

Predictors of Electronic Wastes Disposal Behaviour Among Young Adults in South-South, Nigeria

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Abstract: *This study empirically investigates the predictors of electronic waste disposal behavior among young adults in Uyo, Nigeria. Employing a quantitative survey design, data were collected from a population of young adults who have been active users of electronic/electrical gadgets for the past five years. Given the infinite nature of this population, a non-probability sampling method, specifically quota sampling, was adopted. The sample size was determined using the formula for sample size estimation. The research instrument, a questionnaire, underwent validation procedures, including face validity, content validity, and construct validity. Reliability testing was conducted using Cronbach's alpha coefficient. The data collected were analyzed using descriptive and inferential statistics, with multiple regressions employed to test the hypotheses. Additionally, Structural Equation Modeling (SEM) was employed to confirm the results of the multiple regressions and assess the model's fitness for the data. The findings of this study indicate several significant determinants of electronic waste disposal behaviour among young adults in Uyo, Nigeria. Notably, attitude emerges as a pivotal driver of electronic waste disposal behavior, aligning with prior research conducted across diverse geographic and cultural contexts. This highlights the universal importance of cultivating a positive attitude towards responsible e-waste disposal, irrespective of regional disparities. Conversely, the study reveals that subjective norms do not exhibit a positive and significant association with electronic waste disposal behavior. Furthermore, perceived behavioral control is found to have a significant impact on electronic waste disposal behavior. The influence of environmental knowledge, however, is less pronounced than previously suggested. The research also emphasizes the influential role of individual responsibility in shaping*

electronic waste disposal behavior. The multifaceted nature of electronic waste disposal behavior is underscored, necessitating a context-specific approach to interventions and policies. Based on these findings, it was recommended that the promotion of attitudinal change, context-specific interventions, enhancement of perceived behavioral control, reassessment of environmental knowledge strategies, empowerment of individual responsibility, cross-cultural comparative studies, and the development and implementation of tailored policies to address the unique challenges of this demographic. This research offers valuable contributions to the scholarly discourse on e-waste management and informs strategies for sustainable and environmentally conscious communities.

Keywords: electronic/electrical wastes, disposal behaviour, attitude, subjective norm, perceived behavioural control, environmental knowledge, individual responsibility, young adults, Nigeria.

INTRODUCTION

The surge in electrical and electronic waste (e-waste) has become a conspicuous global concern over the past few decades. E-waste refers to the discarded or obsolete components derived from technological and telecommunication devices. This proliferation is primarily driven by the rapid obsolescence of devices, where advancements in artificial intelligence and other cutting-edge technologies necessitate the continual replacement of existing technologies. The accelerated turnover of these devices contributes significantly to the accumulation of e-waste, exacerbating improper disposal practices and highlighting the lack of effective recycling systems. Such practices have far-reaching environmental and societal consequences, ranging from air and water pollution to ozone layer depletion and coastal erosion. These environmental impacts underscore the critical need for targeted interventions to promote the responsible disposal of e-waste, particularly among young adults, who constitute a substantial proportion of consumers of electrical and electronic devices.

Zhao (2023) posits that e-waste disposal practices vary significantly between and within affluent and developing economies, rendering disposal models developed for high-income countries unsuitable for low-income regions. Furthermore, Kumar, Holuszko, and Espinosa (2017) emphasize the correlation between a country's Gross Domestic Product (GDP) and the volume of e-waste generated, noting that countries with higher GDPs often produce significantly greater quantities of e-waste. The findings of Awasthi, Li, Koh, and Ogunseitan (2019) indicate that global e-waste production has surpassed 44.7 million

metric tons, with substantial contributions from nations such as China and Nigeria. This alarming trend highlights the international urgency of addressing e-waste disposal. Developing nations, which often serve as repositories for obsolete electronic devices discarded by wealthier countries (Sthiannopkao & Wong, 2013), face unique challenges, particularly due to the informal nature of their economies. Effective measures to mitigate e-waste must therefore consider the socio-economic and cultural contexts of these regions. The improper disposal of e-waste is particularly problematic in developing countries, including Nigeria, where insufficient waste management infrastructure and limited public awareness exacerbate environmental challenges. Meen, Ahmed, Hossain, and Khan (2021) observe that the mismanagement of e-waste frequently results in air and water pollution, further contributing to ecological degradation. Within Nigeria, the South-South region plays a prominent economic role, yet the region's capacity to manage e-waste effectively remains constrained. Understanding the behavioral determinants of e-waste disposal, particularly among young adults in this region, is imperative. Such insights enable policymakers and advocates of pro-environmental initiatives to design appropriate frameworks for promoting ethical and sustainable disposal practices.

Despite the substantial body of literature on pro-environmental behavior and e-waste management (e.g., Wang et al., 2019; Zhao, 2023; Borthakur & Govind, 2017), most studies have focused on developed nations. Consequently, the models derived from these studies often lack applicability to developing economies characterized by extensive informal economic activities. Additionally, research on the extension of the Theory of Planned Behavior (TPB) in predicting e-waste disposal behavior among young adults is sparse, particularly in the South-South region of Nigeria. The TPB, a widely recognized model for understanding pro-environmental behavior (Ajzen, 1991; Vijayen et al., 2019), provides a robust framework for examining the behavioral, normative, and control factors influencing individual actions. However, its application in the context of developing economies remains underexplored. Addressing this gap necessitates a regional analysis that considers the unique socio-economic dynamics of the South-South region.

This study aims to empirically investigate the predictors of e-waste disposal behavior among young adults in Uyo, Nigeria, a key urban center in the South-South region. By examining factors such as attitudes, subjective norms, and perceived behavioral control, this research seeks to provide a nuanced understanding of e-waste management in the region. The findings are expected to offer valuable insights for policymakers, environmental advocates, and sustainability marketers, fostering the development of tailored strategies to promote responsible e-waste disposal practices. Ultimately, this study highlights the critical importance of addressing e-waste disposal within the broader discourse on environmental sustainability and the need for context-specific interventions in developing economies.

REVIEW OF RELATED LITERATURE

Electronic Waste Disposal Behavior

The proliferation of electronic waste, commonly referred to as e-waste, has become a pressing global concern. E-waste primarily originates from used or outdated electrical and electronic devices, with a substantial portion arising from telecommunication and technology gadgets. This surge in e-waste generation over the past few decades can be attributed to various factors, including the rapid obsolescence of existing devices due to the relentless introduction of newer technological and telecommunication counterparts.

The accelerated rate at which modern devices outpace their predecessors has led to an alarming turnover of electronic equipment. Consequently, many once state-of-the-art devices become obsolete in a remarkably short span of time, further contributing to the mounting e-waste predicament. Furthermore, the advent of artificial intelligence in the technology sector has rendered a significant proportion of current electrical and electronic devices outdated. This, in turn, necessitates the development of devices that align with the latest technological trends, amplifying the burden of e-waste on our environment. As a result of these intertwined factors, there has been a noticeable surge in the improper disposal and recycling of e-waste, causing adverse consequences for both our social and natural surroundings.

