

NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF EDUCATIONAL SCIENCES
DEPARTMENT OF ENVIRONMENTAL EDUCATION AND MANAGEMENT

**ASSESSMENT OF PRO-ENVIRONMENTAL BEHAVIORS OF
SECONDARY SCHOOL STUDENTS, POLLUTION CONTROL
ATTITUDES AND KNOWLEDGE IN ABUJA, NIGERIA**

Master Thesis

John Chinenye MATTHIAS

Nicosia

June, 2021

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Approval

The thesis study of Environmental Education and Management department graduate student **Matthias John C.** with student number **20192661** titled **Assessment of Pro-Environmental Behaviors of Secondary School Students, Pollution Control Attitudes and Knowledge in Abuja, Nigeria**, has been approved with unanimity of votes by the jury established by the decision of the institute's board of directors dated and has been accepted as a Masters of Environmental Education and Management Thesis.

Thesis defense date: **28 June, 2021**

Jury members

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Confirmation:

The signature, I confirm that the name belongs to the faculty.

Director of the institute:

Prof. Dr.

Declaration

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Graduate School of Educational Sciences, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

John C. MATTHIAS

28./06/2021

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Abstract

Assessment of Pro-Environmental Behaviors of Secondary School Students, Pollution Control Attitudes and Knowledge in Abuja, Nigeria

John C. MATTHIAS

Master Thesis, Environmental Education and Management

Thesis Supervisor: Assoc. Prof. Dr. Askin KIRAZ

June 2021, 125 pages

This study assessed the level of pro-environmental behaviors, pollution control attitudes and knowledge among a sample of 424 secondary school students within Abuja the capital city of Nigeria. The data for this study was collected using three tools: environmental attitude test, environmental knowledge test and pro-environmental behavioral scale. The study data were analyzed using Ms. Excel computer program. Pearson correlation coefficient was used to compare individual responses on environmental knowledge with environmental attitude to see if both responses correlate with one another. According to the study results, the environmental attitude of the students was high, and results also showed their environmental knowledge to be also high while their pro-environmental behaviors were found to be moderate. It also reviewed that female student exhibited better pro-environmental behaviors, while the male students gave a better attitude to environmental related issues. The result displayed a very strong positive correlation value of 0.807 between environmental knowledge and environmental attitude, meaning the higher the environmental knowledge, the better their attitude towards issues of the environment and vice versa.

Keywords: **Environment**, Environmental attitudes, environmental knowledge, Pro-environmental Behaviors.

ÖZET

Assessment of Pro-Environmental Behaviors of Secondary School Students, Pollution Control Attitudes and Knowledge in Abuja, Nigeria

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Bu çalışmada, Nijerya'nın başkenti Abuja'da öğrenimlerine devam eden 424 ortaokul öğrencisinin çevre dostu davranışları, çevre kirliliğine yönelik tutumları ve çevresel bilinç düzeylerinin ölçülmesi amaçlanmıştır. Çalışmanın verileri Çevresel Tutum Testi, Çevresel Bilinç Testi ve Çevre Dostu Davranış Ölçeği ile toplanmıştır. Verilerin çözümlenmesinde Pearson korelasyon katsayısı kullanılmıştır. Araştırma sonuçlarına göre öğrencilerin çevreye karşı tutumlarının ve çevresel bilinç düzeylerinin yüksek olduğu, çevreci davranışlarının ise orta düzeyde olduğu bulunmuştur. Kız öğrencilerin daha iyi çevreci davranışlar sergiledikleri, erkek öğrencilerin ise çevre ile ilgili konularda daha iyi bir tutum sergiledikleri çalışmanın bir başka sonucudur. Çevre bilinci ile çevresel tutum arasında 0.807'lik çok güçlü bir pozitif korelasyon değeri hesaplanmıştır. Buna göre çevre bilinci ne kadar yüksekse, çevre sorunlarına karşı tutumların da o kadar iyi olduğu söylenebilir.

Anahtar Kelimeler: Çevresel tutum, çevresel bilinç, çevre dostu davranışlar

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CHAPTER I

INTRODUCTION

Statement of Problem

Over the years, there has been a steady increase in human activities around the globe, such as industrial production, resource exploitation, and private consumption on the environment which results in the degradation of the ecosystem, threats to future generations (Decamps, 2000). As a result of the increase in an environmental problem such as ozone layer depletion, the rise of sea levels, global warming, natural resource exploitation and numerous health hazards from the activities of man, society is becoming aware and more sensitive to things about the environment. Scholars all over the globe have continually called for environmental awareness to create a room in which the environment can be saved by humans from further harm.

Nigeria's capital was moved to Abuja in the year 1991 by General Babangida due to the fact that its former capital, which was Lagos state was not only congested but was also prone to attacks since it's by the sea border. Ever since Abuja was made the capital, it has been facing serious environmental problems from the consequences of rapid growth on human population from the influx of people from across the nation looking for greener pastures, urbanization, and industrialization. These consequences include wastewater disposal problems, poor air, and water quality, and a polluted environment from improper waste management and disposal practices among its inhabitants. Some of these environmental problems of waste management in developing country is as a result of no recycling policies created in their countries which contributed to the accumulation of waste and as a result caused the inability of waste

management authorities to cope with the volume of solid waste generated and at the same time caused the overstretching of waste management facilities (Nnaji, 2015).

Navaro and Vincenzo (2019), revealed in their study that more than 250,000 tons of waste is generated in Abuja per year and Abuja had only four major disposal site they manage which was shut down in the year 2005 due to poor management of the facilities which led to the contribution of air pollution and land pollution from the leachate that flowed to the surface in the rainy season period.

Nigeria as a country is facing daily increase on environmental consequences as a result of polluted environment, such problems include flooding of the environment whenever there's a heavy rainfall due to waterway blockages from the indiscriminate dumping of domestic waste into it, food contamination from the dirty environment and wrong application of fertilizers by farmers on their farmlands to improve crop production for food for the ever-increasing population of the country.

These environmental problems cannot only be solved through law enforcement by the government as to the sustainability of the environment, therefore this can also be solved by finding out the level of environmental knowledge, attitude and pro-environmental behaviors of students as this would help create a basis for more environmental education that would help them be more environmentally friendly people with positive decisions tomorrow.

Purpose of the study

This study aims at ascertaining the level of Pro-Environmental behaviors of secondary school students, and their attitudes towards controlling environmental pollution as well as their

knowledge on the consequences resulting from environmental pollution. The research will help lay the foundation for environmental awareness activities in schools and their locality.

Research questions

- 1) How is the pro-environmental behavior of the secondary students differing in respect to Gender (Boys and Girls) and Schools (Government-owned and Private Schools)?
- 2) How are the attitudes towards environment differ in respect to Gender (Boys and Girls) and Schools (Government-owned and Private Schools)?
3. What is their level of knowledge on the consequence of our actions to the environment?
4. Is there any correlation between their environmental knowledge and environmental attitudes?

