

COMPARATIVE ANALYSIS OF BILLBOARD POSTERS AS A MEANS OF CURBING LITTERING AND RECYCLING WASTE IN THE UNIVERSITY OF NIGERIA, NSUKKA AND ENUGU STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY, AGBANI

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ABSTRACT

Littering and improper waste disposal remain significant environmental challenges in Nigerian universities, necessitating effective communication strategies to promote responsible waste management. This study conducts a comparative analysis of billboard posters as a tool for curbing littering and encouraging recycling among students of the University of Nigeria, Nsukka (UNN) and Enugu State University of Science and Technology (ESUT), Agbani, Nigeria. The research employs the use of a mixed-method approach, to evaluate the visibility, message retention, and behavioral influence of billboard campaigns in both institutions. Findings indicate that while billboard posters increase awareness, their effectiveness varies based on location, design appeal, and institutional environmental policies. UNN students demonstrated a slightly higher response rate to billboard messaging, attributed to complementary waste management initiatives on campus. The study recommends strategic placement, culturally relevant messaging, and integration with digital media to enhance billboard effectiveness. These findings contribute to environmental sustainability discourse and emphasize the need for multifaceted awareness campaigns in Nigerian universities.

Keywords: Billboard posters, waste management, recycling behavior, environmental communication, university students, Nigeria.

INTRODUCTION

Littering and improper waste management are major global environmental concerns, contributing to pollution, climate change, and public health risks (United Nations Environment Programme [UNEP], 2022). Various strategies have been employed worldwide to address these challenges, including policy enforcement, recycling programs, and public awareness campaigns. Billboard posters have been widely used as an effective means of sensitizing people to the dangers of improper waste disposal and the benefits of recycling (Johannes et al., 2021).

Countries with advanced waste management systems, such as Sweden and Japan, have successfully integrated billboard messaging into their environmental policies. Japan's Ministry of the Environment places billboards in urban areas to provide clear instructions on

waste sorting and recycling (Ministry of the Environment, Japan, 2020). Similarly, the United States' "Keep America Beautiful" initiative has effectively used billboards to discourage littering, leading to a decline in improper waste disposal (Keep America Beautiful, 2021). Schultz et al. (2013) pointed out that repeated exposure to visual reminders strengthens compliance with environmental best practices.

It is evident in literature that Africa faces severe waste management challenges due to rapid urbanization, weak environmental policies, and inadequate waste collection infrastructure (Oguntoyinbo, 2012). Oguntoyinbo further noted that overflowing landfills, street litter, and poor recycling habits contribute to environmental degradation and public health risks. In the same vein, a similar research by Godfrey and Oelofse (2017) noted that poor waste management practices in African countries not only degrade the environment but also pose significant health risks, especially in informal settlements where waste accumulation creates breeding grounds for diseases. To address this, some studies and organisations have suggested billboard posters have been used to educate the public on proper waste disposal and recycling.

In South Africa, billboard campaigns have been used to raise awareness about waste separation and recycling. The Department of Environmental Affairs in South Africa has placed billboards in cities like Johannesburg and Cape Town, emphasizing the importance of responsible waste disposal (Department of Environmental Affairs, South Africa, 2018). A study conducted in Kenya, showed that the "Clean Up Kenya" initiative has incorporated billboard messaging to encourage sustainable waste management practices, which has increased public participation in environmental conservation efforts (Mwasiagi, 2024). These initiatives highlight the effectiveness of billboard campaigns in shaping public attitudes toward waste management in African societies.

Nigeria faces a growing waste management crisis, particularly in urban areas where population growth and inadequate waste disposal infrastructure worsen the problem (Federal Ministry of Environment, Nigeria, 2020). The article further pointed out that improper disposal of waste in streets, drainage systems, and public spaces contributes to flooding, pollution, and health hazards.

Billboard campaigns have been used in some Nigerian cities to promote proper waste disposal. In Lagos State, the Lagos Waste Management Authority (LAWMA) has placed billboards to warn against littering and encourage recycling (LAWMA, 2021). In Enugu and Abuja, local governments and environmental organizations have used billboards to raise awareness about proper waste disposal and recycling practices (Onyishi et al., 2023).

Research have shown that university campuses generate large amounts of waste, including plastic bottles, food wrappers, and paper materials (Eneji et al., 2019). These research revealed that many Nigerian universities struggle with littering, improper waste segregation, and inadequate recycling facilities mainly as a result of the high student population and lack of effective waste management policies further exacerbate the problem.