Zhao (2023) highlights that the disposal habits related to e-waste exhibit significant variations across and within affluent and developing economies. This discrepancy underscores the need to recognize that e-waste disposal behavior in a developed economy may not be directly applicable to a developing country, given the socio-economic disparities and varying levels of technological penetration. Therefore, a nuanced and context-specific approach is imperative to address the disparities in e-waste disposal behavior, which may vary significantly even within the boundaries of a single nation. Kumar, Holuszko, and Espinosa (2017) draw attention to the correlation between a country's gross domestic product (GDP) and the volume of e-waste it generates. Their research reveals a positive association, suggesting that countries with higher GDPs tend to produce larger quantities of e-waste. This aligns with Awasthi, Li, Koh, and Ogunseitan's (2019) assertion that the global volume of e-waste has now surpassed a staggering 44.7 million metric tons. Much of this waste emanates from nations such as China and Nigeria, underlining the international magnitude of the e-waste problem. Therefore, it is crucial to recognize that the issue of e-waste hazards has escalated to a pinnacle on the international stage, as emphasized by Mohan (2008).

Addressing the e-waste challenge demands an immediate and comprehensive approach, and a key aspect of this is fostering responsible e-waste disposal behavior. This is

particularly pertinent among young adults, who constitute a significant portion of both current and potential consumers of electrical and electronic devices. With their prominent role in driving the demand for these products, young adults have a crucial role to play in the endeavor to mitigate the growing crisis of e-waste and its associated environmental and social repercussions.

Conclusively, the escalation of electronic waste presents a multifaceted challenge with far-reaching environmental, social, and economic implications. As the generation of e-waste continues to surge due to rapid technological advancements, it is imperative to tailor approaches to e-waste disposal behavior according to the unique socio-economic and technological contexts of different regions. Moreover, recognizing the correlation between a nation's GDP and e-waste production underscores the necessity for comprehensive, international collaboration to address this global crisis. Prioritizing the cultivation of responsible e-waste disposal behavior, particularly among young adults, is an essential component of any comprehensive strategy to mitigate the detrimental impacts of mounting e-waste on our world.

FACTORS THAT INFLUENCE ELECTRONIC WASTE DISPOSAL BEHAVIOUR

Attitude

Attitude, in the realm of psychology, represents a relatively enduring and consistent proclivity towards certain behaviors, contingent upon an individual's cognitive recognition and preferences pertaining to people, events, objects, and their surrounding environment (Olsson & Zama, as cited in Tsai, 2010). According to the work of Huang and Chuang (2007), attitudes are discerned by the amalgamation of behavioral beliefs, which encompass salient convictions regarding the potential consequences, and the corresponding assessments of these outcomes.

Conner and Armitage (1998) posit that an individual's attitude towards a particular behavior exerts its influence on that individual's subsequent actions through the mediation of intentions. The conception of attitude towards a behavior can be succinctly defined as the extent to which an individual positively or negatively appraises the performance of that behavior. This evaluation, in turn, is shaped by the entirety of accessible behavioral beliefs that interconnect the behavior under consideration with a plethora of outcomes and other cognitive attitudes (Ajzen, 1999). This orientation towards a particular behavior is malleable and is molded by a nexus of beliefs and new experiences, both of which have the capacity to reinforce or attenuate existing convictions. Consequently, it is justifiable to assert that the study of attitudes towards behaviors bears significant merit in discerning the determinants of behavioral intentions.

Subjective Norms

The subject matter under discussion pertains to the perspectives of individuals of paramount significance in a consumer's life concerning their actions, as well as the underlying motivations that drive consumers to adhere to the views of these pivotal figures (Fishbein & Ajzen, as cited in Schubert, 2008). These pivotal figures, as articulated by Schubert (2008), encompass individuals who maintain a close or pivotal role in the life of the consumer, including but not limited to parents, siblings, close friends, relatives, subordinates, supervisors, and business partners.

Fishbein and Ajzen (as cited in Tsai, 2009) have conceptualized subjective norm as an outcome arising from a synthesis of normative beliefs and the motivation to comply. According to Tsai (2009), normative beliefs encapsulate the perceived pressures exerted on individuals in relation to their actions or inactions concerning behaviors relevant to individuals or organizations of significance to them. Furthermore, Tsai (2009) posits that motivation to comply denotes the willingness of individuals to align their behaviors with the expectations of influential figures when deciding whether to engage in a particular behavior or refrain from it.

Huang and Chuang (2004) underscore that subjective norms are contingent upon the multiplication of normative beliefs, which constitute salient beliefs regarding how influential figures view a given behavior, by the motivation to comply. This conceptualization accentuates the pertinence of social pressures, particularly when individuals are engaging in novel actions or activities that fall outside their realm of expertise. It is worth noting that the influence of reference groups varies depending on the context, such as in the realm of leisure services as opposed to obligatory utilization of new services in a workplace setting (Ajzen, 1991).

Perceived Behavioural Control

According to Ajzen (1991, as cited by Schubert, 2008), the concept of perceived behavioral control pertains to individuals' subjective appraisal of the ease or difficulty associated with performing a specific behavior of interest. Huang and Chuang (2004) expound that this perception is influenced by control beliefs, which encompass the salient convictions regarding available resources, opportunities, obstacles, and impediments. These beliefs are weighted by the perceived level of ease with which the behavior can be executed. As articulated by Tsai (2009), for an individual to engage in a given behavior, they must possess the capacity to manage objective situational factors, such as access to resources, time, and financial means. Perceived behavioral control represents a composite construct, which incorporates control beliefs concerning factors that either facilitate or obstruct the behavior, coupled with the extent of control an individual believes they possess over these determinants (Ajzen, as cited in Tsai, 2009).

Environmental Knowledge

Ajzen (1991) posits that the Theory of Planned Behavior (TPB) remains amenable to refinement through the incorporation of supplementary determinants, provided that empirical evidence substantiates their capacity to elucidate a substantial proportion of the variance in intention or behavior, even after accounting for the theory's existing variables (Ajzen, 1991). It is on this premise that other variables were included. Awareness and knowledge pertaining to the environmental implications of electronic waste (e-waste) have a profound influence on the disposal and recycling behaviors of individuals and organizations. As modern society becomes increasingly reliant on electronic devices, the management of e-waste emerges as a critical concern due to its potential adverse effects on natural environments. Consequently, a comprehensive understanding of the environmental impact of e-waste is vital to foster responsible e-waste disposal practices.

E-waste, encompassing discarded electronic and electrical equipment, poses a multifaceted challenge to environmental sustainability. Improper disposal and management of e-waste can result in various environmental and health hazards, including soil and water contamination, release of toxic chemicals, and depletion of natural resources (Alzubaodi, Slade, & Dwivedi, 2018). Therefore, the awareness and knowledge surrounding these issues are pivotal in determining how individuals, businesses, and policymakers engage with e-waste disposal.

Environmental knowledge in the context of e-waste disposal encompasses the comprehension and recognition of the detrimental consequences associated with improper handling and disposal of electronic equipment. When users and consumers are well-informed about these impacts, they are more likely to adopt responsible disposal and recycling behaviors (Borthakur & Govind, 2018). The significance of environmental knowledge lies in its potential to bridge the gap between awareness and action, as individuals equipped with a clear understanding of the environmental consequences are more inclined to act in environmentally responsible ways.