Significance of the study

Since there has been an increase of environmental problems caused by the daily activities of a man to fend for his family, destroying ecosystem to erect infrastructures like railways, roads, and buildings. These problems have gotten the attention of scholars around the world and they are calling for more environmental awareness among people and this study will help in understanding the level at which the students behave pro environmentally, attitude towards the environment, and knowledge about the consequences of environmental pollution in Abuja, it'll also help to improve the attitude towards the protection and proper use of natural resources, and it would also help create room for further research.

Limitation of the study

This study interest is limited to only secondary school students of both private and government-owned within the 2020/2021 academic year calendar in Abuja.

Conceptual definitions

Environmental Education

Environmental education teaches how natural environments function, and how humans can live sustainably by managing their behaviors and the ecosystem. According to research made by Ardoin, Bower, and Gaillard (2020), environmental education also assists with advancing associations between significant examination discoveries and on-the-ground works on, making synergistic spaces where stakeholders team up to resolve dynamic ecological issues over the long run.

The components of environmental education

Awareness: Raise people's awareness of the environment and environmental challenges.

Knowledge: influence knowledge and help people better understand the environment and the environmental challenges associated with it.

Attitude: Encourage people to take an attitude of caring about the environment and the motivation to improve or maintain environmental quality.

Skills: Teach people the skills on how to identify and help resolve environmental problems when it arises.

Participation: Encourage the people to engage themselves with activities that helps in solving environmental problems (Tombul, 2006).

Pro-Environmental Behavior

Pro-environmental behavior according to a study by Steg and Vlek, (2009) is a behavior that helps reduce environmental harms and as well as protecting the environment from deteriorating. This behavior could be an intentional action that directly or indirectly benefits the environment through resource protection, conservation practices and supports the sustainable use of the natural environment (Lee, 2011).

Environmental Knowledge

Environmental knowledge according to a study by Zsoka et al (2013) means the amount of information and awareness an individual possesses about environmental problems and solutions when this problem arises. According to Ramsey and Rickson (1976), both knowledge and attitudes toward the environments were assumed to be important for changing human actions toward the environment and intelligent environmental policymaking.

Environmental Attitudes

Environmental attitudes according to Milfont & Duckitt 2010, is a physiologic tendency expressed by evaluative responses to the natural environment. While Schultz et al. (2004) described Environmental attitudes to include the beliefs, affective responses, and behavioral intentions that people hold about environment-related activities and issues. Meanwhile, Ziadat (2010), in their study, said for a better understanding of the environmental attitudes of the people under observation, one needs to examine their level of knowledge possessed about the severity of environmental problems.

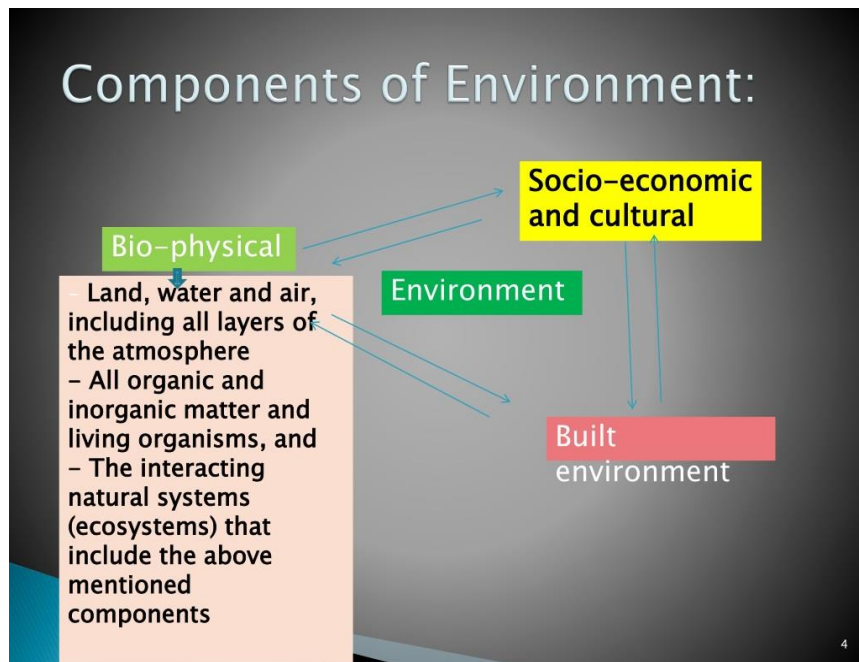
CHAPTER II

LITERATURE REVIEW

Environment

Traditionally, the term environment is defined as the entire environment including natural and biological resources. According to the definition of the World Bank (2001), environment is defined as the natural and social conditions surrounding all human beings (including future generations). Hence, the environment includes biophysical components, namely the atmosphere, hydrosphere, lithosphere, and biosphere (Bayode et al., 2011). The environment also includes the processes of inorganic and organic substances (biological and non-biological), socio-economic components, and the human environment (built environment).

According to the Canadian Environmental Protection Act (1988), the environment is the interaction between living organisms and the components of the earth, including water, air, land, all layers of the atmosphere, and organic matter.

Figure 1*Components of the environment***Braham Deo Ray, (2011) NASC.****Environmental Problems**

For many years, human beings have been facing such harsh environmental conditions, but with industrialization and urbanization, the environmental problems we believe have become more common and obvious. In most cases, industrialization and urbanization led to the aggravation of environmental problems through deforestation and environmental degradation (Sadorsky, 2013). Secondly, urbanization and industrialization increase the rate of transportation, fuel consumption and other human activities, thereby creating more environmental problems (Liu & Bae, 2018; Li et al., 2019). Solid and liquid wastes of different ingredients and concentrates are being dumped by humans indiscriminately on the environment each day, and most of these contain contaminants that are most harmful and reduces the integrity of the

environment and quality of life on the environment as well. Most of the environmental problems we are facing on the globe today are as a result of our actions toward the environment, as such constant observation and checking of this problem by us is required to know the level and fate of the environment.

Flooding

Flooding is a form of environmental problem caused mostly whenever there's heavy rainfall, and the waterways get blocked due to indiscriminate dumping of refuse into it, thereby prevent free passage of water. This eventuality not only generates a loss of properties but also generates a loss of lives, disrupts movements and way of life in a community. In most cases, the impacts of these environmental problems can be a quite wide range, from the dispersion of low-level household waste into the fluvial system to contamination of community water supplies and wildlife habitat with extremely toxic substances (Gautam and Van der hock 2003).

Wei, Guoyong Li et al. (2014), in their research examined flooding and diseases associated with floods in Henan Province of China and also found out that the incidence of dysentery increases each time there is flooding within the city and the health effects of floods increases mortality and morbidity from dysentery. According to them, this has been a major public health problem whenever there is flooding within that city.

