**Constituents of Littering: Empirical Study from Staff and Students of in the Senior High Schools of Ghana**

**ABSTRACT**

Littering is considered a major environmental problem. This problem is growing steadily and is attracting great concern among the public, scholars and educational institutions. This study aimed to assess the knowledge base of students and teachers on littering in senior high schools in the Sefwi Wiawso Municipality of Ghana. The approach employs a pragmatic approach as a system of philosophy. This study adopted the convergent parallel mixed methods design. Both qualitative and quantitative were used for complementary results and comprehensive analysis. The population for this study consisted of all teaching staff and students of Sefwi Wiawso Senior High Technical School, St. Joseph Catholic Senior High School. Sefwi Wiawso Senior High Technical School. The study has a student population of nine hundred and seventeen (917) and Forty-five (45) teachers. Convenient and straightforward random techniques were used for the study's 10 teachers and 101 students. The research instruments used for the study were a questionnaire and an interview. The quantitative responses obtained from the questionnaire were coded with a numerical value and keyed into the data view of the SPSS version 23. The qualitative data was analysed through content analysis and was further transcribed into themes for analysis with a side-by-side comparison with the quantitative data. Both staff and students perceived waste as unwanted or unusable materials or any substance/material discarded after primary use. It is also concluded that littering involves the unconscious depositing of materials indiscriminately in public or private spaces. It is recommended that the senior high school management provide enough waste bins at vantage points to collect waste on compounds. It is also recommended that the school management should form waste clubs to educate and sensitise staff and students and enforce rules and regulations on littering and waste on school compounds.

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**Keywords:** Perception, Littering, Environment, Teachers, Students

1. **Introduction**

“Littering is an intrinsic constituent of today’s way of life, existing in numerous countries in the world, and it is a problem that is increasingly growing with sustained adverse effects on the health of communities, environmental quality and economic growth of the urban and rural areas” (Ojedokun &Balogun, 2011). There are many definitions of littering, but Ojedokun (2011) defines littering as an individual’s intentional or unintentional act of throwing away waste on the ground as a daily routine. It can also be defined as “a method of incorrect waste disposal” (Garg & Mashilware, 2015). “Littering was one of the first environmental problems to lend itself to systematic behavioural research, with studies dated over four decades. Public Opinion Surveys, Inc. (1968), for instance, in their article, Keep America Beautiful (KAB), reported on the attitudes, beliefs and self-reported behaviours among a large national sample. In similar studies in the United States of America, a sizable amount of research has focused on understanding and preventing litter” (Schutz, Bator, Large, Bruni & Tabanico, 2013). “India’s landscape is littered with polythene bags, which has contributed to many problems, such as choked sewers, animal death and clogged soils in the country”, according to Priya (2001). Jacobi (1995) also observed that in Sao Paulo, Brazil, a primary environmental concern is throwing waste in the streets and streamlets, leading to the proliferation of insects and rodents.

“A cursory observation in schools such as universities and secondary schools showed that many places are littered with water sachets, pieces of paper, plastics of different types and broken furniture. In hostels, there are many problems of littering, exposure to used sanitary pads, students urinating around the hostels, and students defecating in polythene bags. This poor state of sanitary conditions affects the health of students in the hostels and workers alike. Management of solid waste materials and substances like pieces of paper, packed from wrappings, tins, and wood, littering the environment and classrooms is a problem. Where attempts are made to sweep heaps of refuse are uncontrollably dumped haphazardly and mixed up together unsorted with both degradable and non-degradable materials, which mix up and cause blighting stench, harbouring mosquitoes and pests such as rats, cockroaches and eyesores” (Vivienne, 2014). “A thorough work done by researchers in junior high schools and senior high schools in some parts of the country has revealed that all students know about littering and its devastating effects. However, students litter everywhere and indiscriminately due to the unavailability of waste bins at vantage points on school compounds” (Ocansey, 2006). “If not curtailed, this condition will deteriorate the environmental quality in some schools and may impact the students' health negatively. There have been several interventions by school administrators to reduce the rate of unsanitary conditions in schools, yet students’ perception of waste disposal has not changed. Suppose appropriate efforts are not made to halt the practices in schools. In that case, they will continue to spend the more significant part of their monetary resources to ensure sound environmental sanitation without success” (Vivienne, 2014).