At the individual level, awareness and knowledge regarding e-waste are instrumental in shaping consumer behavior. Individuals who are cognizant of the environmental harms caused by e-waste often make more informed choices when purchasing electronic devices and are more likely to participate in recycling programs or engage in proper disposal methods. This, in turn, contributes to a reduction in the negative environmental impacts associated with e-waste.

Moreover, businesses and organizations play a pivotal role in managing e-waste, especially when dealing with obsolete equipment. An acute understanding of the environmental ramifications of improper e-waste disposal can lead to the implementation of

comprehensive e-waste management strategies. Such strategies may involve partnering with certified e-waste recyclers or adopting environmentally sustainable practices in the disposal of electronic equipment. By embracing these practices, organizations can fulfill their corporate social responsibility and mitigate the environmental harm caused by e-waste.

In the policymaking realm, the role of awareness and knowledge is equally critical. Governments and regulatory bodies can design and enforce e-waste management policies and regulations more effectively when there is a widespread understanding of the environmental repercussions. This includes setting up e-waste collection and recycling programs, ensuring that manufacturers take responsibility for their products' end-of-life management, and promoting extended producer responsibility (EPR) programs. EPR initiatives, for example, incentivize manufacturers to design products that are more environmentally friendly and easier to recycle, thus reducing the environmental burden associated with e-waste.

Individual Responsibility

The environmental responsibility, encompassing both the natural and social aspects, is a critical factor influencing an individual's behavioral responses in specific situations or events. As Kumar (2019) postulates, the domain of e-waste recycling and disposal behavior, particularly among young adults, is significantly impacted by the level of individual responsibility. In this context, individual responsibility can be dissected into two primary dimensions: moral responsibility and conventional responsibility. These dimensions serve as pivotal measures that help gauge an individual's sense of responsibility in matters concerning e-waste management and disposal.

Moral responsibility, the first dimension of individual responsibility, is rooted in an individual's ethical considerations and values. It involves a deep-seated sense of duty towards environmental stewardship. Young adults who exhibit high levels of moral responsibility are more likely to take environmentally responsible actions in the context of e-waste recycling and disposal. Their actions are guided by a strong internal moral compass, driving them to make choices that align with their ethical beliefs, even when faced with competing factors.

Conventional responsibility, on the other hand, pertains to an individual's adherence to established societal norms, regulations, and expectations related to environmental responsibility. Conventional responsibility is influenced by external factors, such as legal obligations and social norms. Individuals who exhibit high conventional responsibility tend to conform to existing rules and norms related to e-waste recycling and disposal, ensuring

compliance with environmental regulations and engaging in responsible behavior due to societal expectations.

Hypotheses Development

(i) Nexus between Attitude and E-waste Disposal Behaviour.

Attitude is a prominent factor affecting behavioural disposition of a consumer to certain product (Ghen and Liu, 2004). Individual's attitude is a strong predictor of behavioural intention (Bock and Kim, 2002). Attitude serves as an indispensable predictive construct for explaining behavioural intention (Huang and Chuang, 2007). Tweneboach-Kudoah, Adams and Nyarku (2019) assert that attitude is the strongest predictor waste disposal behaviour. It is on this premises we hypothesized as follows:

H₁: Attitude has a positive and significant effect on e-waste disposal behaviour among young adults.

(ii) The Relationship Between Subjective Norms and E-waste Disposal Behavior.

Tsai (2009) opines that subjective norms can predict behavioural intention. The study of Tweneboah-Kudgah, Adams and Nyarku (2019) corroborates the opinion of Tsai (2009) that subjective norm is a major predictor of waste disposal behavior. Moreover, Vijayen et al (2023) assert that subjective norms is a strong and major predictor of e-waste recycling behavior. Based on the foregoing, we hypothesized that:

H₂: Subjective norms has a positive and significant effect on e-waste disposal behavior among young adults.

(iii) Perceived Behavioural Control and E-waste Disposal Behaviour

Ajzen (1991) states that perceived behavioral control simply refers to the perception of people regarding the ease or difficulty encountered in the course of performing certain behavior. If a person is to carry out a function, they are obliged to have control over the objective situations like time, money and other resources (Tsai, 2009). Perceived behavioural control is reported as a strong predictor of e-waste recycling behavior. (Vijayen et al, 2009, Fehegaray & Itansstein, 2016; Wang et al, 2019). Based on these assertions, we hypothesized as follows:

H₃: Perceived behavioural control has a positive and significant effect on e-waste disposal behaviour among young adults.

(vi) Environmental knowledge and E-waste Disposal Behaviour

Awareness knowledge of the impact of e-wastes on the natural environments has a major influence on e-waste disposal and recycling behaviour (Alzubaodi, Slade and Dwivedi,

Nid; Borthakur & Govind, 2018). Environmental knowledge is a situation whereby users and consumers of e-wastes are fully aware about the detrimental effects the improper disposal of e-wastes has on the prevailing environment. Based on the above assertion, we hypothesized that:

H4: Environmental knowledge has a positive and significant effect on e-waste disposal behaviour among young adults.

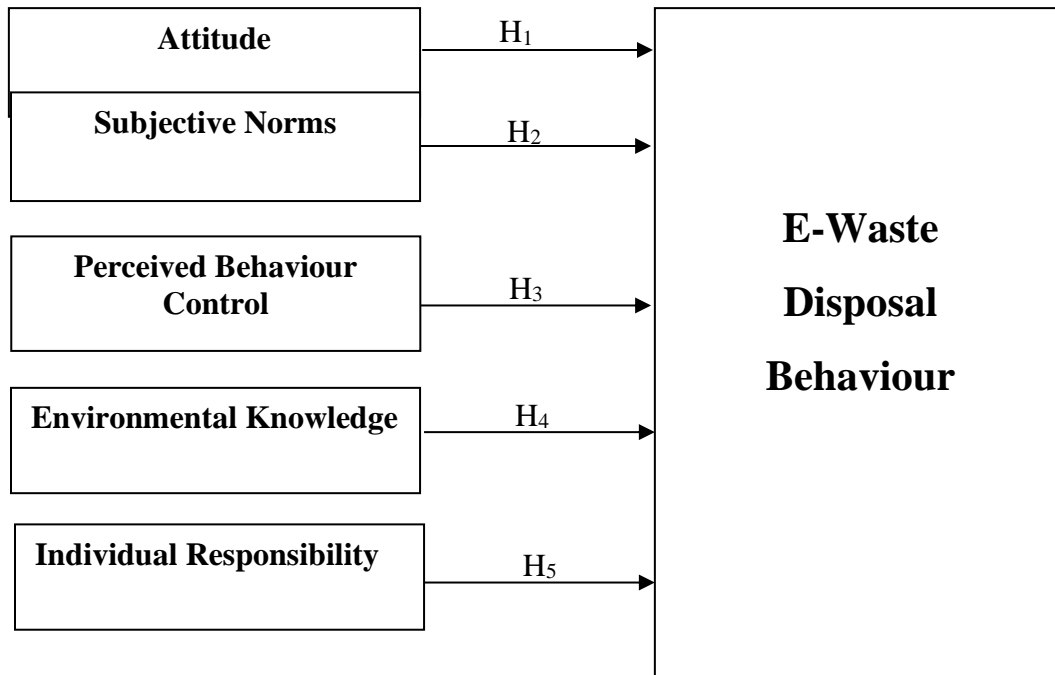
(v) Effect of Individual Responsibility on E-waste Disposal Behaviour

The level of responsibility to the environment (natural and social) can influence one's behaviour regarding a particular situation or event. Kumar (2019) opines that in terms of e-waste recycling and disposal behaviour among young adults, individual responsibility level plays a significant role. Moral responsibility and conventional responsibility are the major measures of individual responsibility. Individual responsibility is a feeling that is attributed to one's deliberate resolution to act responsibly. Based on this foregoing, it is hypothesized as follows:

H5: Individual Responsibility has a positive and significant effect on e-waste disposal behaviour among young adults.