Air Pollution

Air pollution is the presence of the harmful substance in the atmosphere that causes environmental health issues, death of living organisms, damages to the climate or material. These substances could be in form of gases, particulates, and biological molecules. According to Lave and Seskin (1970), there is a statistically significant association between several air pollutants and the incidence of bronchitis, emphysema, pneumonia, lung cancer, and other respiratory diseases as well as stomach cancer, fetal and infant death rate, and total death rate. Those most vulnerable to climate-related health effects include children, the elderly, the poor, and future generations (USEPA, 2009).

Major sources of Air pollution

There are four major types of air pollution sources of which include sources from mobiles, stationary, area, and natural sources. According to environmental protection agency (USEPA), mobile sources accounts for more than half of all the air pollution emission while stationary sources like power plants, emits large amounts of pollution from a single location and these sources are also known as a point source of pollution. Area sources of which include sources from agricultural areas, cities, and wood burning fireplaces are made up of lots of smaller pollution that aren't big deal by themselves but when considered as a group can be. And lastly, natural sources such as wind-blown dust, wildfires, and volcanoes can sometimes be significant but do not usually create ongoing air pollution problems as the other 3 sources can.

Negative effects of Air pollution on the environment

Global Warming: This issue is caused when there is a buildup of CO₂ gases and other air pollutants in the atmosphere thereby causing the earth's temperature to rise. Normally, the radiation from the sun ought to escape into space but these gases trap the heat in the atmosphere from escaping, leading to the disruptions of many interconnected systems in the environment which at some points affects human health (D'Amato and Akdis, 2020).

Climate change: Emissions of pollutants into the atmosphere can cause climate change and reduce air quality. When nitrogen oxides (NO_x) and volatile organic compounds chemically react, ground-level ozone is formed. This issue happens when air pollutants emitted by cars, oil refineries, and chemical plants react chemically in the Sun (Wang et al. 2018). Ground-level ozone in the atmosphere has a warming effect on the climate, while various components of particulate matter (PM) can either have a cooling or warming effect on the climate. Black carbon for example is a particulate pollutant that emits from the combustion of fuel and this particulate pollutant contributes to the warming of the Earth, while particulate sulfates cool the earth's atmosphere.

Acid Rain: This is another effect of air pollution, mainly caused by gases formed by human activities, including the burning of fossil fuels, nitrogen oxides, and sulfur dioxide. When these gases (pollutants) get into the atmosphere, winds sometimes spread them over miles and after which they react with, H₂O, O₂, and some other elements to form airborne sulfuric and nitric acid and then return as acid rain to the environment (Breeze, 2017). When this acid rain gets to earth,

it flows across the surface as run-off water, some empties into water systems making water bodies acidic and toxic for aquatic lives, while some sinks into the soil thereby reduces the essential nutrients of the soil, and damages physical structures like limestone buildings and cars.

Deterioration of Fields: Air Pollution in the form of ozone does cause deterioration of the field by damaging plant cells and negatively affecting photosynthesis. Also, Particulate matter in the atmosphere can reduce the amount of sunlight that reaches grasses on the field, it can as well cover their stomata when they settle on them preventing faster stomata movements leading to a decline in water-efficient gas exchange within the plant thereby negatively affecting photosynthetic processes. (Gheorghe, Ion, 2011).

Extinction of Animal Species: As a result of acid rain caused by air pollution, Animal species gradually reduce in population to the extent of going into extinction due to changes in chemistry and quality of soils and water. When these water bodies and food become too acidic for animal survivals, they gradually die off from consuming these contaminated elements, lowers their reproductive successes and if this trend continues, they gradually reduce in population to the extent of going into extinction. Changes in the abundance of any species because of this problem (air pollution) can influence another animal that depends on it for survival in a negative way. For example, the loss of fish could be detrimental to eagles and other animals that depends on fish as a source of food for their survival (Tyagi, Garg, and Paudel, 2014).

Health Problems: Air pollution has negative impacts on most of the organs and systems of the human body and it can induce and aggravate diseases like cardio cerebral vascular disease, ischemia heart disease, lung cancer, stroke, asthma and chronic obstructive pulmonary diseases (COPD). According to Myung-Jae, Jong-Hun, and Hae-Kwan (2020), exposure to harmful substances in the atmosphere reduces human mental and physical functions and is also the cause of premature deaths of 4.2 million people worldwide.

Deterioration of building Materials: Air pollution causes a lot of damages to building materials when these pollutants in the atmosphere react with water vapors to form dilute acids that go on to fall on building materials, thereby causing corrosion, discoloration, material loss, and structural failure. And the impact of these air pollution is the direct cause of economic losses in urban areas (Rao, Rajasekhar, and Rao. 2014).

Water Pollution

According to Gupta and Singh (2016), water pollution varies by type and source, and they are caused by natural and human activities. However, most cases of water pollution in the world are caused by anthropogenic activities that usually occur when substances of harmful elements from industries, discharge of domestic waste, radioactive waste, and excessive use of pesticides and fertilizers get emptied into a body of water thereby rendering it toxic for human and livestock consumption. Water is vulnerable to pollution because it's a universal solvent, dissolves more substance than any liquid found on earth (Eisenberg and Kaufmann, 1969). Organics gets decomposed naturally in the sewage by microorganisms and bacteria, this sewage finds its way

into water bodies, causing the depletion of dissolved oxygen content of the water, endangering the integrity of lakes and streams, where significant levels of oxygen are required for fish and other aquatic animals' survival (Nathanson 2020; Kern et al., 2009). According to the World Health Organization, 80% of the world's diseases are transmitted through water, and these diseases are due to water pollution mainly caused by human activities.

Pollution of water bodies as earlier stated is attributed to various pollutants and it is important to classify the pollution according to their sources of which are point sources and non-point sources.

Point sources- Point source pollution can be defined as those identifiable pollution sources that discharge pollutants into water bodies, such as ships, factories, ditches, chimneys, etc. Industries such as oil refineries, electronics, and electrical companies, automobile company, paper mills, and chemical factory are considered as common types of point sources (Hill, 1997), and unregulated discharges from these sources mentioned, results to water pollution and can as well restricts activities in the location.

Non-point sources- Most of the nonpoint source pollution occurs as a result of heavy runoffs whenever it rains, this flow of water through the ground absorbs any contaminant or substance along the path it flows. A typical example is after it rains around a parking lot or a mechanic workshop, the flow of water across the area picks up oil (petrol, diesel, or engine oil) that has spilled on the ground. A rainbow-like color is seen as this water flows across the surface of the ground on which the oil lies, and this is called nonpoint

source pollution. Nonpoint source pollution is very hard to control because these pollutants flow freely and eventually dumps into water bodies thereby causing a big threat to water bodies, causing the death of aquatic animals. Nonpoint source pollution is very hard to identify its source, unlike point source, which could be traced back to discharge pipes from factories. (Hill, et al. 1997).

Table one below shows 4 main categories of water pollution.

Table 1

categories of water pollution.

