integrative strategy and a clear vision in order to address its inherent connections to numerous economic and environmental motivators.

Education is one of the vital and essential tools that can be utilized to create awareness, provide knowledge and improve the attitude of students towards proper solid waste disposal (Singhirunnusorn, 2012). A common practice like waste separation slightly improves with age, waste segregation has been found to be practiced by older adults than young adults with indications that most older generations are willing to sort out their waste because they may become more aware of environmental consequences and value the planet (Singhirunnusorn, 2012).

Low cost of environmental materials is important in aiding environmental education, as it plays a huge role in bridging the gap in knowledge as well as the attitude of students towards proper waste disposal. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2017),

peoples knowledge and awareness about the environment and its accompanying challenges can be increased through environmental education. It cultivates the particular knowledge and abilities required to address environmental issues and encourages attitudes, drives, and commitments to make choices and act responsibly. According to the US Environmental Protection Agency (EPA), environmental education encompasses more than just environmental knowledge. It strengthens critical thinking, assisting in problem solving and enabling sound decision-making abilities. Additionally, it raises public awareness and knowledge of environmental issues and empowers people to share information or viewpoints on environmental issues in an effort to make responsible decisions.

Concepts and environmental behavior patterns are referred to as environmental knowledge. According to Olsen (2016), teachers are the main source of information that students need to acquire in order to use education to sustain human life, practice environmentally responsible behavior, and accomplish sustainable development with the aid of environmental materials. Growing environmental knowledge makes people more conscious of environmental issues and may motivate them to take action to safeguard the environment. But in order to address environmental problems such as proper solid waste disposal, environmental materials and expertise in proper solid waste disposal is crucial,

especially in developing nations. As a result, with the availability of this materials at and affordable cost and reach to impact knowledge, teachers can give students a solid foundation in knowledge and an awareness of newly emerging environmental issues through formal education (Olsen, 2016).

To improve the knowledge and sustain positive attitudes concerning proper solid waste disposal among students as the issues in developing countries, formal education for sustainable development is essential at all levels of education, able to trigger a whole societal transformation. In order to improve teaching about environmental sustainability through proper waste disposal, educators need to possess the necessary knowledge, skills, attitude, and inventiveness and this is possible with the availability of adequate environmental materials made affordable and accessible for students at a low cost. In light of this, this study will assess the impact of low cost of environmental materials on the knowledge and attitude of Students towards the proper solid waste disposal.

Statement of the Problem

Environmental materials on the knowledge and attitude of students towards proper solid waste disposal influences environmental students knowledge and attitude. However, if cost of environmental materials is high, it can be a barrier towards the knowledge as well as the attitude of students towards proper solid

waste disposal. Due to the unavailabilty of environmental materials as a result of the costs most times, the majority of students in developing nations lack the practical knowledge necessary to support proper solid waste disposals in their lecture halls, hostels and at home, where they can also influence the knowledge of their families. Most developing nations now include environmental education in their curricula, although variety of teacher's practical knowledge of the subject is still quite limited due to lack of environmental materials.

Consequently, in the majority of developing nations, this has led to gaps that result in lower standards for proper waste disposal. According to a case study by Panko and Sharma (2016), immersing students in environmental education's practical applications, such as proper solid waste disposal, improves their comprehension of the larger concept of the knowledge and attitudes that need to be learned. When deliberate effort is made to develop the curriculum levels of education and teachers, providing the necessary training in practically imparting knowledge and creating awareness in students, sustainable and effective waste disposal practices can be accomplished within the students

Therefore, it is of the interest of the researcher to carry out this study on the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal.

Research Questions

The following research questions are raised to guide the study:

1. What is the impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal?
2. What is the impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal?

Hypotheses

The following hypotheses were formulated to guide the study;

1. There is no significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal.
2. There is no significant impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal?

Purpose of the Study

This study seeks to assess the the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. Specifically, this study seeks to:

1. Assess the impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal.

2. Assess the impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal.
3. Ascertain the factors influencing the knowledge and attitude of students towards proper solid waste disposal?

Significance of the Study

This study was carried out to assess the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. Therefore this study will be of great importance to students, lecturers and the school management as well as policy makers, planners and all stakeholders in the school community and the environment as well. It will reveal the importance of having environmental materials in impacting knowledge towards proper solid waste disposal and how the availability of these materials plays a huge role in contributing to corpus knowledge of the students when it comes to proper solid waste disposal as well as the sustainability of the environment. Also, this study will be essential in addressing proper solid waste disposal among the students and the factors that influence the knowledge and attitudes of the students towards proper solid waste disposal.

The outcome of this study will enable the school management, policy makers and the State government come up with adequate measures towards

providing environmental materials for students at a low cost in order to improve their knowledge towards solid waste disposal which has a huge benefit to the sustainability of the environment. Also this study will be a basis for further studies.

Scope and Delimitation of the Study

The scope of the study is focused on the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. This study will be carried out using students in the university of Benin. It can still be generalized as it is the right of everyone to be concerned and involved with their environment and health. The study is delimited to students in the university of Benin.

Definition of Terms

Impact: A marked effect or influence.

Environmental Materials: These are environmental education resources which include videos, educational apps and other interactive online tools, books and posters, teacher-generated materials, used to equip students with knowledge.

Knowledge: Facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

Attitudes: An attitude "is a summary evaluation of an object of thought. An refers to how a person discriminates or holds in mind." Attitudes include beliefs

(cognition), emotional responses (affect) and behavioral tendencies (intentions, motivations).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter will be discussed under the following subheadings:

- Solid Waste Disposal in Nigeria
- Types of Solid Waste
- Methods of Solid Waste Disposal in Nigeria
- Knowledge of Solid Waste Disposal
- Attitude Towards Solid Waste Disposal
- Waste Disposal Practices
- Factors Responsible for Improper Waste Disposal
- Impact of Low Cost Environmental Material on the Knowledge and Attitude of Students towards Solid Waste Disposal
- Summary of Review of Literature

Solid Waste Disposal in Nigeria

Solid waste is any waste product such as dead plants or animals, food scraps, leaves, newspapers, bottles, animal dung, and poultry droppings, radioactive materials, old cars, or disposable diapers (both biodegradable and non-biodegradable). Water bodies have been choked and drainage networks and sewers have been clogged by the careless disposal of solid waste. The majority of waste is

produced in the immediate vicinity by homes, as well as occasionally by nearby businesses, traders, and artisans. In Nigeria, improper waste collection and disposal is causing a catastrophe for the environment because the nation does not currently have sufficient funding to implement integrated waste management programs throughout all of the States (Wale, 2016). Nigeria now faces a significant problem with solid waste. Significant environmental and health issues are being brought on by the abundance of waste that is frequently found in piles by roads, rivers, and other open spaces in cities. The rate of increase in the urban population is concerning. Urban Development Bank of Nigeria (2018) reports that although the country's population is growing at a rate of 2.8% annually, urban growth is occurring at a rate of up to 5.5% annually. Due to this, maintaining an efficient solid waste disposal system and management system is becoming more challenging. According to Omura (2019), as cities expand, there is a rise in the complexity of land use and a diversification and volume of waste produced.