Theoretical Framework

This research is rooted in the Theory of Planned Behavior (TPB) proposed by Ajzen in 1991. While the TPB serves as the foundational framework for this study, it has been extended to accommodate the unique nuances of pro-environmental behavioral investigations. The TPB is renowned for its emphasis on elucidating the underlying determinants that govern an individual's inclination to engage in specific behaviors. In this particular study, the adoption of the TPB is predicated on its extensive applicability within the realm of pro-environmental conduct, with a particular focus on the domain of e-waste disposal and recycling. Noteworthy contributions in this context can be found in the works of Kumar (2019), Aboelmegeed (2020), Miner et al. (2020), and Wang et al. (2019). The incorporation of the TPB into this research is guided by its instrumental role in facilitating the attainment of the primary objective of this study.



Source: *Researcher's conceptualization, 2023*

Figure 1: Proposed Research Schema

Empirical Review

Wang, Ren, Dong, Zhang and Wang (2019) carried out a study in China with the aim to determining the factor shaping willingness towards n-line recycling behaviour. The study focused on 1225 households in seven regions in China. The study was premised on the theory of planned behaviour. The findings show that perceived behavioural control, subjective norms, attitudes and economic motivation have significantly positive impact on willingness to on line recycling behaviour.

Moreso, in a study conducted in Brazil by Fehegaray, and Hansstein (2016) with the main objective of assessing the intention –behaviour gap in electronic waste recycling. The study was anchored on the theory of planned behaviour data were collected via telephone survey. One –way analysis of variance (ANOVA) and logit regression were employed to test the hypotheses formulated. It was found out that the majority of the respondents have a positive intention towards electronic appliances' recycling. The study concludes that the theoretical appeal of theory of planned behaviour to explain intention to recycle e-waste is valid when empirically investigated.

Also, a worldwide overview with special focus on India regarding emerging trends in consumers' E-waste disposal behaviour and awareness was conducted by Borthakur and Govind (2017). The study observed significant differences in consumers' E-waste disposal behaviour not only between the developed and developing countries but between these countries. That the complexities in Indian's e-waste management is a function of multifaceted economic and cultural differences.

Moreover, in understanding residents' preferences for e-waste collection in China with reference to waste mobile phones; Qu, Wang, Lin and Zhn (2019), carried out an empirical investigation. Both interview and questionnaire were used to collect data from 197 respondents. The hypotheses were analyzed using conjoint analysis. The results show that the collecting price and collector and quality certification are the most significant attributes, while collecting channels and collecting modes are the least important.

Also, Botetzagias, Dima and Malesios (2015) investigated extended theory of planning behaviour in the content of recycling using moral norms and demographic predictors as moderators. The study was conducted among Greek citizens and was based on the theory of planned behaviour. The research instrument was questionnaire. The hypotheses formulated were tested using partial least square-structural equation modeling (PLS-SEM). It was revealed that perceived behavioural control is the most predictor of intention to recycle e-waste, followed by moral norms and then attitude. While demographic characteristics and subjective norms were statistically non-significant predictors of intention to recycle.

In similar vein, Alzubaidi, Slade and Dwivedi (n.d) carried out research on the antecedents of consumers' pro-environmental behaviours in Saudi Arabia. Survey method was used to collect quantitative data from U3 respondents. The hypothesized relationships formulated were tested using structural equation modeling. The findings show that consumers' intentions to adopt direct and indirect pro-environmental behaviours are influenced by innovativeness, materialism, perceived consumer effectiveness and environmental concern but not by social influence.

Kumar (2019) carried out a study with the objective to explore young adults' e-waste recycling behaviour using the extended theory of planned behaviour doing a cross-cultural study between China and India. The research instrument was questionnaire. The hypotheses were tested using partial least square structural equation modelling (PLS-SEM). It was found out that attitude, perceived behavioural control, subjective norms and individual responsibility are positively significantly to e-waste recycling intention while consequences awareness and convenience have non-significant effect on intention to recycle e-waste.

Wang, Guo and Wang (2016) conducted a study in China on the factors influencing residents' e-waste recycling behavioural intentions. The study was anchored on modified TPB. Questionnaire was employed as the research instrument. Exploratory factor Analysis (EFA) was used for factor reduction while structural equation modelling (SEM) was used to test hypotheses. It was revealed that environmental awareness, attitude towards recycling, perceptions of informal recycling, income and costs of recycling and norms and publicity which indirectly affected resident behavioural intentions towards e-waste recycling behaviour.

Laequddin, Kareem Abdul, Sahay and Tiwari (2022) carried out a study with the aim of investigating the factors that influence the safe disposal behaviour of e-waste by electronics consumers in India. Questionnaire was used as the research instrument while the data were collected via a cross-sectional survey. Data collected were analysed using descriptive statistics and the hypotheses were tested using partial least squares-structural equation modelling (PLS-SEM). The findings show that awareness, convenience, subjective norms, producer interventions and regulations were found to be positively significantly impact safe disposal behavioural intentions.

Haj-Salem and Al-Hawari (2021) did a study in United Arab Emirate (UAE) with the purpose of developing a model that includes self-conscious emotions to the theory planned behaviour in e-waste recycling behaviour. Data were collected from 287 respondents using a two-wave survey via questionnaire. PLS-SEM was used to test the hypotheses. It was revealed that anticipated guilts, subjective norms, perceived effort and recycling knowledge are the major predictors of e- waste recycle intention. Attitude and anticipated pride do not significantly predict e-waste intention to recycle.

Vijayan, Krishnan, Parayitan, Duraisami and Saravanaselvan (2023) carried out a study in India with the objective of exploring e-waste recycling behavioural intention among the households. 228 households were surveyed using questionnaire. Hierarchical regression was used for hypotheses testing. Attitude, subjective norms and perceived behavioural control are positively connected to recycling intention and, recycling intentions habits and convenience are favourably significant to recycling behaviour. Attitudes and subjective norms are the major predictors of households inclination to recycle electronic waste. Also, there exist an inverse relationship between perceived behavioural control and the intention to recycle e-waste at home.

METHODOLOGY

The study employed quantitative research design. This research design allows collection of data using a research instrument and making a generalization based on the data collected.