Categories	Pollutants
Pathogens	Bacteria, protozoa, or viruses
Inorganic Materials	Heavy metals (arsenic, mercury, copper, chromium, zinc, and barium)
Organic compounds	Molecules with carbon in their makeups
Material and Macroscopic pollutants	Large visible items-plastic waste, pieces of wood, shipwrecks. Metals

Soil Pollution

Soil pollution is land degradation mainly caused by improper handling of industrial activities, agricultural chemicals or general waste, whether it is municipal solid waste or agricultural waste from agricultural products. Soil pollution increases the salinity of the soil, thereby poses a worrisome threat to agricultural productivity, as well affects the food we eat, the water we drink,

the air we breathe, and the integrity of our ecosystems at large (FAO. 2 May 2018, Rome).

According to Ukaogu et.al., (2020), one of the major causes of soil pollution is a lack of awareness in general people concerning the effects of their activities towards the soil and the after-effect on their health.

Pollution of soil as discussed above are attributed to various pollutant and it is important to classify the pollution according to their types and sources.

Different type of soil pollution

Point source pollution: In this type of pollution, a specific event or a series of events in a geographic area causes soil pollution, such that the pollutant is released into the soil, and the source of that pollution is identifiable. The main source of point source pollution is human activities. These activities include uncontrolled landfills, indiscriminate disposal of waste, excessive use of fertilizers and herbicides, and oil spills from tankers. Mining activities with poor environmental standards are also the main source of heavy metal pollutants entering the soil (Lu et al. 2015).

Diffuse pollution: This type of pollution is often driven by rainfall and how land is being managed, and it involves low levels of contaminants that become lodged in the soil and acts as a sink after being spread over very wide areas, and this type of soil pollution does not usually have any identifiable source. Such contaminants are usually heavy metals or pesticides and herbicides applied on farmlands.

Sources of soil pollutants

Anthropogenic: Most of the sources of soil pollutant from which the soil gets contaminated is from the activities of man, these sources include waste from industrial activities which is the biggest contributor, agricultural activities, and municipal waste.

Natural sources: Some of the natural sources of soil pollution are earthquakes, landslides, hurricanes, and floods, though these occurs rarely unlike anthropogenic sources. These natural disasters cause severe damage to the composition of the soil thereby reducing the fertility of the soil.

Sanitization Problems in Abuja

Ezeamaka, Sadiq, Daful *et al.* (2018), revealed that refuse is usually dump on some of Abuja's road-side due to inadequate waste disposal facilities which has impacted the environment negatively, some of these impacts are the physical nuisance of the solid waste to the environment, serving as hideouts to rodents and other dangerous insects and also emit offensive odors as well. According to a report by UNICEF, Poor access to improved sanitation in Nigeria has been a major contributing factor to high mortality and morbidity rates among children of 5 years and below. Poor sanitation makes it more susceptible to water-borne diseases, including diarrhea, which kills more than 70,000 children under 5 years of age each year. Gajere *et al.* (2019) in their research revealed that one of the major causes of sanitization problems in Abuja-Nigeria is the non-payment of waste levies meant for collection and transportation of waste by residents, which results to poor revenue collected contributing to less money needed to efficiently run the services.

Environmental Education

According to the U.S. Environmental Protection Agency (USEPA), environmental education is a system organized by stakeholders in order to help people examine environmental problems, provide solutions, and take proactive measures to improve the integrity of the environment. As a result of the process taken, people become more aware of environmental issues and are also able to make more informed and responsible decisions. Environmental education does not advocate a specific perspective or strategy. On the contrary, environmental education teaches individuals how to weigh different aspects of the problem through critical thinking and improve their own problem-solving and decision-making skills.

According to Erten (2005), environmental issues are no longer solved through environmental laws or by technology nowadays, the only solution to these environmental issues is through individual behaviors and a positive attitude towards the environment, and the change of behaviors necessitate a change of attitudes, knowledge, and value judgments and all this can only be achieved only through environmental education.

Attitude towards the environment

Attitude research partly derives its relevance from the assumption that attitude is a strong predictor of behavior, and it is assumed that the more favorable an individual's attitude toward some object is, the most certain the individual will be to play out a positive behavior and the less likely the individual will be to perform any negative behavior to that object (Dekker, Dijkgraaf, and Meijerink, 2007). According to Ramsey & Rickson (1976), many environmental problems

are based on personal irresponsible environmental behavior. There is no doubt that attitude is one of the most important influences on behavior.

Environmental Knowledge

Environmental knowledge is the amount of information an individual possesses about the environment and issues and according to Arcury, (1990), there is an assumption by some researchers that increased knowledge of an individual about the environment tends to promote positive attitudes of these individuals toward their environment, and the more the person knows, the more they become interested in and concerned about their environment (Durant et al. 1989).

Pro-Environmental Behavior

According to Brown and Kasser (2005), pro-environmental behaviors are actions taken by individuals to promote environmental sustainability or possibly reduce the harm they cause to the environment to the lowest acceptable level (Steg and Vlek, 2009).

Krajihanzl (2010) defined Pro-environmental behaviors as those that are generally (or based on environmental scientific knowledge) judged as environmental protection behaviors or contributions to a healthy environment in the social context under consideration.

Related studies on Environmental knowledge, attitude, and Pro-Environmental behaviors.

Related Researches on Environmental knowledge

Haron, et al. (2005), in their research assessed the level of environmental knowledge of households in Malaysia, and also examined their sources of environmental knowledge and factors which determine different levels of environmental Knowledge acquired and analyzed the relationship between knowledge and environmental attitude, behavior and participation. The result from their study indicated a high-level of environmental knowledge and they also indicated that households' sources of environmental knowledge were from newspapers, television, and radio. And also, the factors that determine high or low level of environmental knowledge from the research they did were education, income levels of the households, and as well gender. The research also found that knowledge correlated positively with environmental attitude, behavior and participation and they also noticed that the higher the level of education, the higher the level of their environmental knowledge.

Rahman, Hossain, & Hossain (2019). In their research, investigated the environmental knowledge and green purchase behavior of energy-saving lamps of 210 consumers in Bangladesh. After examining the data collected from the respondents using a self-administered questionnaire, they went on to investigate the impact peer influence, green advertising, and environmental knowledge had on the green purchase behavior of the consumers. Results from their findings show that peer influence and green advertising have significant and positive effects on environmental knowledge, which also influences energy saving lamp users' green purchase behavior. although, consumers' environmental knowledge partly mediates the relationships

between peer influence, green advertising, and green purchase behavior of energy saving lamp users. Hence, findings from their result could also be of help to marketers and policymakers in Bangladesh in devising effective strategies so as to change consumers' regular consumption patterns and contributes to a more sustainable environment for all.