“The littering problem is an inherent fact of modern living that exists in one way or another in many countries, cities, and communities of the World” (Ojedokun & Balogun, 2011). Due to the modern lifestyle, environmental issues such as littering have become part of our everyday lives, including those in learning environments. It is a common practice for students or learners, as well as other school workers, to buy pre-packed items like takeaways, calculators and other disposable items and intentionally and/or unintentionally dispose of them on bare grounds in their classrooms, offices, school compound, etc., thereby, littering the environment (Matsekoleng, 2017). Improper disposal of waste materials not only clutters school grounds but also leads to other detrimental effects, such as unpleasant odours in the school environment, ultimately diminishing the overall aesthetic appeal of the premises. (Matsekoleng, 2017).

Indeed, knowledge of this and several others has prompted several studies, including what could be the reasons behind littering on school campuses, as well as ways to ameliorate the situation. Jecty, Nuamah and Arthur (2020) found a lack of waste bins, no strict measures to check littering, lack of education and littering being a common practice in Ghana as the significant reasons why people litter in three schools in the Assin North Municipality in the Central Region of Ghana. A very similar finding was found in the Greater Accra Region when students of some selected Senior High Schools were studied by Aduku (2014). The study focused on assessing *the attitude of Senior High School students towards environmental sanitation in Ghana.* In a similar setting as those in Senior High Schools in Sefwi Wiawso, Vivienne (2014), when investigating the attitude of students and staff of Asamankesse Senior High School towards environmental sanitation, also found that the unavailability of waste bins on school compounds compelled people to litter. This study aimed to assess the knowledge base of students and teachers on littering in senior high schools in the Sefwi Wiawso Municipality of Ghana. The study seeks to address these research questions: (1) What is staff and students' perception of waste? (2) What is the knowledge of what constitutes littering among staff and students of second-cycle schools in Sefwi Wiawso Municipality?

## 1.1 The Concept of Waste

Most human activities generate waste (Bruner & Rechberger, 2014). “Waste is a dynamic concept that can be defined differently” (Pongr'acz, 2009). “The Chambers dictionary defines waste as rejected, superfluous, uncultivated, unused and unproductive. The Longman Dictionary of Contemporary English also defines waste as unwanted materials or substances left after using some. Waste is any substance discarded and considered worthless, defective and of no use. The term is often subjective because waste to one person is not necessarily waste to another” (Benson et al., 2018). “Waste also refers to an item, material or substance you as an individual consider useless at a given time and place” (Mugambwa, 2009).

“Furthermore, waste is defined as residual materials resulting from human activities that cannot be reused or recovered as a resource, recycled into materials production processes, or thermally /biologically utilised for energy production” (Agwuoke, 2012). “Waste can also be defined as any product or substance with no further use or value for the person or organisation that owns it and which is or will be discarded” (Kolekra, Hazrab & Chacrabartyc, 2016). Orhorhoro and Oghoghore (2019) further defined solid waste as useless and unwanted substances in a solid state discarded by members of society.

“In generic terms, waste can be defined as the unavoidable by-product of human activity. Economic development and rising living standards have increased the quantity and complexity of generated waste” (Muzenda, 2014). “Waste is generated in various ways, and its composition and volume largely depend on consumption patterns and industrial and economic structures. Every school generates waste from routine activities such as classwork, sweeping, serving food, and bush cutting” (Adeolu, Enesi & Adeolu, 2014). The common types of solid waste found in schools in less–developed countries include paper, pure water bags, biscuits, ice cream and sweet or candy wrappers, sugar cane, maise cobs, groundnut shells, etc. Adeolu et al. (2014) and Benson et al. (2018) classified waste into three main categories: solid waste, liquid waste, and gaseous states. In this study, waste refers to solid waste. In this study, waste can operationally be defined as substances or solid objects which are disposed of or are intended to be disposed of or are required to be disposed of at an appropriate location.