The kind of quantitative research design adopted is survey design. Survey design helps the researcher to elicit information from the respondents by selecting a representative of the respondents.

Furthermore, the study population comprised young adults in Uyo, Akwa Ibom State who are active users of electronic/electrical gadgets for the past 5 years. Young adults are persons within the ages of 18 – 45 years. This kind of population is infinite (unknown) since there is no sampling frame for the unit of analysis.

Since the population of study is infinite, non-probability sampling method was adopted. The kind of non-probability sampling method used was quota sampling. Quota sampling was adopted because it is a near-probability sampling method and applicable to most consumer-based studies in the field of marketing.

Since the population of study is unknown (infinite), the researchers adopted a formula that estimates the representatives of the samples on certain critical parameters at an acceptable level of probability. The formula for sample size determination adopted for this study is:

$$n = \frac{Z^2(S_{\bar{x}})^2}{e^2}$$

n = sample size

Z = Z – value @ 95% confidence limit

$S_{\bar{x}}$ = Sample Variance (after distributing certain numbers of copies of questionnaire among the respondents)

e = Error margin

Source: *Nasab and Alroaya (2013)*.

$Z = 1.96$ (see table of normal distribution)

$S_{\bar{x}} = 0.533$ (after distributing 30 copies of questionnaire among the respondents)

$e = 0.05$

$$n = \frac{(1.96)^2(0.5333)^2}{(0.05)} = 437.03 \approx \mathbf{437}$$

The research instrument used was questionnaire the questionnaire was sub-divided into section A and section B. section A comprised the demographic questions while section B comprised the core questions on the constructs of the study i.e. independent variables and dependent variables.

The validity of the research instrument was tested using face validity, content validity and construct validity. Face validity was conducted by giving the draft copy to experts in the field of sustainability marketing and consumer studies. Construct validity was conducted

by giving the draft copy of the questionnaire to psychometricians and the researcher's supervisors for perusing.

The reliability of the research instrument measures the consistency of the research instrument reliability test was carried out using Cronbach 's alpha coefficient above 0.70 were used for the analysis. Data collected were analyzed using descriptive and inferential statistics. Descriptive statistics was adopted to explain the characteristics of the participants of the study. Multiple regressions were used to test the significance of the hypotheses earlier stated. This was adopted because it indicates which independent variable is the best predictor, the second-best predictor and so on. Also, Structural Equation Modeling (SEM) was employed to test the fitness of the model for data and to confirm the result of the multiple regressions.

DATA PRESENTATION AND ANALYSIS

Data Analysis

This section concerns presentation and analysis of the primary data collected in the course of the study and the instrument used for the primary collection is the questionnaire. Out of 437 copies of the questionnaire distributed, 308(70.5%) were returned as duly filled and usable questionnaire; thus, giving a captive sample size of 308 which was used in the analysis. This response rate is quite high and was informed by the fact that the student/researcher went and distributed the questionnaire himself with the assistance of some students of University of Uyo.

Table 1: Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|-------------------|-----|---------|---------|------|----------------|
| Attitude 1 | 308 | 1 | 5 | 5.68 | 2.268 |
| Attitude 2 | 308 | 1 | 5 | 6.27 | 1.575 |
| Attitude 3 | 308 | 1 | 5 | 6.00 | 1.910 |
| Attitude 4 | 308 | 1 | 5 | 5.68 | 1.989 |
| Attitude 5 | 308 | 1 | 5 | 5.00 | 1.886 |
| Subjective Norm 1 | 308 | 1 | 5 | 5.41 | 2.128 |
| Subjective Norm 2 | 308 | 3 | 5 | 6.45 | .942 |

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| | | | | | |
|------------------------------|-----|---|---|------|-------|
| Subjective Norm 3 | 308 | 1 | 5 | 5.73 | 1.659 |
| Subjective Norm 4 | 308 | 1 | 5 | 4.59 | 2.333 |
| Perceived Behavioural Ctrl 1 | 308 | 1 | 5 | 5.14 | 1.635 |
| Perceived Behavioural Ctrl 2 | 308 | 1 | 5 | 4.73 | 2.030 |
| Perceived Behavioural Ctrl 3 | 308 | 1 | 5 | 4.50 | 2.411 |
| Perceived Behavioural Ctrl 4 | 308 | 1 | 5 | 4.91 | 2.318 |
| Perceived Behavioural Ctrl 5 | 308 | 1 | 5 | 5.05 | 1.849 |
| Environmental Knowledge 1 | 308 | 1 | 5 | 4.82 | 2.149 |
| Environmental Knowledge 2 | 308 | 1 | 5 | 3.95 | 2.499 |
| Environmental Knowledge 3 | 308 | 1 | 5 | 4.59 | 2.233 |
| Environmental Knowledge 4 | 308 | 1 | 5 | 6.23 | 1.596 |
| Environmental Knowledge 5 | 308 | 1 | 5 | 4.55 | 2.314 |
| Individual Responsibility 1 | 308 | 1 | 5 | 5.50 | 2.151 |
| Individual Responsibility 2 | 308 | 1 | 5 | 4.23 | 2.238 |
| Individual Responsibility 3 | 308 | 1 | 5 | 5.77 | 1.596 |
| Individual Responsibility 4 | 308 | 1 | 5 | 5.86 | 1.844 |
| E-waste behaviour 1 | 308 | 1 | 5 | 5.86 | 1.819 |
| E-waste behaviour 2 | 308 | 1 | 5 | 6.18 | 1.030 |
| E-waste behaviour 3 | 308 | 1 | 5 | 6.32 | 1.185 |
| Valid N (listwise) | 308 | | | | |

Table 1 above contains the results of the descriptive analysis. As shown in the table majority of the items have very low standard deviation compared to their means. For instance, subjective norm item 2 has standard deviation of .942 with very high mean of 6.45. This is explained by looking at the minimum and the maximum, but this very low standard deviation relative to mean is an indication that the particular item is not a candidate for further analysis. On the general however majority of the items by their mean and standard deviation indicate that respondents are in agreement with the dimensions of our research model. Items that merit removal are revealed by the reliability analysis which is shown below.

Table 2: Reliability Statistic

| Variables | Number of Items | Cronbach's Alpha |
|----------------------------|-----------------|------------------|
| Attitude | 5 | .740 |
| Subjective Norms | 4 | .250 |
| Perceived Behavioural Ctrl | 5 | .549 |
| Environmental Knowledge | 5 | .718 |
| Individual Responsibility | 3 | .658 |
| E-wastes behaviour | 3 | .526 |

Table 2 above contains information on the reliability of the five independent variables and one dependent variable. The implication of this is that three variables: subjective norms, perceived behavioural control and the dependent variable e-waste behaviour did not pass the reliability threshold of 0.6 and were subjected to inter-item reliability analysis. This is to identify those items that need to be removed in the further analysis.