Othman, F. E., (2018) In their research, studied the impact of environmental knowledge of students of the School of Business Innovation and Technology Entrepreneurship on purchasing decisions, and discussed the relationship between eco-brands, eco-labels, and advertising on purchasing decisions. They also tried to find out the environmental knowledge factors that influence students, and their purchasing decisions, if there's any significant relationship among environmental knowledge toward purchasing decisions among the students. In order to achieve this, questionnaires were distributed to 100 students in the school to gather data for their study. Results from their findings revealed that students' environmental knowledge (eco-branding, eco-labeling, and advertising) is important for purchasing decisions.

Polonsky, Vocino, Grau, *et al.* (2012), In their research, took general environmental attitudes as the central variable in order to study the relationship between general knowledge and actions, as well as the relationship between specific knowledge and behavior on specific carbon-related issues. They collected data through an online survey, which was conducted with a random sample of American consumers through a business consumer group. After collecting and analyzing the data from the 395 respondents, results from their analysis show that overall environmental knowledge, as well as specific carbon offset knowledge, were related to attitudes,

and both general and specific behaviors were driven by their attitudes toward the environment. Their survey results show that consumers are incorporating new knowledge about the environment into their overall attitudes. Therefore, people will expect that as consumers become more and more concerned about specific environmental issues, they will in turn change their attitudes and behaviors toward the environment.

Kaplowitz and Levine (2005), examined and evaluated the levels of environmental knowledge of undergraduate, graduate, and professional students at Michigan State University (MSU), a research-intensive university located in the United States, and after which they compared those levels of environmental knowledge to that of a national sample of the adult. In order to obtain research data, they used a set of generally accepted questions to measure the level of environmental knowledge in the United States, in which nearly 20,000 students participated in the survey. The result from their analysis shows that the Demographic characteristics of the respondents compare favorably with those of the Michigan State University (MSU) student population and those at other universities, and students at Michigan State University (MSU) are statistically significantly more knowledgeable about environmental issues than the average American adult.

Liu, Teng, and Han (2020), in their study, investigated how general environmental knowledge determines environmental attitudes, behavioral intentions, and as well pro-environmental behaviors concerning the general environment, they obtained their data using questionnaires that contained information about sociodemographic, living styles, social

networks, personal cognitive ability, social security, and environmental behavior as well, which was administered to 2824 respondents in China. After obtaining the data needed for their study, they studied gender differences in concerns for the environment and also examined the relationships between the perceived severity of environmental problems. Results from their analysis showed that Environmental knowledge significantly positively affects Environmental Attitude, Environmental attitude significantly positively affects Environmental Behavioral intentions and Pro-Environmental Behavior, and Environmental Behavioral intention significantly positively affects Pro-Environmental behavior. Environmental knowledge did not have a significant direct effect on Pro-Environmental behavior. However, the indirect effects Environmental knowledge has on Pro-Environmental behavior were significant, and the influence of Environmental knowledge on Pro-Environmental behavior was mediated by Environmental attitude and Environmental behavioral intentions. They also found that females have stronger positive impacts of environmental knowledge on environmental attitudes than their male counterparts. Females are more likely to feel uneasy about environmental damage (Gambro and Switzky, 1999; Levine and Strube, 2012). Rural respondents displayed significantly more Pro-Environmental Behavior than urban respondents.

Related Researches on Environmental attitude

Tuncer, et al. (2005), in their research, examined Turkish students in grades 6-10 regarding the effect gender and school type (private and public) had on their attitudes toward the environment. To achieve this, they administered a Likert- type questionnaire consisting of 45 questions to 1496 students in order to measure their environmental attitudes. The questionnaire used to gather data for their study comprised four sections, namely, awareness of environmental

problems, awareness of individual responsibility, national environmental problems, and solutions to those problems. Results from their findings after analysis was conducted on the data they collected, show that gender, and the type of school they attend had significant effects on the collective dependent variables, and Univariate ANOVAs indicated that mean scores on each section of the questionnaire were significantly different for students in private and public-school students. Moreover, results show a statistically significant mean difference between male and female in scores on each section of the questionnaire. In conclusion, most young people living in Ankara support the conservation of the environment. Although, the result shows that there were differences between categories of people.

Hebel *et al.* (2013), Investigated 15-year-old French students' population's environmental attitudes, and also studied the student population to see if they exhibit similar environmental attitude (EA) categorization as described in the various models in the literature. Secondly, they tried identifying the different factors influencing students' environmental attitude. In order to achieve this, they employed the idea of analyzing the questionnaire-based Relevance of Science Education Project that was carried out in France in the year 2008 as part of a broader international comparative study ROSE (Relevance of Science Education). Results from their findings showed that there is a link between students' environmental attitudes and students' level of willingness to learn about certain environmental topics, and their practice of extracurricular activities linked to nature and students' value priorities in different dimensions of their future work. And results show that extra curriculum activities linked to the environment and nature tend to influence the students' environmental attitudes, and it has also increased their appreciation of nature as well. Their result also showed consistency with other environmental education studies

showing the important influence of extra curriculum activities or non-formal education activities on the development of student's environmental awareness.

Varah *et al.* (2020) in their study examined the factors influencing attitudes and behaviors of undergraduate students in Delhi about the environment (both rural and urban), determine the link between environmental attitudes and behaviors toward the environment (rural and urban), and also determined the environmental attitudes and behaviors of the students by department-wise and their district. In their results, they found out that high awareness level acquired through knowledge influences positive attitude and behaviors among the students and they also found out that the students living in rural areas showed a positive environmental attitude than those in urban areas and they also found out that students taking up life science as a subject show better attitudes toward the environment than the students studying physical science.

Robina-Ramírez & Medina-Merodio (2019), In their study, aimed at transforming students' attitudes through learning from communities committed to achieving sustainable development. In a bid to achieve this, they appointed Small organic producers, consumers, farmers, organic companies, environmental NGOs, and several environmental policymakers to interact with students both in schools and in visits to farms and companies over three years (from 2016 to 2019) about waste management, transport, energy, climate change, biodiversity, water, and citizenship. After the interaction with the students, they drafted a questionnaire according to the research meetings held in 2016 and administered them to the students to get their data for the analysis whether their “experiential learning” (EL) positively influences their “willingness to

transform their environmental attitudes” (WTEA). Results from the analysis show that communities played a vital role in students’ learning process, and their willingness to transform their environmental attitudes to protect nature now was on the positive side because their environmental awareness at schools has improved during the learning process.

Yapici, Ögenler, & Kurt *et al.* (2017) In their research, determined the environmental attitudes and perceived risks associated with environmental factors of Mersin University students in Turkey. They used cross-sectional study and they conducted their research in seven departments of the university. Their research data was collected by administering questionnaires containing environmental attitude scale and environmental risk perception scale to students. After analyzing the results from 774 students who filled the question, findings show "the release of radioactive materials associated with nuclear power generation" as the highest perceived risk, while environmental attitudes and risk perception scores were higher with students in Health Sciences faculty than in the other faculties. And also, Females were more positive toward the environment and had higher risk perceptions than their male counterparts. In general, the students had a positive attitude to the environment and had moderate-level risk perception about the environment. Finally, they suggested that environmental awareness of students should be increased, most especially those studying Social Sciences courses by revising the environmental education curriculum throughout all the faculty.