## 1.1.1 Sources and Types of Solid Waste

From the definitions provided, there are different categories of solid waste. Many researchers have classified it according to its origin (such as domestic, industrial, commercial, construction or institutional) and its contents (such as organic material, glass, metal or plastic paper) or according to hazard potential (such as toxic, non-toxin, flammable, radioactive and infectious). Tchobanoglous, Theisen, and Vigil (1993). have categorised solid waste according to sources, the facilities that generate it, the types of activities that generate it, and the locations associated with the type of waste. This classification is presented in Table 1.

***Table 1: Typical waste generation facilities, activities, and locations associated with various sources of solid waste***

|  |  |  |
| --- | --- | --- |
| Source | Typical location | Types of Solid Waste |
| Residential | Single-family and multifamily dwellings, low-medium and high-rise apartments | Food waste, rubbish, ashes  and special waste |
| Commercial /municipal | Stores, restaurants, markets, office buildings, hostels, motels, print shops, medical facilities and institutions | Food wastes, rubbish, ashes, demolitions and construction wastes, special wastes, occasionally hazardous wastes. |
| Industrial | Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, lumbering, mining demolition. | Food waste, rubbish, ashes, demolition and construction wastes, special and occasionally hazardous wastes. |
| Open areas | Streets, alleys, parks and vacant plots, playgrounds, beaches, heavy and recreational areas | Special waste, rubbish |
| Treatment plant | Water, waste bins, and industrial treatment processes | Treatment plant wastes, principally composed of residual sludge |
| Agricultural | Field and row crops, orchards, vineyards, dairies, feedlots and farms | Spoiled food wastes, agricultural wastes, rubbish, hazardous wastes |

Source: Tchobanoglous, (1993)

In addition to the above waste classification, Tchobanoglous et al. (1993) also identified forms of solid waste and grouped them into food waste, rubbish, ashes and residues, and special waste. The ensuing paragraphs explain each of these forms of solid waste.

1. Food waste: Asare (2021) stated that “food wastes include all animal, plant, and vegetable residues that may result from the preparation, cooking, and eating of foods. One important feature of food wastes is that they are exceedingly perishable, and in warm weather, they decompose very quickly. Regularly, offensive odours may be developed as a result of the decomposition. The rapid decomposition nature of food waste usually influences the design and operation of solid waste collection”.
2. Rubbish: The composition of rubbish consists of combustible and non-combustible solid wastes generated from institutions, commercial activities, and households. It excludes food waste or other extremely perishing materials. Typical combustible rubbish includes plastics, paper, rubber, textiles, cardboard, wood, garden trimmings, and furniture. Also, the non-combustible rubbish comprises dirt, ferrous and non-ferrous metal, glass, tin cans, and aluminium cans.
3. Ashes and residues: Tchobanoglous et al. (1993) indicated that “ashes and residues are materials left from the burning of wood, coal, coke, and other combustible waste in industrial, institutional, and domestic settings. Burning these items includes heating, cooking, and disposing of the waste materials, and the remains after the burning process generate ashes and residues”.
4. Special waste: “The list includes roadside litter, litter from municipal containers, catch-basin debris, street sweepings, abandoned vehicles, and dead animals” (Tchobanoglous et al., 1993).

In addition to the classification of solid waste by Tchobanoglous (1993), the Centre for Environment and Development (CED) (2003) has also categorised solid waste types on three main grounds. The first is based on the source (for example, food waste, ashes and residues, rubbish, demolition and construction and agriculture waste). The second classification is based on the features of the material (biodegradable and non-biodegradable), while the third classification is based on the risk potential (hazardous waste). Additionally, the centre identified various sources of solid waste, including waste generated from residences, retail shops, commercial establishments, hotels, restaurants, food stalls, and slaughterhouses. CED classification is akin to the sources and types of categorisations by Tchobanoglous et al. (1993). On the grounds of the types of solid waste enumerated by Tchobanoglous et al. (1993) and the Centre for Environment and Development (2003), solid waste broadly includes food waste, rubbish, ashes and residues, demolition and construction, as well as agriculture waste. The sources of solid waste also include domestic, commercial and industrial.