Littering on campuses not only reduces environmental aesthetics but also poses severe ecological and public health risks, including clogged drainage systems, increased pollution

levels, and the proliferation of disease vectors such as rodents and mosquitoes (Abubakar, 2022). Abubakar further noted that the lack of properly designated waste disposal points and the insufficient number of waste bins further exacerbate the problem, leading to indiscriminate dumping of refuse by students. Additionally, a research by Johannes (2021), showed that weak enforcement of waste management regulations, coupled with low awareness of sustainable waste disposal practices, has contributed to the continued prevalence of littering in university environments.

To address these waste management issues, several studies have recommended increased awareness campaigns, particularly through visual communication strategies such as billboard posters, as a means of educating students on responsible waste disposal and recycling (Eneji, 2019; Daniel & Ibok, 2013). Research have shown that billboard posters can serve as an effective strategy for promoting responsible waste disposal among students since they are highly responsive to visual communication, making billboard campaigns a useful tool for encouraging proper waste disposal habits (Eneji, 2019; Daniel & Ibok).

Many studies have examined littering and its environmental effects (Oguntoyinbo, 2012; Godfrey & Oelofse, 2017) and explored recycling as a strategy for waste management (Department of Environmental Affairs, South Africa, 2018; Mwasiagi, 2024). Research has also highlighted billboard campaigns as a tool for promoting proper waste disposal in African cities, including Lagos, Enugu, and Abuja (LAWMA, 2021; Onyishi et al., 2023). Studies have also been carried out on waste management challenges in universities, emphasizing issues such as improper waste segregation and inadequate recycling facilities (Eneji et al., 2019). However, none of these studies have conducted a comparative analysis of billboard posters as a means of curbing littering and promoting recycling, particularly in university settings. It is against this backdrop that this study investigates the comparative effectiveness of billboard posters in curbing littering and promoting recycling at the University of Nigeria, Nsukka, and Enugu State University of Science and Technology.

THEORETICAL FRAMEWORK

The Theory of Planned Behavior (TPB), proposed by Icek Ajzen in 1991, explains how human behavior is influenced by intentions shaped by attitudes, subjective norms, and perceived behavioral control. Attitude refers to an individual's evaluation of a behavior as favorable or unfavorable. Subjective norms involve perceived social pressure to engage or not engage in a behavior, while perceived behavioral control reflects an individual's belief in their ability to perform the behavior (Ajzen, 1991).

In the context of waste disposal, students' attitudes, peer influence, and perceived ease of proper waste management determine their actions. If they view proper waste disposal as beneficial, believe their peers support it, and feel capable of doing it, they are more likely to engage in it. This theory is relevant as billboard posters aim to shape attitudes, reinforce social norms, and enhance students' perceived control over waste disposal and recycling practices.

Study Hypotheses

Based on the Theory of Planned Behavior (TPB), the following hypotheses are formulated:

1. H₁: Billboard posters have a significant positive influence on students' attitudes toward proper waste disposal and recycling at UNN and ESUT.

2. H₂: Subjective norms and perceived behavioral control significantly influence students' intention to adopt proper waste disposal and recycling behaviors in UNN and ESUT.

Testing the Hypotheses Using TPB

To test H₁, the study will assess whether students who are frequently exposed to billboard messages develop more positive attitudes toward proper waste disposal and recycling. This can be measured through surveys or interviews evaluating students' perceptions of waste management before and after exposure to billboards. According to TPB, if students perceive waste disposal and recycling as beneficial and necessary (positive attitude), they will be more likely to engage in it (Ajzen, 1991).

For H₂, the study will evaluate whether students' waste management behaviors are influenced by subjective norms (perceived social expectations from peers, lecturers, or university authorities) and perceived behavioral control (availability of waste bins, ease of recycling). TPB suggests that students who believe their social environment expects them to dispose of waste properly and who feel they have the resources to do so will have stronger behavioral intentions (Ajzen, 2002).

METHODOLOGY

The study area is The University of Nigeria, Nsukka (UNN) and Enugu State University of Science and Technology (ESUT), Agbani, Nigeria. The University of Nigeria, Nsukka (UNN) and the Enugu State University of Science and Technology (ESUT) are two major higher institutions in Enugu State, Nigeria, contributing significantly to education and research. UNN comprises 17 faculties and 102 academic departments, offering 108 undergraduate and 211 postgraduate programs, with a student population of over 36,000 spread across its four campuses: Nsukka, Enugu (UNEC), Ituku-Ozalla (University of Nigeria Teaching Hospital), and Aba (UNAC). It is located in Nsukka. ESUT, on the other hand, operates with 10 faculties and a College of Medicine, with an enrollment of over 50,000 students. It is situated in Agbani, within an urbanized setting close to Enugu metropolis.