Related Researches on Pro-Environmental behaviors

Shafiei, and Maleksaeidi (2020), In their research, 310 Iranian university students were surveyed to understand what prompted them to regard environmental behavior as an important

area of concern for a sustainable environment in the future. They used the protection motivation theory as a framework for explaining pro-environmental behavior of the students, and analysis indicated that the protection motivation theory constructs along with environmental attitude are capable for explaining a significant proportion of the variance in pro-environmental behavior. Based on their results, the direct determinants of pro-environmental behavior were perceived costs of pro-environmental behavior, and perceived intrinsic and extrinsic rewards of current environmentally unfriendly behaviors, environmental attitude, self-efficacy, while pro-environmental behavior is indirectly influenced by rewards via environmental attitude and response costs.

Yusliza *et al.* (2020) Examined how pro-environmental behaviors could be influenced through the role environmental commitment, environmental consciousness, and green self-efficacy, green lifestyle played. The target population of this study was 72 students in a training center in Malaysia, and the data was collected through a survey. They use the partial least squares (PLS) method to test the hypothetical connection. Results from their findings showed that pro-environmental behavior was influenced in a positive way by being committed to the environment, having a conscious state of mind about the environment, green lifestyle and green self-efficacy, thereby providing new ideas to the existing literature on environmental sustainability. In order to promote environmental-based education by strengthening students' knowledge in Malaysia, educational institutions, Malaysian government, and private agencies would need to adopt and use the results from their findings. although, the result cannot be generalized to different settings due to the fact that they study's scope was limited to only at the training center in Malaysia. Another limitation in their study is that they used few contextual elements. What makes their study genuine and original is that it examined the role environmental

consciousness environmental commitment, and green self-efficacy, green lifestyle played as determinants of pro-environmental behavior among students in Malaysia in an educational setting.

Gatersleben, Murtagh, & Abrahamse (2012), In their paper, they studied the role of values and identity in explaining the personal environmental behavior of British residents. They achieved this by conducting a secondary analysis on data collected from three different studies on the residents, of which 2694 participated and results from their analysis show that Values and identities were good predictors of pro-environmental behavior of those residents in each study and identities explained pro-environmental behaviors more than specific attitudes. The connection between values and behavior was completely conditioned by identity in two studies, and partially conditioned in one study, supporting the idea that identity may be a broader concept that encompasses values. They proposed a fruitful future study aimed at exploring the development and maintenance of identity.

Related Local Studies on Environmental Attitude, Environmental Knowledge and Pro-Environmental Behaviors

Ogunbode and Arnold (2012), examined the distribution of environmental awareness and attitudes across socio-demographic factors in Ibadan, which is located in the southern part of Nigeria. The data for their study was collected with the help of a structured questionnaire designed to assess their knowledge and attitudes to environmental issues. Results from their findings show that older respondents were more concerned about the environment, which is

contrary to a number of findings from studies in other parts of the world according to them. Meanwhile, the youth were not as knowledgeable as the older people about environmental issues. Their result also showed that male respondents had more environmental knowledge more than their female counterparts and this was as a result of influence social cultural restrictions had on the females, but gender didn't affect other aspects of environmental attitudes. Components of social status, occupation, education, had significant effects on environmental knowledge and attitudes among the study population, whereby the respondents with tertiary education level of environmental knowledge are high compared to those with lower educational attainment. Respondents with white collar jobs had more access to environmental information and therefore had the highest level of knowledge unlike the unskilled workers.

Ibrahim and Babayemi (2010) In their study, investigated the university of Ibadan undergraduate students' knowledge and attitudes toward environmentalism. In order to achieve this, they administered a closed-ended questionnaire to 1000 students but only 927 responded to the questionnaire and was analyzed. Their survey results show that the level of environmental protection knowledge and attitudes is low, 68.75 and 54.2 respectively, which are lower than the average. The relationship between knowledge and attitudes towards environmentalism was also assessed and results showed a positive, significant and strong relationship between knowledge and attitude towards environmentalism. They went on to examine the difference in scores of knowledge and attitude towards environmentalism between subgroups of gender, religion There are significant differences in the scores of knowledge and attitude toward environmentalism between Subgroups of Gender, in which Males had significantly better knowledge of environmentalism than their female counterparts, Insignificant differences were recorded across

religion-subgroups as regards knowledge of environmentalism, although the Christians had a significantly better attitude towards environmentalism and lastly, Significant differences were recorded across field of study subgroups as regards knowledge of environmentalism.

Respondents in the field of health sciences, science and technology as well as those in humanities and arts had the best better and worse knowledge of environmentalism respectively while Insignificant differences was recorded across field of study subgroups as regards attitudes towards environmentalism. They suggested the earnest need to update undergraduates' environmental knowledge such that their attitudes may also improve.

CHAPTER III

METHODS

Study Area

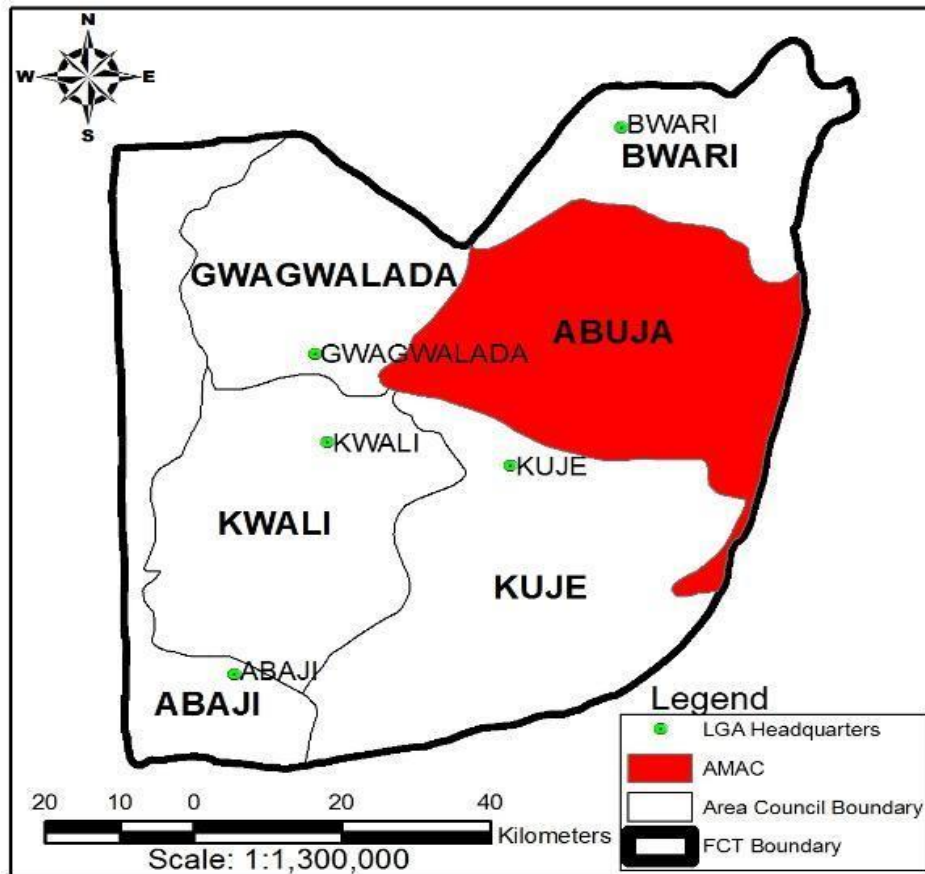
Abuja is Nigeria's administrative and political capital, located center of the country. The land area is 8,000 square kilometers, bordering Kaduna to the north, Nasarawa to the east and southeast, Niger to the west, and Kogi State to the southwest. It lies in latitude 7° 25' N and 9° 20° North of the Equator and longitude 5° 45' and 7° 39' (www.fct.gov.ng). Abuja belongs to the Guinea forest-savanna mosaic area in the West African subregion. The terrain of Abuja is gently undulating, with a height of 305m in the west and 610m in the east (Abuja-Citiserive, 2004).