**1.1.2 Littering in Ghana and Africa**

According to Schultz et al. (2011), “littering’ refers specifically to the human behaviour of disposing of waste improperly. Littering is a worldwide problem that has received attention in research and prevention efforts. However, littering is more common in the Middle East and Africa and receives less attention and focus” (Arafat et al., 2007). “Littering is unpleasant from the view of city cleanliness” (Green, 2001), “harmful to people and animals, and contributes to horrible odour in the environment. Litter can be any compact or fluid domestic or commercial refuse, wreckage or waste. Without limiting to the generality of the above, litter includes soft drink bottles (both plastic and metal), glass, metal, cigarette butts, small pieces of paper, chip, fabric, and confectionery wrappers, fast-food packaging, bottle covers, other bottles, plastic straws, wood, food, abandoned vehicles, abandoned vehicle parts, construction or demolition materials, garden remnants and trimmings, and soil sand or rocks generally” (Arafat, Al-Khatib, Daoud & Shwahneh, 2007). “Every school generates waste from routine activities such as classwork, sweeping, serving food, and bush cutting. Ordinary solid wastes in schools in less-developed countries include paper, grass, nylon (pure water bags and biscuits, lollypops, ice cream, sweet or candy wrappers), sugar cane, maise cobs and groundnut shells. Other forms of waste may also be found on school premises, which pupils and teachers may not have generated directly” (Adeolu et al., 2014). “Due to that, the littering of waste in urban and natural sceneries decreases the beauty and ecological value of the environment” (Crabb & Lessack, 2014). For this study, littering can be operationally defined as an individual’s intentional or unintentional throwing away solid waste in an unacceptable place.

“Globalisation has raised some troubling concerns for the developing world, including Africa. One such concern is its impact on urbanisation and the ramifications that go with it. Cities are traditionally engines of social modernisation and economic growth, and simultaneously, theatres are where globalisation stages its actions. For Africa, this has meant fuelling the already unprecedented urban growth phenomenon and increasing the challenges that go with it. One of these challenges is sanitation” (Achankeng, 2003). “Therefore, the plastic litter menace will be a double agony if environmental issues through the mass media and environmental consciousness on littering and indiscriminate waste disposal by individuals are not prioritised. For instance, in sub-Sahara Africa, the last few decades have witnessed a steady increase in the usage of plastic products, resulting in a proportionate rise in plastic waste in municipal solid waste streams in large cities” (World Bank, 1996; Yankson, 1998).

The need for a more hygienic mode of packaging food, beverages, iced water and other products brought plastic packaging to replace existing cultural packaging methods such as leaf wrappers, brown paper, and metal cups in cities and towns. Fobil, Kolawole and Hogarh (2006) believed that “the drastic change in the plastic packaging product had not been correspondingly backed by appropriate plastic waste management policy. This weakness has left many cities in Sub-Sahara Africa littered with plastic waste, thus resulting in visual nuisances and other public health problems. Most countries in Sub-Sahara Africa do not have data on waste stream composition. However, individual management authorities recognise and acknowledge the growing magnitude and prominence of plastic waste problems” (Fobil, Kolawole & Hogarh, 2006).

“In South Africa, for instance, plastic bags have been littered on the streets to such an extent that they earned the nickname ‘national flowers.’ They could be seen flapping from fences and caught in bushes” (www.wikipedia.com). “In Nigeria, urban litter is one of the most visible and persistent environmental issues facing the Oyo State Government. It costs the three tiers of government and community associations massive sums of money yearly to clean up and repair the damage it causes”. (Ojedokun & Balogun, 2011). In Tanzania, the environmental director, Mugurusi (2006), said, ‘The place has become an eyesore, plastic bags fly very easily, and their use is widespread –almost every town and city, the litter is conspicuous’. Ghana's per capita plastic waste generation is 0.016-0.035kg/person/day. Plastics comprise 8-9% of the component materials in the waste stream (Fobil, Kolawole & Hogarh, 2006). “Empirical evidence on plastic waste composition in the waste stream in Ghana shows a rising trend. Between 1996 and 1997, the proportion of plastic waste in the waste stream was 5%” (Archer, Larbi & Anim, 1997). This proportion had increased to 8% by 2000 (Worlanyo, 2013).