According to Omura (2019), solid waste disposal encompasses all the tasks and operations necessary to control waste from the point of origin to the point of disposal. This comprises, among other things, waste collection, transportation, treatment, and disposal in addition to oversight and regulation. Garbage, or solid waste, has been a problem for humans as long as they have lived in settled

communities. Modern societies produce far more solid waste than did prehistoric humans (Mondal, 2014). These came about as waste disposal grew more complex due to the evolution of industry, technology, and population growth.The most urgent environmental issue that Nigeria and other developing countries' urban and rural areas must deal with is solid waste disposal. Nigeria is one of the biggest producers of solid waste in Africa, with a population exceeding 170 million. Only 20–30% of the country's yearly production of solid waste is collected. Nigeria generates over 32 million tons of solid waste annually. Paper, plastics and rubbers, textiles, metals, and organic materials make up the majority of these wastes. These wastes are carried and stored throughout the society's living quarters and have a significant risk of negatively impacting the residents' health and cleanliness. It might also have an impact on how the surroundings look.

In most parts of Nigeria, the general composition of refuse is composed of 30% non-organic materials and 70% organic materials (347 land fill recovery). Solid waste disposal in the nation is becoming increasingly concerning every day, despite a plethora of laws and regulations (Wale, 2016). Waste accumulations along highways, rivers, and numerous other urban open areas are a major source of environmental and health issues. The rate of urban population growth is concerning. Nigeria's population is growing at a rate of 2.8% annually, but the

country's urban growth is growing at a rate of up to 5.5% annually (Urban Development Bank of Nigeria, 2008). This is making it more difficult to ensure proper solid waste disposal among residents.

The World Bank estimates that Nigeria will produce 107 million tonnes of solid waste by 2050, up from the current level of at least 32 million tonnes annually. In contrast to middle-class and wealthy neighborhoods where waste is routinely collected, two-thirds of urban households in low-income neighborhoods lack formal waste disposal services, which explains why only 30% of the waste generated is efficiently collected and disposed of. For city dwellers in low-income areas, this reality foreshadows a very bad future. Unable to control the amount of waste they currently produce, these residents will face numerous health and environmental difficulties.

When there is no effective waste management system in place, solid waste is usually disposed of in illegal makeshift landfills, piled up and burned on-site, or left by roadways and street corners. Some waste ends up in nearby streams and water channels, clogging drainage systems and littering the streets. Water can occasionally seep through the landfill and carry pollutants into nearby water bodies or the groundwater aquifer, where they could end up in the food chain or drinking water sources. When batteries and other hazardous chemical waste are

improperly disposed of, dioxins seep into the surrounding soil and contaminate it. Moreover, burning organic waste outdoors releases carcinogens into the atmosphere, which may result in respiratory issues in people.The spread of diseases in low-income neighborhoods is directly correlated with the multi-level failure in solid waste disposal in Nigerian low-income neighborhoods. This is because improper household waste disposal creates a breeding ground for mosquitoes, rodents, and other vector-carrying germs and diseases, endangering public health. According to the 2021 World Malaria Report, Nigeria, the most populous country in Africa, continues to be the country with the highest malaria endemicity worldwide, accounting for 27% of cases and 32% of all malaria-related deaths.

Two important factors have allowed and maintained the poor waste disposal culture in Nigeria's low-income neighborhoods over time.First of all, waste collection in Nigerian cities has been contracted out to businesses. As a result, low-income neighborhoods are usually seen as unprofitable territory by these service providers, who are reluctant to assign the necessary agency and resources to efficiently collect and dispose of waste in these neighborhoods. Yet, because every neighborhood is close to every other, ignoring waste disposal in one place can have disastrous consequences for the entire city. The second issue is that

most residents of low-income neighborhoods have very low levels of environmental literacy and are ignorant of the risks associated with inappropriate waste disposal and other harmful environmental practices they currently engage in. As a result, it is crucial to continuously raise residents' awareness of environmental issues. In order to promote social responsibility, it is imperative that citizens be encouraged to fulfill their responsibilities towards maintaining a clean environment and adopting eco-friendly practices. This can be achieved by offering concise, precise, and practical information about the dangers of improper waste management, which will discourage delinquent behavior and encourage behavioral changes that encourage waste segregation at the source rather than combining all waste to be dumped in landfills. Citizens need to be encouraged to separate their waste into categories such as compostable, recyclable, reusable, and non-biodegradable. The environment will eventually become healthier as a result of this tiny but important change in behavior patterns.

Types of Solid Waste

According to the United Nations Environment Program (2012), solid waste originates from business operations, institutions, homes, and organizations. Among other wastes, the main components of solid waste are plastics, wood, rags, metal, and food. Hazardous wastes from construction wreckages and building

demolitions, such as batteries and lightbulbs, pose a risk to both human and environmental health (United Nations Environment Program, 2012). Bundling materials, waste from food manufacturing and processing, oils, solvents, resins, paints and sludges, glass, pottery, stones, metals, plastics, rubber, cowhide, wood, fabric, straw, abrasives, and so on are examples of industrial waste that was included in this study, according to the United Nations Environment Program (2012).