Table 3: Subjective Norms Inter-Item Reliability Analysis

| Inter-Item Covariance Matrix | | | | |
|-------------------------------------|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| | Subjective Norms 1 | Subjective Norms 2 | Subjective Norms 3 | Subjective Norms 4 |
| Subjective Norms 1 | 4.529 | .771 | -.983 | -.562 |
| Subjective Norms 2 | .771 | .887 | .261 | .278 |
| Subjective Norms 3 | -.983 | .261 | 2.753 | 1.803 |
| Subjective Norms 4 | -.562 | .278 | 1.803 | 5.441 |
| Item-Total Statistics | | | | |
| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| Subjective Norms 1 | 16.77 | 13.766 | -.098 | .510 |
| Subjective Norms 2 | 15.73 | 13.241 | .382 | .059 |
| Subjective Norms 3 | 16.45 | 11.832 | .190 | .124 |
| Subjective Norms 4 | 17.59 | 8.269 | .227 | .018 |

Two segments of results are important in the inter-item reliability analysis and these are the inter-item covariance and the item total statistics. Covariance was used here because the items were measured with the same scales. From the information in Table 3 we see that items 1 have negative covariance with items 3 and 4 while item 2 has covariance less than one. This is an indication that items one and two need be removed. This analysis is further confirmed by the inter-item total statistics which show that removing item 1 will increase Cronbach alpha from .250 to .510. Also, subjective norms item 2 has the lowest mean and very high variance and is therefore an item for expulsion. With items 1 and 2 removed the remaining items 3 and 4 four gave a Cronbach alpha of .611 and this is acceptable as it falls above the .6 benchmark.

Table 4: Perceived Behavioural Control Variable Inter-Item Reliability Analysis

| Inter-Item Covariance Matrix | | | | | | |
|-------------------------------------|---------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|--|
| | Perceived behavioural control 1 | Perceived behavioural control 2 | Perceived behavioural control 3 | Perceived behavioural control 4 | | |
| Perceived behavioural control 1 | 2.672 | .174 | -.707 | .560 | | |
| Perceived behavioural control 2 | .174 | 4.121 | 1.870 | 2.027 | | |
| Perceived behavioural control 3 | -.707 | 1.870 | 5.814 | 2.371 | | |
| Perceived behavioural control 4 | .560 | 2.027 | 2.371 | 5.373 | | |
| Item-Total Statistics | | | | | | |
| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted | |
| Perceived behavioural control 1 | 14.14 | 27.845 | .003 | .096 | .675 | |
| Perceived behavioural control 2 | 14.55 | 18.307 | .469 | .237 | .364 | |
| Perceived behavioural control 3 | 14.77 | 17.688 | .349 | .287 | .468 | |
| Perceived behavioural control 4 | 14.36 | 15.281 | .547 | .301 | .262 | |

From Table 4 above it is clear that Perceived behavioural control item 1 needed to be removed. First is that it has a covariance lower than one against all other items and particularly has a negative covariance with item 3. From the item total statistics we that this item 1 has the lowest mean but highest standard deviation and corrected total correlation is .003. It is also clear that removing this item will increase Cronbach alpha for the Perceived behavioural control variable from .549 to .675 which is above the .6 thresh hold. So, perceived behavioural control item 1 is excluded from the further analysis.

Table 5: E-waste behaviour: Inter-item Reliability Analysis

| Inter-Item Covariance Matrix | | | | | |
|-------------------------------------|----------------------------|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| | E-waste behaviour 1 | E-waste behaviour 2 | E-waste behaviour 3 | | |
| E-waste behaviour 1 | 2.548 | -.259 | .744 | | |
| E-waste behaviour 2 | -.259 | 3.402 | .118 | | |
| E-waste behaviour 3 | .744 | .118 | 3.310 | | |
| Item-Total Statistics | | | | | |
| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
| E-waste behaviour 1 | 24.23 | 12.945 | .414 | .606 | .388 |
| E-waste behaviour 2 | 24.14 | 16.261 | .039 | .090 | .651 |
| E-waste behaviour 3 | 24.14 | 12.978 | .302 | .146 | .469 |

The inter-item reliability analysis result is contained in table 5. From the inter-item reliability analysis, it is clear that items 2, 3 and 4 have inter-item covariance less than one. This is confirmed by the item-total statistics which show that removing e-waste behaviour item 2 will increase Cronbach alpha from .526 to .651 which is high. But item 3 also calls for attention as its corrected correlation and squared multiple correlations are small. Hence items 2 and 3 were removed and this increased alpha further to .828 which is very high and acceptable. In order to test the hypotheses, hierarchical multiple regressions and structural equation modeling were used. Below are the tables of the result:

Table 6: Model Summary^b

| Model | R | R Square | Adjusted Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-----------------|----------------------------|---------------|
| 1 | .373 ^a | .139 | .125 | .93562988 | 1.524 |

- a. Predictors: (Constant), Attitude, Subjective Norms, Perceived Behavioural Control, Environmental Knowledge, Individual Responsibility
- b. . Dependent Variable: E-waste behaviour

The model summary of the regression analysis showed a correlation coefficient of .373, which is a positive weak correlation. The R^2 is .139 which implies that 13.9% variation in the dependent variable (purchase behaviour) is accounted for by variation in the independent variables. The Durbin-Watson (D-W) statistic that measures multicollinearity, for this study is 1.524 and it is within the acceptance range, this confirms the absence of redundant variable(s) and therefore, no variable needed to be expunged.

Table 7 below shows the ANOVA value of 9.739, which is significant at .000. This implies that the measurement model is fit for the data. Also, because the p-value is less than .05, the model is significant.

Table 7: ANOVAa

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|-----|-------------|-------|-------------------|
| 1 Regression | 42.628 | 5 | 8.526 | 9.739 | .000 ^b |
| Residual | 264.372 | 302 | .875 | | |
| Total | 307.000 | 307 | | | |

a. Dependent Variable: e-waste behavior

b. Predictors: (Constant), Attitude, Subjective Norms, Perceived Behavioural Control, Environmental Knowledge, Individual Responsibility

The overall fit statistics for the measurement model for 30 items goodness of fit statistics is summarized in table 9 below:

TABLE 8: Goodness of Fit Statistics

| | |
|--|-------|
| Degree of Freedom (df) | 0 |
| Minimum Fit function Chi-Square χ^2 (p=0.000) | 0.000 |
| Normed chi-square (χ^2/df) | 0.000 |
| Root Mean Square Error of Approximation (RMSEA) | 0.271 |
| Normed Fit Index (NFI) | 0.000 |
| Comparative Fit Index (CFI) | 0.000 |

Values from the table 8 for the measurement model's goodness-of-fit for constructing the disposal behavior towards e-wastes is determined. The chi-square (χ^2) value is .000 which is significant at $p < .000$; this might be as a result of relatively large sample size. Normed chi-square (χ^2/df), which is the ratio of chi-square to the degree of freedom, is .000 which is below the recommended value of < 3 indicating measurement model is fit for the data. The value of RMSEA is .271 which indicates that the model has a contribution of error thus indicating less good fit model. NFI values are .000 which is below the recommended value 0.90. CFI value is 0.000 indicating the measurement model is a less good fit (Muijs,

2004 & Malviya et al., 2013). Thus, all the indicators of goodness of fit have an identified fit in the measurement model. The conclusion that can be drawn is that our measurement model is not rejected and all the indicators of goodness-of-fit are marginally accepted at best.