Study Area Population

Abuja is composed of six municipalities, including Abaji, AMAC, Bwari, Gwagwalada, Kuje, and Kwali. These municipalities are further subdivided into districts and areas. Abuja has a population of 1, 406,239, the city's population has been growing by 20%-30% per year, making it the fastest growing city in Africa according to the National Population Commission (NPC, 2012), it is also considered to be the eight most populous cities in Nigeria. The inhabitants of Abuja are mainly people of different cultural groups who migrated from other parts of Nigeria.

Figure 2

Map of Abuja showing Abuja municipal area council



Methodology

The data for the study was collected primarily with the help of questionnaires administered to students from both private owned and government-owned schools in the six Municipals of Abuja. 400 students were initially targeted for this study but at the course of receiving the data, we noticed that 424 students responded to the questionnaire, so we made use

of the 424 respondents for the study, and Secondary data was collected from data sources like books and journals.

Scoring of the Scale and Classification

The attitudinal level towards the environment and knowledge of environmental issues of the students who participated in the study was obtained using the “five-point Likert scale” and interpreted. The scoring and grading adopted for this study is as follows.

Table 2

Scoring And Grading of The Scale Material for Environmental Attitude

Scale	Rating	Range	Value/Level
Strongly agree	5	849-1060	Very high
Agree	4	637-848	High
Neutral	3	425-636	Average
Disagree	2	213-424	Low
Strongly disagree	1	212	Very low

Table 3

Scoring And Grading of The Scale Material for Pro-Environmental Behaviors

Scale	Rating	Range	Value/Level
I do it very often	5	849-1060	Very high
I do it	4	637-848	High
I sometimes do it	3	425-636	Average
I barely do it	2	213-424	Low
I never do it	1	212	Very low

Significant difference between groups was tested using one way analysis of variance (ANOVA) to see if there is any significant difference in their response in respect to school and gender.

Data analysis

The data collected in this study was quantitatively analyzed using the computer software excel for windows, and the analysis was based on the research objectives. Reasons why we chose a quantitative method for the purpose of this research is that it is fast in obtaining information and more scientific, and we are trying to check levels and also the correlation between variable of environmental knowledge and environmental attitude scales. Quantitative method of research according to Dźwigoł (2018), is a method that is designed to determine how many people think, react, or behave in a specific way, and is also the best choice for large sample sizes.

Ethical Consideration

Informed consent was obtained from the participants before administering the questionnaires to them, and data was kept encrypted in a laptop.

CHAPTER IV

RESULTS AND DISCUSSIONS

This section consists of the study findings, tables, and interpretations of the findings.

Demographics properties

The findings based on the demographics properties of the questionnaire can be found in this section.

Table 4

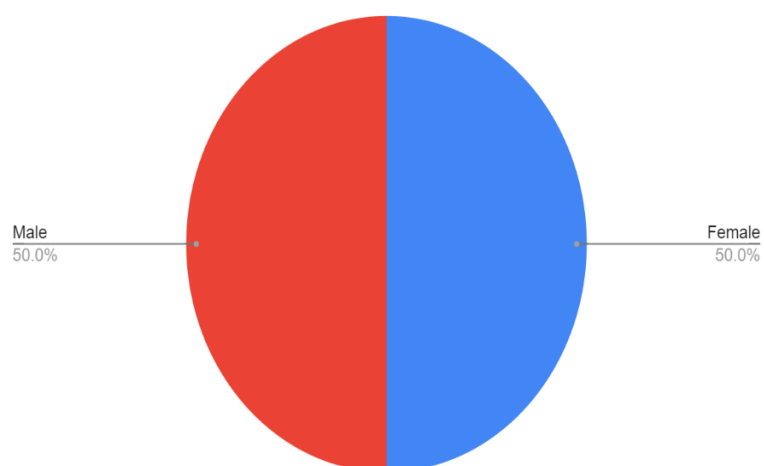
Distribution of Sample According to Gender

	Frequency (N=424)	Percentage
Female	212	50%
Male	212	50%

The table above shows that 50% of the respondents numbering about 212 were females and 50% which is about 212 were males.

Figure 3*Distribution of Sample According to Gender*

Count of Gender

**Table 5***Distribution of Sample According to Age*

Age	Frequency (N=424)	Percentage
14	78	18.4%
15	126	29.7%
16	103	24.3%
17	117	27.6%

The majority (29.7%) of the respondents were students who are 15 years of age, while students who were 16 and 17 years of age was 24.3% and 27.6% respectively and the age with the least number of respondents were students of whom were 14 years as at the time the survey was carried out.

Figure 4

Distribution of Sample According to Age

Count of Age

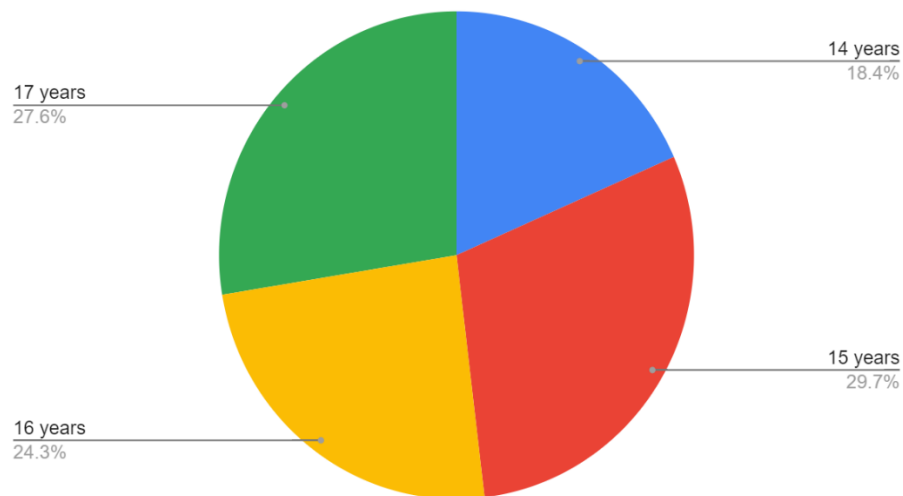


Table 6*Distribution of Sample According to school*

	Frequency (N=424)	Percentage
Government School	212	50
Private school	212	50

According to the table above, distribution of sample according to schools shows that 50% of the respondents numbering about 212 were students from government-owned schools while the remaining 50% which is about 212 were students from private schools.