The sources, types, amounts, and disposal techniques of waste as well as the detrimental effects of inadequate waste management on health were emphasized in a 2013 study by Alam and Ahmade on the influence of waste on the environment and human health. As the research shows, the liquid excreta from homes and communities constitutes a serious health risk due to waste materials that aid in the development and spread of infectious diseases in society. Industrial wastes include wastes produced during the production process, such as traffic and resource development, according to a study by Li (2016). The study examined the coefficient of waste generation as well as the numerous economic industries and the wastes connected with them, such as the mining, power, chemical, oil, light, and metallurgical sectors. Alam and Ahmade (2013) conducted research on the effects of waste on the environment and human health. They identified the

different types and quantities of waste, their components, how they should be disposed of, and the negative health effects of improper waste management. The findings pointed to infections and the dangers that society's wastes pose to both human and environmental health.

Methods of Solid Waste Disposal in Nigeria

The various methods of solid waste management could be classified as follows;

- Sanitary Landfill (garbage dump or dumping ground)
- Incineration also known as thermal treatment.
- Open burning
- Dumping in a sea or water passage.

Sanitary Landfill;

This phrase generally refers to a sizable plot of land far from residential areas where all of a town's waste is dumped. In order to manage a landfill properly, all waste must be separated, and only waste that cannot be recycled or composted should be sent to the location. The earliest method of waste treatment is land filling (though the part about burial is new; in the past, trash was simply piled up or thrown into pits). Landfills have historically been the most popular way to dispose of organized waste, and they still are in many parts of the world (Anon, 2013).

In China, more than 80% of the solid waste produced is landfilled. When done correctly, land filling offers the most affordable and practical way to dispose of waste nowadays (Krook, 2012). Every day, a few million tons of solid waste are dumped worldwide in dump sites, or uncontrolled landfills, and sanitary landfills, or controlled landfills (Environmental Protection Agency, 2005). In order to reduce the amount of toxins and other soil pollutants that leak into the water table, proper landfills have liners at the bottom (Anon, 2015). Waste is frequently seen being disposed of everywhere in areas without designated landfill space. People typically discard their waste wherever they think is appropriate. The majority of the time, such inappropriate waste disposal results in harm to the adjacent body of water (Henry, 2016).

Advantages:

- It is possible to recover and repurpose land-filled areas.
- According to Gour (2013), natural resources are recycled and returned to the soil.
- When waste in landfills breaks down naturally, it releases gases like carbon dioxide and methane, which the large landfill plants use to produce energy.
- By lowering greenhouse gas emissions and air pollutants, landfill gas energy (LFGE) projects improve local air quality and lower health risks.

- The gases evolved by the landfills are trapped in by the machinery of the power
- generation plants, where it provides electricity (Henry, 2016).

Disadvantages;

- A sizable area that is remote from the town is needed for land fill.
- Transport expenses are high, and improper landfill management results in an unpleasant stench as well as a breeding ground for flies and mosquitoes.
- Causes fire hazard due to formation of methane in wet weather (Gour, 2013).
- Leachates is another potentially major source of pollution, which is the highly toxic liquid that can then seep into the top layer of soil and in fact even percolate down to affect the groundwater and other water bodies and hence harm the ecosystem in many ways (Henry, 2016).

Incineration

This procedure, also referred to as thermal treatment, involves using incinerators to transform solid waste materials into heat, gas, steam, and ash. Solid waste that contains a higher percentage of organic material and hazardous materials is a good candidate for incineration (combustible refuse). Japan is among the nations that practice incineration when there is no longer any landfill space available. Compared to landfilling or composting, it is more costly (ANON, 2015).

To prevent it from emitting excessive amounts of outside heat, an incinerator is built of bulky, well-insulated materials (Mondal, 2016). In order to avoid including noncombustible materials like glass, it also needs to be sorted of waste similarly to a landfill (Mondal, 2016).

Advantages;

- Incineration uses very little space and reduces waste volume to only 20–25% of its original volume.
- When the incinerator is situated inside city limits, the transportation cost is negligible and the burden on landfills is lessened.

Disadvantages;

1. It has expensive startup and running costs.

2. Skilled workers are needed for operation, and additional ash disposal is required.

3. Incineration method emits gaseous pollutants, dust and smoke(Gour, 2013).

Composting

This is another widely used approach that is used in numerous cities. Using biological waste treatment, this method turns large amounts of organic waste into fertilizer. Layers of separated compostable waste are deposited in subterranean trenches. Governmental organizations in many nations are concentrating on reducing waste generation and recycling in an effort to lessen the effects of human

activity on the environment. With this emphasis, composting has gained prominence globally for converting organic by-products into new resources and has been ranked highly in the hierarchy of recycling techniques.

At last, the wastes are transformed into humus, which has the ability to fertilize because it contains a lot of nitrogen, phosphates, and other minerals that are essential for healthy plant growth (Anon, 2016). There are three ways to compost: in a deep compost pit, on the surface of the ground, or through anaerobic digestion in a biodigester.

Advantages;

- This produces high-quality, environmentally friendly manure that is rich in nutrients and enhances soil fertility.
- Recycling and replenishing the soil with nutrients is ensured through composting.
- It facilitates easier soil cultivation and improves the soil's capacity to hold on to water and nutrients (Mondal, 2016).

Disadvantages;

There are numerous solutions to the problems that arise during the composting process, including odour and water scarcity. Non-consumables must

be disposed of separately; the market for non-consumables is uncertain because technology has not kept up with farmers (Gour, 2013).

Gasification and Pyrolysis;

These two procedures are similar in that they both expose waste to extreme heat and low oxygen levels in order to break down organic waste materials. While gasification allows for very little oxygen to be used during the process, pyrolysis uses zero oxygen at all. Gasification is preferable because it recovers energy from burning without polluting the air (Rick, 2016). According to earlier research, developed nations frequently employ the disposal techniques covered above (Nwachukwu, 2010).

Other techniques for disposing of solid waste are primarily used in developing countries. These techniques include burning and burying waste, using designated and accidental open spaces, disposing of waste in drainage systems during and after rainy seasons, and using riverbanks and roadside locations. Other uses include using unfinished buildings, empty lots, and collection services provided by private waste managers, government trash vans, and cart pushers. Due to their lack of environmental friendliness, these techniques are regarded as both foolish and hazardous (Rushbrook and Pugh, 2016). These techniques are used in Nigerian cities like Lagos, Ibadan, Kano, Rivers, Jigawa, and others. As a result,

piles of solid waste are frequently discovered in culverts, drainage channels, beneath bridges, and other open areas in addition to along roads. These includes; Open Burning; Thermal waste treatment is not the best option in the current context and is bad for the environment. In Nigeria, burning solid waste is a regular practice (Wale, 2016). This kind of incineration is referred to as uncontrolled.