Tables 9 and 10 below show the beta coefficients, which give the contributions of each independent variable to the model while t-values and p-values reveal the effect of the independent variables on the dependent variable and the critical ratio and the p-values respectively. In this model, attitude ($t = - 3.524$, $p = .000 < .05$), we accept the alternative hypothesis that attitude has a significant effect on e-waste disposal behaviour. Subjective norms ($t = .504$, $p = .614 > .05$), we therefore reject the alternative hypothesis that subjective norms have a significant effect on e-waste disposal behaviour. Perceived behavioral control ($t = - 5.309$, $p = .000 < .05$), we therefore accept the alternative hypothesis that price has a significant effect on e-waste disposal behaviour.

Environmental Knowledge/Awareness ($t = .657$, $p = .512 > .05$), we therefore reject the alternative hypothesis and conclude that Environmental Knowledge/Awareness does not have a significant effect on e-waste disposal behaviour. Aesthetic value ($t = 4.417$, $p = .000 < .05$), we therefore accept the alternative hypothesis and conclude that individual responsibility has a significant effect on e-waste disposal behaviour.

Moreover, from the magnitude of t-values, individual responsibility has the highest effect, follow by attitude and perceived behavioral control in that order. The unstandardized Beta Coefficients were calculated to show the importance of a predictor in the model. The Beta value for individual responsibility (.283) indicates that individual responsibility has the strongest relationship with e-waste disposal behavior, while attitude (- .219) showed the next strongest relationship and perceived behavioural control (- .331), the third strongest relationship.

Table 9: Coefficients^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------------------------|-----------------------------|------------|---------------------------|--------|-------|
| | B | Std. Error | Beta | | |
| (Constant) | 6.166E-017 | .053 | | .000 | 1.000 |
| Attitude | -.219 | .062 | -.219 | -3.524 | .000 |
| Subjective Norms | .034 | .068 | .034 | .504 | .614 |
| Perceived Behavioral Control | -.331 | .062 | -.331 | -5.309 | .000 |
| Environmental Knowledge | .043 | .065 | .043 | .657 | .512 |
| Individual Responsibility | .283 | .064 | .283 | 4.417 | .000 |

a. Dependent Variable: E-waste disposal behavior

Table 10: Summary of Structural Equation Model

| | Hypothesized Relationship | Estimate | S.E. | C.R. | P | Conclusion |
|----------------|---|----------|------|--------|------|----------------------|
| H ₁ | E-waste Disposal Behaviour <--- Attitude | -.219 | .062 | -3.553 | *** | Supported |
| H ₂ | E-waste Disposal Behaviour <--- Subjective Norms | .034 | .067 | .509 | .611 | Not Supported |
| H ₃ | E-waste Disposal Behaviour <--- Perceived Behavioural Control | -.331 | .062 | -5.353 | *** | Supported |
| H ₄ | E-waste Disposal Behaviour <--- Environmental Knowledge | .043 | .065 | .662 | .508 | Not Supported |
| H ₅ | E-waste Disposal Behaviour <--- Individual Responsibility | .283 | .063 | 4.454 | *** | Supported |

*** p-value < 0.05, S.E = Standard Error, C.R = Critical Ratio

DISCUSSION

The study has unearthed noteworthy insights pertaining to the determinants of electronic waste disposal behavior among young adults in Uyo, Nigeria. This study empirically establishes the significance of attitude as a pivotal driver of electronic waste disposal behavior. This observation aligns harmoniously with the findings of prior research endeavors, such as the investigation conducted by Wang et al. (2019) in China, Fehegaray and Hausstein (2016) in Brazil, Botetzagias, Dima, and Malesios (2015) in Greece, Kumar (2019) in both China and India, and Twenebach-Kudoah, Adams, and Nyarku (2019). Worth noting is the international scope of these studies, spanning Asia, Europe, South America, with limited representation from Africa. This collective evidence underscores the universal salience of one's attitude toward electronic waste in shaping disposal behavior, transcending geographical boundaries.

Conversely, the investigation reveals a lack of a positive and significant association between subjective norms and electronic waste disposal behavior. This finding concurs with the scholarly work of Aboelmagod (2020) and Vijayan (2020). However, it is crucial to acknowledge the countervailing stance advocated by Priyono, Dwiwarno, and Facida (2020), Kumar (2020), and Botetzgias, Aima, and Malesios (2015), who assert that subjective norms do not emerge as a significant predictor of e-waste disposal behavior among the Greek population. The incongruity between these findings may be attributed to the varying product categories addressed by each study, signifying that the influence of subjective norms on e-waste disposal behavior is contingent upon the specific context and product categories under consideration.

Moreover, the research ascertains the positive and significant impact of perceived behavioral control on electronic waste disposal behavior, in alignment with the prior investigations by Kumar (2019), Vijayant et al. (2023), Priyono et al. (2020), and Le et al. (2013). This underscores the pivotal role of consumers' perceptions concerning the ease or difficulty associated with electronic waste disposal in predicting their behavioral tendencies.

Furthermore, the research unravels a rather contrasting outcome with regard to the influence of environmental knowledge on electronic waste disposal behavior among young adults in Uyo, Nigeria. Contrary to the assertions made by Alzubaodi et al. (2018), who posit that awareness and knowledge pertaining to the environmental ramifications of e-waste constitute a paramount concern for responsible disposal behavior, this study discerns a lack of a positive and significant effect in this regard.

The final finding of this research underscores the positive and significant role of individual responsibility in shaping electronic waste disposal behavior among the young adults in Uyo, Nigeria. This corroborates the findings articulated by Kumar (2019), emphasizing the instrumental role played by an individual's deliberate resolve to engage in responsible e-waste disposal in influencing their overall disposal behavior. Thus, it is evident that the intentional commitment to responsible disposal practices holds substantial sway over individuals' electronic waste disposal behavior.

CONCLUSION

In conclusion, the present study has contributed significantly to the understanding of the determinants of electronic waste disposal behavior among young adults in Uyo, Nigeria. Through a rigorous empirical investigation, this study has elucidated several key factors that exert varying degrees of influence on the electronic waste disposal practices of this demographic.

One of the central findings of this study is the paramount role played by individuals' attitudes in shaping their electronic waste disposal behavior. This outcome is in consonance with a body of prior research, extending across geographical boundaries and encompassing diverse cultural contexts. The collective evidence underscores the universal salience of one's attitude towards electronic waste as a pivotal driver of disposal behavior, transcending regional disparities.

Conversely, the study reveals a lack of a positive and significant association between subjective norms and electronic waste disposal behavior, aligning with the findings of certain scholarly works. However, the existence of counterarguments, particularly in the Greek context, highlights the need to consider the specific context and product categories when evaluating the influence of subjective norms on e-waste disposal behavior.

Furthermore, the study underscores the significance of perceived behavioral control in predicting electronic waste disposal behavior, substantiated by previous research efforts. The influence of consumers' perceptions regarding the ease or difficulty of e-waste disposal is pivotal, emphasizing the importance of addressing these perceptions to promote responsible disposal practices.

A notable contrast emerges in the case of environmental knowledge, where the study diverges from previous assertions regarding its role in shaping disposal behavior. While some prior research has emphasized the significance of awareness and knowledge about the environmental consequences of e-waste, this study finds no positive and significant effect on disposal behavior among young adults in Uyo, Nigeria.