This study adopted a cross sectional survey design. The cross sectional survey design is a type of sample survey which focuses on collecting data at one point in time and sampling of different sub-groups carried out. Therefore it is most suitable as a design to study the analysis of billboard posters as a means of curbing littering and recycling waste in the University of Nigeria Nsukka and Enugu state university of science and technology also because it will enable the researcher to make use of drawn sample which represents various elements of the population under study.

Using the Yaro's formula, the study made use of 0.07 point of error limit to calculate the total sample size. An estimated total sample size of hundred and fifty (150) was drawn from the five (5) faculties in UNN while hundred and fifty (150) was drawn from the five (5) faculties in ESUT.

The study utilized structured questionnaire and in-depth interview guide (IDI) as the instruments for data collection. The questionnaire was segmented into two parts. The first part of the questionnaire is the classification section which comprises the socio-demographic data of the respondents.

The method of data collection was self administered. Two (2) research assistants were recruited by the researcher to help in the distribution of the questionnaire in the different part of the university. The questionnaires were distributed to the respondents after each class at student's disposal at different times of the days as a result of time constraints.

The Quantitative data collected from the field was analyzed using frequency distribution tables and simple percentages. The statistical package for the social sciences (SPSS) version 28 was used to code the data for detailed analyses of hypotheses while, chi-square(X²) will help to determine the nature of the strength that exists between the variables under study. For qualitative data, a contextual method of data analysis was adopted. Audio recordings obtained during the interview sessions were transcribed and effectively applied to the work.

RESULTS

4.1 Data Presentation

The demographic profile of the respondents, as presented in Table 4.1, reveals a balanced gender distribution, with 45% male and 55% female participants. The majority of respondents fall within the 25-30 age group (30%), followed by 31-35 (24.3%), 41+ (26.3%), and 36-40 (19.3%), indicating a relatively young population. In terms of marital status, an overwhelming 98% are single, while only 2% are married, with no respondents identifying as separated or widowed. Regarding education, the largest proportion of respondents (34.2%) are at the 200 level, followed by 400 and above (31.2%), 100 level (19.3%), and 300 level (14.3%), suggesting that most participants are in the middle or advanced stages of their academic journey.

Table 4.1: Demographic profile of the respondents

Demographic information	Frequency	percent
Gender		
Male	135	45%
Female	165	55%
Age		
25-30	90	30.0%
31-35	73	24.3%
36-40	58	19.3%
41+	79	26.3%
Marital Status		
Single	294	98%
Married	6	2.0
Separated	0	0%
Widowed	0	0%
Education Level		
100	58	19.3%
200	101	34.2%
300	43	14.3%
400 and above	97	31.2

Source: Field Survey, 2025

Table 4.3: Substantive issues in the study

Demographic information	Frequency	percent
Do you notice billboards in school		
Yes	163	54.3%
No	137	(45.7%)
Factor that influences their retention of billboard messages		
Location of the billboard	91	30.3%
Relevance of the message	73	24.3%
Design and visual appeal	74	24.7%
Frequency of exposure	59	19.7%
How billboard campaigns influence their behavior		
Very influential	186	62.0%
Neutral	60	20.0%
Somewhat influential	30	10.0%
Not influential at all	24	8.0%
On how effective billboard posters are in encouraging proper waste disposal and recycling in thier institution		
Very effective	59	19.7%
Moderately effective	103	34.3%
Slightly effective	41	13.7%
Not effective at all	97	32.3%
How often do you see billboard on issues of proper waste disposal		
Very often	35	11.7%
Often	48	16.0%
Occasionally	60	20.0%
Rarely	120	40.0%
Never	38	12.3%

Source: Field Survey, 2025

QUALITATIVE RESPONSES

These responses are structured as direct quotes from respondents, reflecting their experiences, perceptions, and attitudes toward billboard campaigns on waste disposal and recycling within their universities.

Effectiveness of Billboard Posters in Encouraging Proper Waste Disposal and Recycling

Students from the University of Nigeria, Nsukka (UNN) and Enugu State University of Science and Technology (ESUT), Agbani, Nigeria shared mixed opinions on the effectiveness of billboard posters in promoting proper waste disposal and recycling. Many acknowledge seeing billboards around campus, particularly near main gates and student activity areas. However, they often ignore them unless the message is striking, well-placed, and visually appealing. Some students feel that poor placement reduces impact, suggesting high-traffic areas like hostels, cafeterias, and lecture halls for better engagement.