Dumping into the Sea; The Nigerian federal government established the Federal Environmental Protection Agency (FEPA) on December 30, 1988, by enacting Decree 58. This decision was prompted by the mountains of solid waste that litter Nigerian cities and the ongoing untreated discharge of industrial pollutants into streams and rivers (FMG, 1988). Despite the creation of a national environmental policy and the Federal Environmental Protection Act, the environment has not been sufficiently safeguarded (Edem, 2008). Similarly, 16.2%, 10.5%, and 27.2% of the residents in the high, medium, and low densities, respectively, indicated that they frequently disposed of their solid waste in Lagos State Waste Management's (LAWMA) refuse facility, according to a study carried out in Lagos as a social service and environmental management initiative provided by the Lagos State Government.

Even with the aforementioned conclusions, the study demonstrated that careless waste disposal was common in Lagos. This claim is supported by the data

that shows that, in the high, medium, and low densities, respectively, 21.9%, 21.1%, and 22.7% of the residents disposed of solid waste on the road; up to 16.5% and 18% of the residents disposed of waste in the drain during rainfall. In the high and medium densities, burning constituted 8.4% and 11.5% of disposal practices, respectively.All three of the residential densities practiced the act of disposing of waste in open spaces. However, in the high, medium, and low residential densities, it made up 10.8%, 12.5%, and 11.3% of all disposal methods, respectively. Waste was frequently disposed of on undeveloped land in areas where landowners had not yet begun to develop the land (Oluwole, 2014).

Knowledge of Solid Waste Disposal

Based on a study by Arora and Agarwal (2011) that focused on students in a particular hostel at Rajasthan University and examined a variety of variables including waste disposal knowledge, attitudes, and practices. The primary goal of the study was to determine how university students felt about disposing of waste. A sample of three students was used, and the questionnaire was self-administered as a method of data collection. The results were analyzed using a t test. The results showed that knowledge, attitude, and practice were, respectively, low, less favorable, and moderate; there was no correlation between knowledge and attitude, but there was a significant correlation between practice and knowledge.Kumar et

al. (2013) used a cross-sectional study in their investigation to determine the knowledge and practices regarding biomedical waste among a population sample of healthcare workers in healthcare facilities. Because 31% of health care workers were not vaccinated against hepatitis B, only 35.4% of them possessed the necessary training and skills for disposing of biomedical waste. Karout & Altuwaijri's (2012) study on the effects of community health awareness and intervention on knowledge, attitudes, and behaviors regarding the disposal of waste products.A questionnaire was used in the study as a means of collecting data. The results showed that the group that participated in the training and education programs had a broad understanding of diseases and health risks related to waste accumulation, a positive attitude toward waste disposal, and improved waste handling techniques, including recycling household wastes. The observation revealed a rise in community involvement in environmental protection initiatives like cleaning.

Attitude towards Solid Waste Disposal

Eneji et al. (2016) carried out a waste management and disposal study. The study's hypotheses were tested at the significance level of 0.05. The findings suggest that Calabar South residents have a very negative attitude toward waste management and disposal, and the second hypothesis also demonstrated a

significant relationship between the health status of Calabar South Local Government Area residents and indiscriminate waste disposal. The research findings indicate that the health status of the residents of Calabar South is significantly impacted by their negative attitude towards the management and disposal of their waste. Barloa (2016) conducted research on 2528 Polytechnic university students to determine the impact of attitudes, practices, and knowledge on waste management.According to the results, 73.4% of students said their knowledge of strategic waste management issues was satisfactory, 71.4% said their attitude toward these issues was satisfactory, and 43.1% said their practical knowledge was satisfactory. The relationship showed how knowledge and attitude interact significantly. The results of the study showed that household attitudes toward waste disposal and payment for waste collection intentions had a substantial and positive impact.

Waste Disposal Practices

According to a study by Adogu et al. (2015), 90% of respondents to a questionnaire about waste disposal in Owerri, Imo state, Nigeria, were aware of the practice, and 97.55% of them expressed a favorable attitude toward waste management, disposal, and environmental health protection. Additionally, the results revealed that 95.4% of the household wastes were vegetable wastes and

that 97.1% of the wastes consisted of food residues. The two inadequate methods of waste disposal and management that are demonstrated in the study are open dumping, which was done by 66.3% of the sampled population, and burning, which was done by 62.4% of the population.

Among the methods used to move waste to the disposal site, wheelbarrow transportation was the most well-known. Knowledge, attitude, and practice of waste management are significantly impacted by the respondent's education and gender ($p < 0.05$). Giusti (2009) reviewed waste management techniques and looked into the effects of bioaerosol exposure from sewage plant treatment and the impact of municipal waste on human health. The population living close to nuclear installations and dumping sites was found to have negative health effects from municipal waste.

Furthermore, Adeyemi and Adeyamo (2006) discovered that the primary methods of disposing of wastes have a noteworthy impact on both environmental hygiene and human health. The growing population in urban areas like Nairobi has made waste management more difficult. The heightened difficulties mentioned above are a result of a lack of funding for the department of urban sanitation and city regulations pertaining to sanitation.

Factors Responsible for Improper Waste Disposal

Because they believe they have no other options for managing their solid waste, communities in developing nations frequently resort to waste disposal practices that have been shown to be harmful to both human health and the environment, such as open dumping and burning (or unregulated landfills) (Alavi Moghadam, 2009). In many developing nations, disposing of solid waste has become a major concern due to industrialization, urbanization, and rapid growth. Trash was regularly burned or disposed of in uncontrolled areas, according to a case study carried out in several rural Indian cities (Narayana, 2009). Despite the fact that it is against the law to burn trash, hundreds of thousands of people who do not have garbage pickup have nowhere else to dispose of their waste.