“In Ghana, one factor is the perception that sachet water is cleaner and more mineralised than tap water. After gulping down the liquid content, people discard the sachet bags indiscriminately, littering the whole environment. Sachet water bags appear extraordinarily high in the municipal solid waste stream, causing environmental problems such as the choking of animals and soils, blockage of waterways and rivers, the blight of landscapes and trees, and resource depletion” (Wienaah, 2007).

“The sachet bags choke the drainage systems in the country's urban centres to such an extent that it takes only the slightest rainfall to cause floods in major cities like Accra, Kumasi and Takoradi. A Daily Graphic report on (March 16, 2005) captioned, ‘The recent rains in Accra exposed the havoc being caused by plastic waste’ tells it all. For example, on March 15, 2005, Accra experienced at least two hours of rain, resulting in flooding in some city regions. A few years ago, the exact duration of rain would not have resulted in flooding” (Fobil, Kolawole & Hogarh, 2006). In the president's state of the Nation address (2009), His Excellency, the late Professor Evans John Atta Mills, announced that 21 million Ghana Cedis would be allocated to tackle sanitation in the urban communities in the country. A yearly programme, dubbed "Environmental Film Festival of Accra, 2009 ", which was produced by a Non-Governmental Organization, Creative Storm, in collaboration with UNICEF, the British Council and other international organisations, vividly tells the story in motion pictures about the menace of waste plastic bags are causing to the environment at both national and international levels (www.effaccra.org).

“Consequently, to change Ghana’s status as one of the worst-performing countries regarding sanitation issues, the government, corporate institutions, and non-governmental organisations have put forward several interventions to help promote proper waste management practices in Ghana” (Adu-Boahen, Atampugre, Antwi, & Osman, 2014). “For instance, through the Ministry of Local Government and Rural Development, the government has declared the first Saturday of every month for clean-up exercise” (Ghana News Agency, 2014). “This initiative was introduced to sensitise the citizenry about health-related benefits associated with proper waste disposal practices. In addition, the government, in its quest to reduce waste in the country, spends an average of $290 million annually distilling choked gutters and creating awareness of waste management” (Abalo, Peprah, Nyonyo, Ampomah-Sarpong, & Agyemang-Duah, 2018). “This is a worrying situation, considering that this vast expenditure on waste management deprives the country of resources that could have been directed towards other developmental programs.

Despite the aforementioned interventions, reckless littering attitudes and environmentally unfriendly practices among most Ghanaian households have dwarfed efforts to improve sanitation across the country” (Graphic Online, 2013). “There seem to be no desirable results because little or no effort has been made to understand and subsequently change the attitude or behaviour of individuals/ households towards adopting acceptable waste disposal practices. Meanwhile, improper waste disposal practices have behavioural underpinnings and, thus demand behavioural change techniques toward their prevention” (Adu-Boahen et al., 2014); “arguably, even where trash bins and containers with lids are provided people still litter the roads, stream channels, bushlands and open spaces” (Fobil, Armah, Hogarh, & Carboo, 2008) and “these practices result in environmental problems such as flooding, disease, loss of valuable materials and even death”(Puopiel, 2010). “For instance, on June 3, 2015, during a downpour, there was an explosion at a gas filling station, which cost the country the lives of 159 people and left 60 injured as a result of choked gutters due to littering and poor waste disposal behaviour” (Graphic Online, 2017). A newspaper reader commented on the sanitation problem at Mallam Atta Market, New Town, and Accra: “The refuse had heaped into rounded mounds and the gutters. The sanitation workers sweep the lorry stations in the morning. By dusk, the stations are in a mess again. Therefore, the clean-up alone, though an essential part of the solution, is somewhat of a superficial approach to solving the problem. This is akin to cutting a tree and leaving its stump in the soil. Attitudinal change is required to solve the problem” (The Daily Graphic, 2008, p.9).