Several respondents believe the message content matters significantly. Generic slogans like "Keep the school clean" are often ignored, while messages explaining the environmental impact of littering or the benefits of recycling could capture more attention. Additionally, bold fonts, bright colors, and creative designs enhance visibility and recall.

A few students pointed out that the frequency of exposure influences message retention. Seeing a billboard daily increases awareness, whereas isolated or hidden billboards have little effect. Others argue that billboards alone are insufficient; their effectiveness would improve if accompanied by strategic actions such as providing visible waste bins, regular waste collection, and stricter enforcement of waste management policies.

Some students remain skeptical, stating that most people still litter despite the presence of billboards. They suggest that universities should implement stricter rules, fines, and incentives for recycling. Others recommend interactive approaches, such as QR codes leading to awareness videos, to enhance engagement.

Many students feel that billboards promoting proper waste disposal are either rare or not strategically placed. Some notice them occasionally but believe they are overshadowed by advertisements for events, products, and political campaigns. Others admit they have never seen such billboards, suggesting that they are not in prominent locations. Even when present, some argue that the messages lack impact, as students often walk past without noticing. To improve effectiveness, students recommend placing billboards in high-traffic areas like lecture halls and libraries, using engaging visuals, and delivering stronger, more compelling messages.

DISCUSSION OF FINDINGS

The findings reveal that while billboard posters are a visible medium for promoting proper waste disposal and recycling, their effectiveness varies based on factors such as location, message relevance, design appeal, and frequency of exposure. A majority of respondents (54.3%) reported noticing billboards in their institutions, yet a significant proportion (45.7%) did not, indicating that visibility remains a challenge. Among the factors influencing message retention, 30.3% of students cited location as the most important, followed by design appeal (24.7%), relevance of the message (24.3%), and frequency of exposure (19.7%). These responses suggest that students are more likely to engage with billboards that are strategically placed in high-traffic areas and contain visually compelling and meaningful messages.

Regarding behavioral influence, 62.0% of respondents found billboards to be very influential, while 20.0% remained neutral, 10.0% found them somewhat influential, and 8.0% considered them ineffective. However, when asked about the effectiveness of billboards in promoting waste disposal and recycling, only 19.7% found them very effective, while 34.3% rated them moderately effective, 13.7% slightly effective, and a considerable portion found them ineffective. This suggests that while billboards raise awareness, they may not always lead to behavioral change.

These findings align with Daniel and Ibok (2013), who found that awareness alone does not necessarily translate into action, as students in Nigerian universities often neglect waste disposal regulations despite campaigns. Similarly, Eneji et al. (2019) highlighted that while

environmental education can enhance waste management behavior, enforcement mechanisms and infrastructure—such as readily available waste bins—play a crucial role in sustaining behavioral change. This is supported by some respondents who suggested that billboards should be supplemented with practical measures, such as better waste collection systems, stricter enforcement, and incentives for recycling.

On the other hand, some students noted that billboards on waste disposal are overshadowed by advertisements for events and political campaigns, reducing their visibility. This contrasts with Abubakar et al. (2022), who emphasized that effective waste management strategies in developing countries require continuous public engagement and reinforcement through multiple communication channels. In this regard, some respondents proposed integrating interactive elements, such as QR codes linking to awareness videos, to enhance engagement and recall.

Conclusion and Recommendations

The study concludes that while billboard campaigns in universities help raise awareness about proper waste disposal and recycling, their effectiveness in influencing student behavior remains limited. Many students acknowledge seeing billboards, but their retention and engagement depend on factors such as location, message relevance, design appeal, and frequency of exposure. Billboards placed in high-traffic areas with visually compelling designs and informative content are more likely to capture attention. However, awareness alone does not always lead to behavioral change, as many students continue to litter despite the presence of billboards. This highlights the need for complementary waste management strategies, such as accessible waste bins, stricter enforcement policies, and incentives for recycling.

Based on these findings, the following recommendations are made:

1. Strategic Placement – Universities should ensure billboards are placed in high-traffic areas such as lecture halls, hostels, cafeterias, and entrances to maximize visibility.
2. Engaging Content – Messages should go beyond generic slogans and include educational content on the environmental impact of littering and the benefits of recycling. Bold fonts, bright colors, and creative visuals should be used to enhance recall.
3. Integration with Other Strategies – Billboards should be supported by practical measures such as more waste bins, regular waste collection, and recycling incentives to reinforce positive behavior.
4. Interactive Approaches – Universities should consider adding QR codes to billboards, linking students to educational videos or campaigns on waste management.
5. Policy Enforcement – Institutions should introduce penalties for littering and reward students who actively participate in recycling programs.

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