In these communities, waste is disposed of by households in small trash pits, which are burned every two weeks. The leftover waste is moved to bigger pits outside the town once the pits are filled (Narayana, 2009). There is a severe lack of land available for disposing of waste in bigger towns and cities like New Delhi. Solid waste is usually disposed of by placing it in low-lying areas outside of cities, but this disposal method is not sustainable because it does not adhere to the sanitary land filling principles of leachate collection and monitoring. Open burning of household waste has become commonplace in both rural and urban

areas where collection is either minimal or nonexistent (Narayana, 2009). The factors responsible for this improper waste disposal includes;

- Irregular Waste Collection; Trash collection is sporadic and limited to big cities. Improperly placed open dumps damage multiple cities, posing a health risk to the public by promoting the spread of illnesses and odors, allowing contaminated goods to be recycled carelessly, and contaminating water sources. (Adegoke, 2008).
- Methane: Methane is a strong-smelling gas that is produced when waste materials decompose in landfills and dump sites. It can cause a variety of illnesses, including nausea and headaches. Furthermore, methane is a combustible substance. Since methane is lighter than air, it can collect in adjacent homes and buildings. As a result, chronic disorders may also spread among the residents of these areas, leading to a host of other issues (Henry, 2016).
- Badly managed landfills: These could become nuisances due to flies and rats, which are known to carry infectious diseases. It is possible to reduce the presence of these vectors by using daily cover. Nigerian cities and towns lack sanitary landfills.

- Open burning: The most popular method of disposal in Nigeria, open burning has a negative impact on the environment and public health because it releases a number of harmful substances into the atmosphere, affecting not only humans but also other animals and birds, through the production of smoke, ash, slag, and sludge, as well as nitrogen oxides, carbon dioxide, hydrochloric acid, dioxin, and furans. Some extremely persistent organic compounds that are harmful to humans, like furans and dioxins, have drawn special attention. Numerous studies have indicated that the most common ways of disposing of waste in Nigeria are open dumping and burning of waste in cities like Lagos, Abuja, Ibadan, and Kano (Oluwole, 2014).
- Lack of awareness: The public is generally unaware of the problems with waste and is only concerned with one poorly designed land disposal site. Unfavorable economic conditions as well as institutional, statutory, technological, and operational limitations plague the current system (Imam, 2007).
- Dumping in water: The practice of disposing of waste in Nigerian water bodies has a detrimental effect on the water's chemical composition. We refer to this as water pollution in technical terms. Every aquatic ecosystem will be

impacted by this. Animals that drink from such contaminated water may also suffer consequences from it.

- Contamination of the soil: When dangerous chemicals (contaminants) seep into the soil, plants may become harmed when their roots absorb the toxins. Human health may suffer if they consume plants or animals that have come into contact with such contaminated soils. Many towns do not sort their waste; instead, everything is mixed together and dumped, including paper, food, diapers, and glass. This is problematic since it takes thousands of years for plastics and glass to break down (Anon, 2015).

Impact of Low Cost Environmental Material on the Knowledge and Attitude of Students towards Solid Waste Disposal

The majority of developing nations in the world are now very concerned about the disposal of solid waste. The amount of waste produced in urban areas has increased due to Nigeria's fast population growth and ongoing migration of people from rural to urban areas in search of greener pastures. When it comes to tertiary institutions, the majority of the areas in which they are located were previously semi-rural settlements; however, after the institutions are established, the areas become semi-urban settlements. Due to the increased population, there was a rise in the quantity of waste produced by the students who left the

community. The proper management of waste poses a threat to both human health and the environment, and most countries are still grappling with this issue on a global scale (Omar, Hossain & Parvin, 2018).According to Tesfaye (2007), if these wastes are not properly disposed of, they provide food and harborage for rats as well as breeding grounds for insects like flies and mosquitoes. Because they may spread disease, these insects and rats pose a risk to human health. The unfavorable attitude of students toward the environment causes waste disposal issues in non-residential areas of tertiary institutions.

Due to this, environmental education can play a huge role in equipping students with appropriate knowledge as well as shaping their attitudes towards proper solid waste disposal. This can be achieved by taking urgent actions in sensitizing students towards a positive environmental life style which will help to sustain the environment by acquiring appropriate environmental knowledge through the provision and availability of low cost of environmental materials, helping students acquire skills and capacities that are needed for environmental sustainability.

Students' careless dumping of trash and incorrect handling of these wastes could have a negative impact on public health. Some students in private hostels are unable to maintain a clean environment because they do not believe that living in a

clean environment is a necessary part of being human. Their negative attitude makes them unwilling to work with others to clean up residential areas, and they play a passive role in sanitation activities (Kaithery & Karunakaran, 2019). They carelessly discard papers, plastic bags, used clothing, shoes, boxes, sanitary pads, food waste, and other items in public areas such as the roadside, any open space, the back of their hostels, bush paths, and open drains. Students at non-residential tertiary institutions also frequently engage in open dumping, raising concerns about public awareness of the health and environmental risks that their actions may pose to other members of society.

Low cost of environmental education materials can provide adequate knowledge essential and adequate to provide knowledge as well as shape the behaviour of the students. Adoption of certain theories such as The theory of planned behaviour theory. According to Ajzen (1988), the theory of planned behaviour assumes that the best prediction of behaviour is given by asking people if they are intending to behave in a certain way. It is assumed that intention will not express itself in behaviour if it is physically impossible to perform the behaviour or if unexpected barriers stand in the way. The theory of planned behaviour is one of the models most frequently used in the literature to explore pro-environmental behaviour this includes recycling, travel mode choice, energy

consumption, water conservation, food choice, and ethical investment (Staats, 2003). The connection between using low cost of environment education materials to impact students knowledge and attitudes towards proper solid waste disposal is that the theory can access the students knowledge towards waste disposal. Other concepts through the availabilty of low cost of environmental materials in this regard can be utilised in order to help students adjust and adopt healthy habits that keeps the environment safe and sustained.

Summary of Review of Literature

Solid wastes are harmful to the environment and public health, so it's important to dispose of waste properly, especially when it comes to students.Sanitation conditions deteriorated as a result of the population growth and rapid urbanization, as garbage waste posed a serious threat to both the environmental hygiene and public health of the local residents. From ancient times to the present, disposing of solid waste has been difficult and will continue to be so in the future. As cities grew, the importance of properly disposing of waste for public health increased. Municipal governments were forced to organize measures to reduce solid waste's nuisance and health hazards due to factors such as poor housing, overcrowding, and poor sanitation. Solid waste disposal remains a challenge due to the increased generation of waste products from the affluent

lifestyles of people living in industrialized nations. The burden of disposing of solid waste is increased in developing nations due to slums, fast population growth, and a massive population shift from rural to urban areas. Reusing, recycling, and returning waste products has become commonplace in many nations since the 1980s, and these actions are starting to lessen the need for landfill space. Recycling materials such as paper, plastic, glass bottles, and metals has become a lucrative endeavor and helps to reduce the amount of solid waste that needs to be disposed of. Animal wastes can now be used to generate methane gas for home and commercial energy production thanks to advancements in biogas technology.