1. **Materials and Methods**

The approach employs a pragmatic approach as a system of philosophy. Pragmatics believes that the existing implication of truth and the boundaries of knowledge are impermanent; thus, knowledge can be changed, modified, or altered with or without research over time (Johnson & Onwugbazie, 2004). This study adopted the convergent parallel mixed methods design, and both qualitative and quantitative methods were employed for complementary results and comprehensive analysis**.** The population for this study consisted of all teaching staff and students of Sefwi Wiawso Senior High Technical School, St. Joseph Catholic Senior High School. Sefwi Wiawso Senior High Technical School. The study has a student population of Nine Hundred and Seventeen (917) and Forty- Five (45) teachers. Convenient and straightforward random techniques were used on 10 teachers and 101 students for the study.

The teaching staff was selected using convenience sampling. The researcher used convenience sampling because getting all the teaching staff present during contact hours at the school was challenging. That was why the researcher selected staff members available in the school during data collection. This was a result of the outbreak of the COVID-19 pandemic; only teachers who had periods were present in school. The researcher interviewed the teachers who were available one after the other until the required number was obtained. Simple random sampling was adopted to select the students for the study. This technique ensures that each individual has an equal probability of being selected (Graveter & Forzano, 2009). Given this, word cards were used in the selection of students. The words' Yes' and ‘No’ were used for the selection. The number of ‘Yes’ corresponds precisely to the number of students needed in class for the study. The ‘No’ and ‘Yes’ were all put in one closed box from which students randomly picked a single card. Eventually, those who picked the ‘Yes’ were selected for the study. The research instruments used for the study were a questionnaire and an interview. The questionnaire was about the students’ perception of waste and their knowledge of the constituents of littering. The interview guide, on the other hand, was given to the teachers under the same component. The first part was teaching the staff the perception of waste. The second was based on the staff's knowledge of the constituents of littering.

The study ensured the reliability and validity of the instrument for data collection; it was given to some senior colleagues in the same field, who went through it with the researchers to review it. The suggestions led to modifying some items, while others were removed. The trustworthiness of this study was achieved through the combination of these four terms (credibility, transferability, dependability and conformability), which constitute the trustworthiness criteria, thus forming conventional pillars for qualitative methodology. The responses obtained from the questionnaire were coded with numerical values and keyed into the data view of the SPSS version 23. The qualitative data was analysed through content analysis and was further transcribed into themes for analysis with a side-by-side comparison with the quantitative data. Patton (2002) validated this process by saying that content analysis is the process of discovering themes, patterns and categories in collected data. The qualitative data gathered and presented were organised and analysed manually using emerging themes.

1. **Results and Discussions**

This section presents results and discussions on staff and students’ perceptions and knowledge of waste constituents of littering in senior high schools in the Sefwi Wiawso Municipality in the Western North of Ghana.

* 1. **Perception of Teachers on Waste**

The interview guide for the teachers started with their perception of waste. Some responses are: "*Waste is unwanted or unusable material”. “Waste is anything that no longer has a use or purpose and needs to be disposed of”.* From their responses, waste is any material that cannot be used for any other purpose. Others also described waste as spoilt and unwanted material. Hence, the term waste is relative. Thus, what one will term waste will be a resource for the other to do something. It was gathered from the interview that some waste is created, some are created by nature, and some by human activities. It was also gathered that waste is not worthless because there is always a chance for recycling; hence, with proper innovations and inventions, waste will have an economic value.

**3.2 Students’ Perceptions of Waste**

## Table 2. Analysis of students’ perception of waste

|  |  |  |
| --- | --- | --- |
| Statement | Mean | SD |
| Wastes are unwanted or unusual materials. | 3.97 | 0.40 |
| Waste is any substance /material discarded after primary use or is worthless, defective and of no use. | 3.83 | 0.36 |
| Once something is considered waste, it remains so forever. | 2.43 | 0.45 |
| Waste can never be helpful to other persons | 2.51 | 0.00 |
| A waste to someone may be helpful for other persons | 4.02 | 0.50 |
| Waste can pose a danger to our environment. | 3.77 | 0.20 |
| Any human activity generates waste | 3.65 | 0.47 |
| Males generate more waste than females | 2.76 | 0.00 |
| There could be economic value in waste | 3.67 | 0.48 |
| Poor management of waste is always an environmental problem. | 4.29 | 0.50 |
| Grand Total | **3.49** | **0.30** |