Finally, the research emphasizes the salient role of individual responsibility in influencing electronic waste disposal behavior, corroborating findings from previous research. The deliberate resolve of individuals to engage in responsible e-waste disposal practices is revealed as a powerful predictor of their overall disposal behavior.

In light of these findings, this research underscores the multifaceted nature of electronic waste disposal behavior and the necessity of a nuanced, context-specific approach to promote responsible e-waste disposal among young adults. These insights offer valuable contributions to the scholarly discourse surrounding e-waste management and can inform policy and intervention strategies tailored to the unique challenges and circumstances of this demographic in Uyo, Nigeria and beyond.

Recommendations

Based on the findings of this study, several recommendations are formulated to guide future research endeavors, policy development, and interventions aimed at promoting responsible electronic waste disposal behaviour among young adults in Uyo, Nigeria and similar contexts:

1. **Promotion of Attitudinal Change:** Recognizing the pivotal role of attitude in shaping electronic waste disposal behavior, it is advisable for educational institutions, government bodies, and non-governmental organizations to implement targeted awareness campaigns that aim to foster a positive attitude towards responsible e-waste disposal. These campaigns should emphasize the environmental and social significance of proper disposal practices.
2. **Context-Specific Interventions:** Given the nuanced influence of subjective norms and their potential variability across different contexts and product categories, it is essential for policymakers and researchers to adopt a context-specific approach when designing interventions and evaluating the impact of subjective norms on e-waste disposal behavior. The development of targeted interventions that consider local factors and cultural nuances is imperative.
3. **Enhancement of Perceived Behavioral Control:** In light of the significant impact of perceived behavioral control on electronic waste disposal behavior, interventions should focus on enhancing individuals' perceived ability to engage in responsible disposal practices. This may involve improving infrastructure for e-waste collection and disposal and providing educational resources that facilitate ease and convenience in the disposal process.
4. **Reassessment of Environmental Knowledge Strategies:** Contrary to previous findings, which emphasize the role of environmental knowledge in shaping e-waste disposal behavior, this research suggests the need for a reassessment of the effectiveness of such strategies among young adults in Uyo, Nigeria. Future research should explore why environmental knowledge does not exert a significant influence and whether alternative knowledge-based approaches may be more effective.
5. **Empowering Individual Responsibility:** Given the salient role of individual responsibility, efforts should be directed towards promoting and strengthening individual commitment to responsible e-waste disposal. This can be achieved through educational programs that emphasize personal responsibility and the environmental consequences of improper disposal.
6. **Cross-Cultural Comparative Studies:** As this study has highlighted the need to consider cross-cultural differences in e-waste disposal behavior, future research could benefit from comparative studies across different regions and cultures. This

would provide a more comprehensive understanding of the impact of cultural and contextual factors on disposal behavior.

- 7. Policy Development and Implementation:** Policymakers should consider the insights from this research when formulating electronic waste management policies. These policies should be tailored to address the unique challenges and circumstances of the young adult population in Uyo, Nigeria. Regular assessments and revisions of these policies are also recommended to ensure their effectiveness.

Finally, this study underscores the multifaceted nature of electronic waste disposal behavior and the need for tailored, context-specific interventions. By incorporating these recommendations into future research and policy development, it is possible to facilitate responsible e-waste disposal practices among young adults in Uyo, Nigeria and similar demographics, thereby contributing to more sustainable and environmentally conscious communities.

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APPENDIX

E-WASTE DISPOSAL BEHAVIOUR QUESTIONNAIRE

SECTION A

Instruction: Tick (√) as Appropriate

1. **Gender:** Male Female
2. **Marital Status:** Single Married Divorced Separated
3. **Education:** FSLC O'Level OND/NCE
HND/BSc. Others
4. **Occupation:** Civil Servants Private Employee Artisan Student
Others

SECTION B - Core Questions

| | | | | |
|--------------------------|------------------|-----------------------|--------------------|-------------------------------|
| SA=Strongly Agree | A = Agree | Und= Undecided | D= Disagree | SD = Strongly disagree |
|--------------------------|------------------|-----------------------|--------------------|-------------------------------|

| S/N | ITEMS | | | | | |
|-----|---|----|---|-----|---|----|
| | ATTITUDE | SA | A | Und | D | SD |
| 5. | Proper e-waste disposal makes me feel very satisfied. | | | | | |
| 6. | Proper e-waste disposal makes a contribution to society. | | | | | |
| 7. | Proper e-waste disposal is everyone's responsibility. | | | | | |
| 8. | Proper disposal of my e-wastes is a top priority in my choice of behaviour. | | | | | |
| 9. | The advantage of proper disposal of e-wastes outweighs the disadvantages. | | | | | |

| | SUBJECTIVE NORMS | SA | A | Und | D | SD |
|-----|---|-----------|----------|------------|----------|-----------|
| 10. | My friends influence my decision of disposing my e-wastes. | | | | | |
| 11. | My co-workers influence my decision of disposing my e-wastes. | | | | | |
| 12. | My siblings influence my decision of disposing my e-wastes. | | | | | |
| 13. | Government regulations will influence me to properly dispose my e-wastes. | | | | | |
| | PERCEIVED BEHAVIORAL CONTROL | SA | A | Und | D | SD |
| 14. | I have the knowledge and ability to dispose e-wastes in my area. | | | | | |
| 15. | I have the time to dispose my e-wastes properly. | | | | | |
| 16. | I have the know-how on e-waste disposal. | | | | | |
| 17. | If I wanted to, I could dispose my e-wastes regularly. | | | | | |
| 18. | Proper e-waste disposal is very economical. | | | | | |
| | ENVIRONMENTAL KNOWLEGDE (AWARENESS) | SA | A | Und | D | SD |
| 19 | I know that proper e-waste disposal preserves natural resources for the benefit of present and future generations. | | | | | |
| 20 | I know that proper management of e-waste reduces the use of landfills and emissions of greenhouse gasses. | | | | | |
| 21 | I know that e-wastes should be disposed separately from general household wastes. | | | | | |
| 22 | E-waste can be a resource if properly managed. | | | | | |
| 23 | I know that e-waste contains toxic & hazardous substances that are harmful to human health & deteriorates the Environment. | | | | | |
| | INDIVIDUAL RESPONSIBILITY | SA | A | Und | D | SD |
| 25 | I feel personally responsible for properly disposing of electronic waste, such as old smartphones and laptops. | | | | | |
| 26 | I believe that it is my duty to ensure that electronic waste is not casually discarded but is disposed of in an environmentally responsible manner. | | | | | |
| 27 | I take personal action to reduce electronic waste by extending the lifespan of my devices or recycling them appropriately when they are no longer usable. | | | | | |
| | E-WASTE DISPOSAL BEHAVIOUR | SA | A | Und | D | SD |
| 28 | I am willing to continue disposing e-waste properly in the nearest future. | | | | | |
| 29 | I am ready to involve in proper e-waste management anytime. | | | | | |
| 30 | In the past months, I have disposed my e-wastes regularly. | | | | | |