However, student waste disposal can be enhanced with inexpensive environmental education resources. There is a lack of public confidence in governments and scientific communities, as well as confusion regarding the distinctions between hazardous household, industrial, and hospital wastes. As a result, government organizations and local authorities must constantly communicate with and educate the community.

CHAPTER THREE

METHOD OF THE STUDY

This chapter presents the method and procedures that will be used in conducting the study. It is organized under the following sub-headings:

- Research Design
- Population of the Study
- Sample and Sampling Technique
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Administration
- Method of Data Analysis

Research Design

The research design adopted for this study was the quasi experimental research design. The research design is the most suitable in order to assess how the knowledge and attitudes of students towards proper solid waste disposal are being impacted through low cost of environmental materials. The quasi-experimental design is used to reveal the cause-and-effect relationship that exist among variables, that is the independent (manipulated) and dependent (resultant) variable.

It helps researchers understand the influence of specific variables on outcome and provides direction and insights into the efficacy of the policies or interventions.

In this, research, the quasi-experimental design is suitable as it compare students who have no knowledge about proper solid waste disposal and other group who have vast knowledge about it. It therefore make it possible to find out if the low cost of environmental materials has any impact in their knowledge and attitudes concerning towards proper solid waste disposal among undergraduates in the university of Benin.

Fig 4: Quasi Research Design.

$R_1 \quad O_1 \quad X \quad O_2$

$R_2 \quad O_1 \qquad O_2$

Where:

R_1= Experimental group

R_2= Control group

O_1 = Pretest

X = Treatment (Environmental Education Workshop)

O_2 = post test

Population of the Study

The population of this study consisted of all the students in the University of Benin, while the target population was all 100 the level students in the department of Health, Safety, and Environmental education (H.S.E.). This consisted of a total of 153 students enrolled in two different course areas: Environmental Education and Health Education (Department of Health, Safety, and Environmental Education 2022/2023 session). Out of 100 students in both course areas, fifty (50) undergraduate students were randomly selected.

Sampling and Sampling Technique

A purposive sampling technique was selected for this study. Purposive sampling is a non-probability sampling technique in which researchers purposely select individuals that possesses the specific characteristics or qualities of interest to the study. This method is used to gather in-depth information and explore specific dimensions of a phenomenon. The respondents were categorized into two, the experimental group and the control group. Those who responded in the experimental group category received a treatment (a demonstration) while those under the control group did not receive any treatment. A total of fifty (50) respondents were chosen from both course areas. The sampling method is best explained in the table below;

Table 1.0: Sampling Method

S/N	Selected groups	Number of Respondents
1.	Experimental Group	25
2.	Control Group	25
TOTAL		50

Research Instrument

A self structured questionnaire was used for the study. The questionnaire was divided into three sections. Section A covered the demographic data of the respondents while section B tested the respondents knowledge on the proper solid waste disposal. And section C provides information that asks the respondents to indicate their level of agreement with a series of questions using A four point scoring scale drawn along the modified Likert summated rating scale for measurement (SA = Strongly agree, A = Agree, D, D=Disagree, and SD= Strongly disagree) to show their attitude towards the sources of emotional stress.

Validity of the Instrument

The face and content validity of the instrument was established by giving draft copies of the instrument to the project supervisor and two other experts in the Department of Health, Safety and Environmental Education. Their corrections and suggestions was used to prepare the final copy of the instrument.

Reliability of the Instrument

The reliability of the instrument was be established using test-retest method of estimating reliability. Consequently, the constructed instrument was administered on a group of twenty (20) students within an interval of two weeks. The correlation of the response was determined using the Pearson's Product Moment Correlation.

Method of Data Administration

The instrument was administered directly to the respondents by the researcher. The respondents were urged to reply freely and impartially as it relates to them in order to obtain first hand information from them without bias. The respondents filled out the questionnaire, which the researcher retrieved personally upon the completion of their responses.

Method of Data Analysis

Data collected through the administration of questionnaires was analyzed using descriptive statistics for easy interpretation. Descriptive statistics are brief informational coefficients that summarize a given data set, which can be either a representation of the entire population or a sample of the population. It involves summarizing, organizing, and presenting data meaningfully and concisely. This enabled the researcher to meaningfully describe independent factors in the study,

as well as helping to indicate the number and percentage of respondent rank, and rank variables under this study.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDING

This chapter involves the presentation of results and discussion of findings. The result obtained from the data collected are analyzed and discussed. A total of 50 (fifty) questionnaires were administered and fifty questionnaires were retrieved representing a 100% return rate. The result of the data are presented in tabular format as well as the analysis drawn from them.

KEYNOTES:

Knowledge tables: respondents who scored between; 0-4 are interpreted as low knowledge, 5-6 as moderate while 7-10 are interpreted as having high knowledge.

Attitude tables: respondents who scored between; 0-20 are interpreted as having negative attitude while those who scored between 21-40 are interpreted as having positive attitude.

Research Question One;

What is the impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal?

Table one: Impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal

GROUP		Pre-knowledge	Post-knowledge
EXPERIMENTAL	Mean	7.20	9.60
	N	25	25
	Std. Deviation	1.41	.50
CONTROL	Mean	6.92	6.60
	N	25	25
	Std. Deviation	1.11	1.32
Total	Mean	7.06	8.10
	N	50	50

From table one above, as represented it is shown that the knowledge level of the experimental group is high with a mean of 9.60, and a standard deviation of .50 which shows the impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal.

Also, the table shows the knowledge level of the control group. From the table above, the knowledge level of the control group is moderate with a mean of 6.60 and a standard deviation of 1.32 from the respondents on the control group, towards proper solid waste disposal. This shows that the knowledge level of the control group is average.