Source: Field Survey (2021)

Students' perception of waste was examined, and the result is presented in Table 2 above. The results show that most respondents (M: 4.29, SD: 0.50) accepted that poor waste management is always an environmental problem. Equally, the results show that most students (M: 4.02, SD: 0.50) affirmed that waste to someone may be helpful for other persons. Moreover, students agreed that waste is unwanted or unusable materials (M: 3.97, SD: 0.40), followed by students who accepted that waste is any substance/material which is discarded after primary use or is worthless, defective and of no use was the perception of students (M: 3.83, SD: 0.36). In addition, students accepted that waste could threaten our environment (M: 3.77, SD: 0.20) and could have an economic value (M: 3.67, SD: 0.48). Also, students believed that any human activity generates waste (M: 3.65, SD: 0.47). Regarding sex, it was realised that males generate more waste than females (M:3.05, SD: 0.00). However, this respondent could be biased since most were males.

Most respondents accepted that poor waste management is always an environmental problem and that waste to someone may be helpful for other persons. This finding agrees with Benson et al. (2018), who said that waste is often subjective because waste to one person is not necessarily a waste to another person. Moreover, students affirmed that waste is an unwanted or unusable material. Waste is any substance /material discarded after primary use or is worthless, defective and of no use. This agrees with Mugambwa (2009), in the literature review, that wastes are materials or substances considered useless and, for that matter, are unwanted. It is also in conformity with Kolekra et al. (2016). Kolekra et al. (2016) defined waste as any product or substance with no further use or value for the person or organisation that owns it and which is or will be discarded. It further agrees with Orhorhoro and Oghoghore’s (2019) definition that solid waste is a useless and unwanted substance in a solid state discarded by members of society. Waste can harm our environment, and waste could have economic value. This is in line with Ellis et al. (2005) assertion that the manufacturing use and immediate disposal of plastic bags, which are waste, have an environmental impact on society. Students from both senior high schools disagreed on the notion that once something is considered waste, it remains so forever; waste can never be helpful. This finding confirms the definition by Kolekra et al. (2016) that waste is any product or substance with no further use or value for the person or organisation that owns it and which is or will be discarded.

**3.3 Teachers’ knowledge of the constitutes of littering**

The researcher also sought the views of the teachers on what constitutes littering. It was revealed that papers, plastics, cans and sachet water plastics form a more significant part of waste in their schools. On what constitutes littering, one teacher from Sefwi Wiawso Secondary Technical School said: *“Dropping litters on the ground anyhow constitutes littering”* Another teacher from ST. Joseph Senior High School stated that *littering is intentionally depositing litter in public or private places.* The teachers clarified that littering could be prevented by putting waste bins around the school premises and punishing those who litter. It was also made clear from the interview that some teachers and students litter not because of ignorance but because of the absence of waste bins on campus.

**3.4 Students’ Knowledge of the Constituents of Littering**

## **Table 3: Analysis of students’ knowledge of the constituents of littering**

|  |  |  |
| --- | --- | --- |
| Statement | Descriptive Statistics | |
|  | **Mean** | **S.D** |
| Littering is dangerous and should not be taken for granted because it impacts the school's environment. | 2.59 | 0.967 |
| Littering can also result from construction projects on campus. | 2.51 | 0.963 |
| Littering is a crime on school campuses. | 2.49 | 0.96 |
| Littering can affect the quality of life on campus. | 2.35 | 0.95 |
| Female students litter more than male students | 2.15 | 0.93 |
| The students are the only ones who litter school campuses. | 2.01 | 0.918 |
| Littering is knowingly depositing any form of waste indiscriminately in either public or private spaces | 1.95 | 0.901 |
| The unconscious acts of depositing materials constitute littering. | 1.77 | 0.878 |
| Male students litter more than female students. | 1.64 | 0.864 |

**Grand Total 2.16 0.92**

|  |
| --- |
| Source: Field Survey (2021) |

Table 3 above shows the analysis of students’ knowledge of the constituents of littering. Littering is dangerous and should not be taken for granted because it impacts the school’s environment. It was ranked first with (SD: 2.59, M .967). In the analysis, 53 disagreed, while 89 agreed. Forty-two respondents were undecided about whether littering is dangerous and should not be taken for granted because it impacts the school environment. Littering can also result from construction projects on campus being ranked second (SD: 2.51 M .963). Littering is a crime on school campuses and ranked third (SD: 2.49: M.960), and 45 student respondents disagreed that littering can affect the quality of life on campus.