Table one above shows the knowledge level of both the experimental and control groups. The experimental group have a high knowledge towards proper

solid waste disposal with a mean if 9.60 and a standard deviation of .50. In contrast, the control group has a reduced knowledge on proper solid waste disposal with a mean of 6.60 and a standard deviation of 1.32. Hence, the respondents in the experimental group, have better knowledge towards proper solid waste disposal than those on the control group.

Research Question Two;

What is the impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal?

Table two: Impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal

GROUP		Pre-attitude	Post-attitude
EXPERIMENTAL	Mean	30.36	34.60
	N	25	25
	Std. Deviation	2.91	2.84
CONTROL	Mean	29.04	29.24
	N	25	25
	Std. Deviation	2.95	3.03
Total	Mean	29.70	31.92
	N	50	50
	Std. Deviation	2.97	3.97

Data from table 2, shows that the experimental group after being exposed through the use of low cost effective materials in environmental education, have a positive attitude with a mean of 34.60 and a standard deviation of 2.84.

The table also shows the data on the control group who have not been exposed to environmental education through the use of low cost effective

materials. The table shows that majority of the respondents on the control group have a positive attitude with a mean of 29.24 and a standard deviation of 3.03. Therefore, comparing the experimental group and the control group, it is seen that the experimental group who have been exposed through the use of low cost effective materials in environmental education have a greater positive attitude with a mean of 34.60 and a standard deviation of 2.84 on proper solid waste disposal than the control group, which have not been exposed to environmental education through the use of low cost effective materials having a positive attitude with a mean of 29.25 and a standard deviation of 3.03. Hence the respondents who were exposed on the concept of proper solid waste disposal using low cost effective materials have a greater positive attitudes towards the proper solid waste disposal than those in the control group without any exposure.

Hypotheses Testing.

Hypotheses One; There is no significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal

Table three: ANCOVA on significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal

Tests of Between-Subjects Effects

Dependent Variable: POSTK

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	112.796[a]	2	56.398	55.566	.000
Intercept	110.326	1	110.326	108.698	.000
PREK	.296	1	.296	.292	.592
GROUP	112.384	1	112.384	110.725	.000
Error	47.704	47	1.015		
Total	3441.000	50			
Corrected Total	160.500	49			

a. R Squared = .703 (Adjusted R Squared = .690)

The table 3 showed the ANCOVA on significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal. It can be seen that the F-value is 110.72 and level of significance is 0.00. Hence the null hypothesis which stated that there is no significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal is rejected. This revealed that there is significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal. This showed that low cost materials significantly impact on students' knowledge of proper solid waste disposal.

Hypotheses Two; What is the impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal?

Table four: ANCOVA on impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	382.087[a]	2	191.044	22.930	.000
Intercept	287.725	1	287.725	34.534	.000
PREA	22.967	1	22.967	2.757	.104
GROUP	302.636	1	302.636	36.323	.000
Error	391.593	47	8.332		
Total	51718.000	50			
Corrected Total	773.680	49			

a. R Squared = .494 (Adjusted R Squared = .472)

The table 4 showed that ANCOVA on impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal. It can be seen that the F-value is 36.32, the level of significance is 0.00 which is less than the set alpha level of 0.05. Hence the null hypothesis which state that there is no significant impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal is rejected. This revealed that low cost environmental materials significantly impact on the attitude of students towards proper solid waste disposal.

Discussion of Findings

This study was carried out to to assess the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. This study's aim was based on the impact of low cost of environmental materials in providing knowledge and improving the knowledge of students towards proper solid waste disposal. It was revealed that majority of the experimental group with a mean of 9.60 had high knowledge through their responses to the items compared to the control group with a mean of 6.60 with a standard deviation of .50 and 1.32 respectively. These results corroborates a study done by Karout (2012) that showed that community health awareness and intervention on knowledge regarding proper solid waste disposal improved the knowledge of the residence after being exposed to importance of proper solid waste disposal.

The findings of this study, further revealed the attitude towards proper solid waste disposal. The table representing the students attitudes, showed that the experimental group who were exposed on proper solid waste disposal through low cost of effective materials, had a greater positive attitude with a mean of 34.60 than the control group who were not exposed with a positive attitude of 29.24 and a standard deviation of 2.84 and 3.03 respectively. These scores therefore reveals

that the students have a positive attitude towards proper solid waste disposal which is in line with a study that was done by Omura (2019), that people can develop proper practices towards solid waste disposal if measures and tasks and operations necessary to control waste from the point of origin to the point of disposal are provided.

Furthermore, on testing the hypothesis, it was observed that both hypothesis which stated that "There is no significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal" and "There is no significant impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal" were both proven wrong and rejected. This shows that there is a significant impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal" and "there is a significant impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal". Also, the positive attitude and high level of knowledge among the students signifies that use of low cost effective environmental material is efficient in providing knowledge and promoting the attitudes of the students towards proper solid waste disposal.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The purpose of this study was to assess the impact of low cost of environmental materials on the knowledge and attitudes of students towards proper solid waste disposal. The following research questions where generated and answered:

- What is the impact of low cost of environmental materials on the knowledge of students towards proper solid waste disposal?
- What is the impact of low cost of environmental materials on the attitude of students towards proper solid waste disposal?

The purpose and significance of the study was expressed as well as the key terms guiding the study defined clearly. It was concluded that there is a need to assess the impact of the low cost of environmental materials on the knowledge of students towards proper solid waste disposal as well as the positive attitude of students towards proper solid waste disposal.

Important Literatures were reviewed on the impact of low cost of environmental materials on the knowledge and attitudes of students towards proper solid waste disposal. Under the impact of low cost of environmental

materials on the knowledge and attitudes of students towards proper solid waste disposal, the sub-sections included; solid waste disposal in Nigeria, types of solid waste disposal, methods of solid waste diposal, knowledge of solid waste disposal, attitude towards solid waste disposal, waste disposal practices, factors responsible for improper waste disposal and the impact of of low cost environmental material on the knowledge and attitude of students towards solid waste disposal.

The Research methodology discussed the research design, population of the study, sample and sampling technique, research Instrumentation, validation of the instrument, reliability of the instrument, administration of the instrument, method of data collection, and method of data analysis. Necessary data were tabulated. From the analysis of the data, the researcher was able to find out the the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. It was observed in table one that respondents in the experimental group with a mean of 9.60 had high knowledge compared to the control group which was 6.60 for the impact of low cost of environmental materials on the knowledge and attitudes of students towards the proper solid waste disposal.. It also indicated in table three and four that there is a significant impact of low cost of environmental materials on the knowledge and

attitudes of Students towards the proper solid waste disposal. Based on the data analyzed, it was discovered that the low cost of environmental materials helps in providing knowledge and shaping the attitudes of students adequately towards proper solid waste disposal.

Conclusion

This research work revealed the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. It was discovered that low cost of environmental materials increases the students' awareness about proper solid waste disposal as materials are easily affordable to aid the teaching and learning process about the importance of proper solid waste disposal. And this improves the attitude of students positively towards the practice of disposing waste properly.

The result obtained from the analysis of data revealed that the knowledge gained through the low cost of environmental materials impacted the students positively and made them not only learners but action takers by understanding the importance of disposing waste properly and how it contributes greatly to the sustenance of the environment.

Furthermore, the rejection of the null hypotheses, which stated that there is no significant impact of low cost of environmental materials on the knowledge and

attitude of students towards proper solid waste disposal, further reveals the importance of low cost of environmental materials in positively influencing both knowledge acquisition and attitude formation among students as well as their practices regarding solid waste disposal. In conclusion, it is affirmed that low cost of environmental materials plays a crucial role in enabling students' knowledge and promoting positive attitudes towards solid waste disposal among undergraduates at the University of Benin.

Recommendations

Based on the research findings, the researcher made the following recommendations;

- Environmental education materials for teaching and learning should be provided at a low cost for students in order to enable the students to acquire these materials and understand the various concepts relating to the sustainability of the environment
- Policy makers and school administrators should devise means to enable the availability of environmental education materials at a cost to aid instructors have a wide coverage of materials to complement the teaching and learning of various topics in environmental education which will improve the learning and understanding of environmental education students in all facets.

- School instructors, teachers and lecturers in learning institutions should endeavour to adopt strategies that will enable students to access environmental educational materials at a low and affordable cost in order to boost their understanding and assimilation of the course work and contents.
- School administrators and the heads of department should work in synergy to endeavour that various guideline and strategies which are stress free are made to ensure the availability of these materials at an affordable cost and at the right quality for the students.

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APPENDIX I

DEPARTMENT OF HEALTH, SAFETY AND ENVIRONMENTAL EDUCATION

FACULTY OF EDUCATION, UNIVERSITY OF BENIN,

BENIN CITY, EDO STATE.

QUESTIONNAIRE

THE IMPACT OF LOW COST OF ENVIRONMENTAL MATERIALS ON THE KNOWLEDGE AND ATTITUDES OF STUDENTS TOWARDS THE PROPER SOLID WASTE DISPOSAL.

Dear respondents,

This is designed to examine the the impact of low cost of environmental materials on the knowledge and attitudes of Students towards the proper solid waste disposal. The sole purpose of this research project is academic, and it will be kept private. As such, you are obliged to answer the following questions in a courteous and sincere manner

Thank you.

_____

IBANGA Wisdom

Researcher

Section A

Instruction: please tick (√) as appropriate.

Demographic background.

Gender: Male ( ) Female ( )

Religion: Christianity ( ) Islam ( ) Others ( )

Age: less than 20 years ( ) 20 – 25 years ( ) Above 25 years ( )

Level: 100( ) 200 ( ) 300( )

Course Area: Health Education ( ) Environmental Education ( )

SECTION B: The Impact of Low Cost of Environmental Materials on the Knowledge of Students Towards Proper Solid Waste Disposal

1. Do you have knowledge about proper solid waste disposal? a. Yes ( ) b. No ( ) c. Not sure

2. Which of the following is not a proper method of solid waste disposal a. Open burning ( ) b. Sanitary Land fill ( ) c. Incineration

3. The best place to dispose a trash after usage of the needed item is to a. Throw it inside the bush ( ) b. Dispose it at where everyone is disposing trash ( ) c. In the trash bin ( )

4. The best place for disposing solid waste that are nonrefillable is? a. Open burning ( ) b. Sanitary Land fill ( ) c. Dumping into sea ( )

5. One of these is a proper solid waste disposal method through which natural resources are being recovered and recycled back to the soil? a. Open burning ( ) b. Incineration ( ) c. Sanitary Land fill ( )

6. The proper solid waste disposal also referred to as thermal treatment is? a. Dumping into the sea ( ) b. Sanitary Land fill ( ) c. Incineration ( )

7. Do you know that improper disposal of solid waste can lead to the occurrence of diseases? a. Yes ( ) b. No ( ) c. Not sure

8. It is every students duty to get concerned about proper solid waste disposal because it a. Promotes environmental sustainability ( ) b. Stops waste from being littered ( ) c. It is their responsibility ( )

9. Before disposing solid waste you should -------- a. Dispose in the night ( ) b. Sort out waste properly ( ) c. Tie them properly and dispose everything together

10. What s best way of storing solid waste before disposal a. In bins ( ) b. Gathering them at open spaces ( ) c. Hiding them somewhere ( )

SECTION C: THE IMPACT OF LOW COST OF ENVIRONMENTAL MATERIALS ON THE ATTITUDE OF STUDENTS TOWARDS PROPER SOLID WASTE DISPOSAL

SA= Strongly Agree

A= Agree

D= Disagree

SD= Strongly Disagree

S/N	ITEMS	SA	A	D	SD
11	For a healthful school community, every one should be concerned about proper waste disposal				
12.	A healthy student needs a healthy school school environment				
13.	It is normal to litter anywhere around the campus				
14.	Students should be educated to get actively involved in proper waste disposal in school				
15.	It concerns me if I see solid waste not disposed properly in school				
16.	I get angry whenever I see garbage in the campus				
17.	I am ready to make changes in my lifestyle in order towards solid waste disposal				
18.	Segregating waste would do good to me and other students in the campus				
19.	Open burning of waste is a harmful way of solid waste disposal				
20.	Sorting out my waste for disposal is a waste of time				

APPENDIX II

Reliability

Scale; ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a.Listwisedeletionbasedonallvariablesintheprocedure.

ReliabilityStatistics

Cronbach's Alpha[a]	No of items
.675	20