Meanwhile, 107 affirmed that littering can affect the quality of life on campus. The issue of littering being able to affect the quality of life on campus was ranked fourth (SD: 2.35: M.95). Female students litter more than male students was ranked fifth (SD: 2.15 M.93). The students are the only ones who litter on school campuses was ranked sixth with (SD: 2.01: M: .918). Littering and depositing any form of waste indiscriminately in either a public or a private space was ranked fifth (SD: 1.95, M.901). To the utter dismay of the researcher, 68 senior high school respondents disagreed that littering is knowingly depositing any form of waste indiscriminately in either a public or a private space; meanwhile, 75 of them agreed, and a whooping number of 45 indicated that they are undecided. The unconscious acts of depositing materials constitute littering was ranked eighth (SD: 1.77, M:.878), and lastly, Male students litter more than female students was ranked ninth (SD: 1.64 M .86)

Students affirmed that littering is dangerous and should not be taken for granted because it impacts the school’s environment. These findings contradict the assertion by Bonnet and William (1998) that litter is not an important environmental concern. The current findings, however, support the Environmental Protection Agency's (2002) assertion that litter is a major environmental problem today and, therefore, deserves special attention. It also supports a study conducted in Botswana by Chanda (1999), which considered littering a serious environmental problem. Others agreed that littering can affect the quality of life on campus. Littering can also result from construction projects on campus. Some students also agreed that the unconscious acts of depositing materials constitute littering. This finding supports the definition of Ojedokun (2011). In his definition, waste is an individual’s intentional or unintentional act of throwing away waste on the ground as a daily routine. Other students again agreed that littering is knowingly depositing any form of waste indiscriminately in public or private spaces and that littering is a crime on the school campus. The students were indecisive about the fact that male students litter more than female students. This finding is consistent with the conclusion by Chanda (1999), who found that gender is a poor predictor of environmental concern. However, it also contradicts that of Thrall (1996), who, in a study of middle and high school students, showed that gender and age affected the formation of positive attitudes about the environment. Students disagreed with the statement, "Students are the only ones who litter on campuses." Thus, staff and non-staff also litter around. It was understood that littering involves the unconscious act of depositing materials.

The staff of the two senior high schools perceived that waste was spoilt and unwanted material. This finding from the teachers coincides with the assertion from Orhorhoro and Oghoghore (2019) that waste is a useless and unwanted substance. Also, most teachers indicated that waste is created through human activities; this research outcome corresponds with Muzenda (2014), who posits that waste can be defined as an unavoidable by-product of human activity. It is also in conformity with Adeolu et al. (2014), who say that every school generates waste arising from routine activities by the students. However, most teachers believed that waste could be transformed or recycled into useful material; this finding gives credence to Johnson and Onwuegbuzie (2004). who said that waste becomes a resource when recycled but becomes a problem when it is not. This is also not different from Cunningham and Saigo (1997), who said that recycling reduces the volume of waste and pressure on disposal systems.

1. **Conclusions and Recommendations**

Both staff and students perceived waste as unwanted or unusable materials or any substance/material discarded after primary use. Human activities typically create them, and though staff and students have some knowledge about waste, poor management of waste always poses a problem for the environment. The study also indicated that students and teachers were aware of the devastating effects of littering, especially on their health and the environment. However, they still litter due to their poor attitude towards environmental issues. It is also concluded that littering involves the unconscious depositing of materials indiscriminately in public or private spaces. It is recommended that the senior high school management provide enough waste bins at vantage points to collect waste on compounds. It is also recommended that the school management should form waste clubs to educate and sensitise staff and students and enforce rules and regulations on littering and waste on school compounds.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during the writing or editing of this manuscript.

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