Figure 5*Distribution of Sample According to school*

Count of School

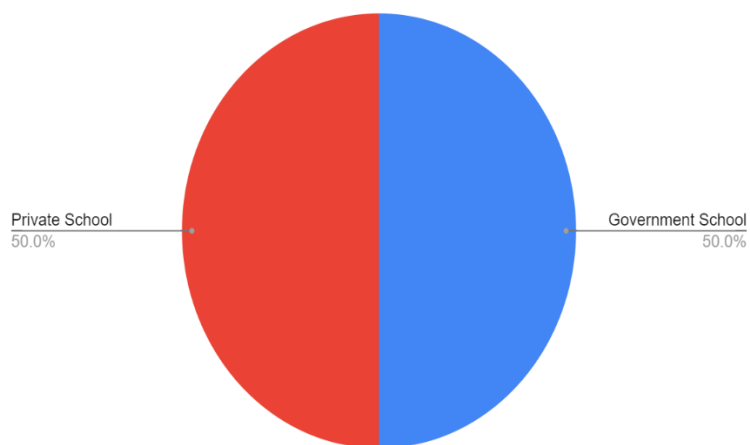
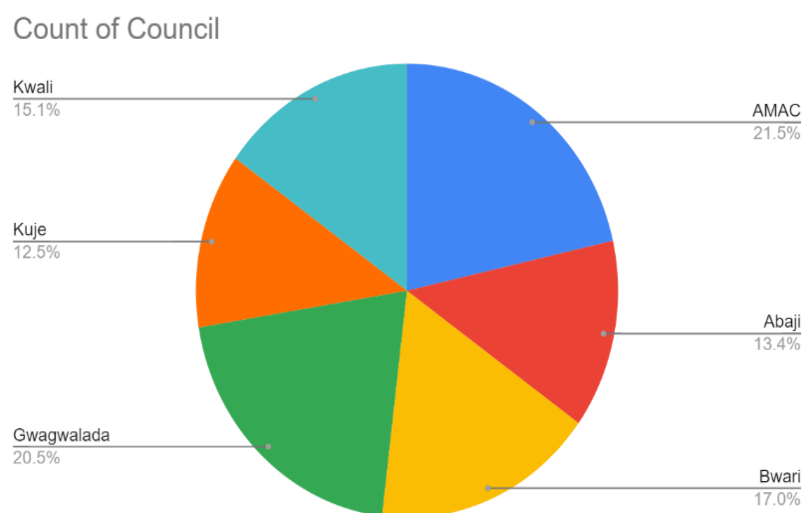


Table 7*Distribution of Sample According to Location*

Location	Frequency (N=424)	Percentage
AMAC	91	21.5%
Bwari	72	17.0%
Gwagwalada	87	20.5%
Kuje	53	12.5%
Kwali	64	15.1%
Abaji	57	13.4%

Figure 6*Distribution of Sample According to Location*

According to table 4.4 above showing distribution of sample according to locations, it shows that 21.5% of the respondents numbering about 91 were students living within AMAC, 72 students which are about 17% of the total respondents were living within Bwari, 87 students which are 20.5% of the respondents lives within Gwagwalada, 53 students live in Kuje, 64 lives in kwali and 57 lives within Abaji council.

Distribution of student's pro-environmental behavior response according to Gender (Boys and Girls)

Pro-environmental Behavioral Test

Table 8

We separate the unused papers in our house and we notify or call the place for collection.

					I do it	Total
	I never do	I barely do	I sometimes do	I do it	I do it	
Gender/Value	it (1)	it (2)	it (3)	often (4)	very often (5)	value/level
Male	71	5	100	34	2	
value/level	71	10	300	136	10	527
Female	61	46	85	10	10	
value/level	61	92	255	40	50	498

The answer from the respondents on the question “*We separate the unused papers in our house and we notify or call the place for collection*” as seen on table above shows that male students scored 527 as against their female counterparts scoring 498.

Table 9

I make sure that the book and file papers I purchased are made up of recycled paper

						Total
	I never do	I barely do	I sometimes do	I do it	I do it very	value/level
Gender/Value	it (1)	it (2)	it (3)	often (4)	often (5)	score (1060)
Male	72	68	42	27	3	
	72	136	126	108	15	457
Female	79	32	69	30	2	
	79	64	207	120	10	480

The answer from the respondents on the question “*I make sure that the book and file papers I purchased are made up of recycled paper*” as seen on table above shows that male students scored 457 as against their female counterparts scoring 480

Table 10

I normally throw away the used batteries into the garbage cans

						Total
	I never do	I barely do	I sometimes do	I do it	I do it very	value/level
Gender/Value	it (2)	it (2)	it (3)	often (4)	often (5)	score (1060)
Male	11	40	22	106	33	
	11	80	66	424	165	746
Female	10	31	70	64	37	
	10	62	210	256	185	723

The answer from the respondents on the question “*I normally throw away the used batteries into the garbage cans*” as seen on table above shows that male students scored 746 as against their female counterparts scoring 723.

Table 11

I normally throw away the used bottles into the bottle piggy bank

	I never	I barely	I sometimes	I do it	I do it very	Total
Gender/Value	do it (1)	do it (2)	do it (3)	often (4)	often (5)	value/level score (1060)
Male	46	82	20	26	38	
	46	164	60	104	190	564
Female	17	106	14	34	41	
	17	212	42	136	205	612

The answer from the respondents on the question “*I normally throw away the used bottles into the bottle piggy bank*” as seen on table above shows that male students scored 564 as against their female counterparts scoring 612.

Table 12

I and my family give our used old furniture or books to those who need or collecting institutions or organizations

	I never do	I barely do	I sometimes do	I do it	I do it very	Total
Gender/Value	it (1)	it (2)	it (3)	often (4)	often (5)	value/level score (1060)
Male	10	69	100	22	11	
	10	138	300	88	55	591
Female	57	75	59	16	5	
	57	150	177	64	25	473

The answer from the respondents on the question “*I and my family give our used old furniture or books to those who need or collecting institutions or organizations*” as seen on table above shows that male students scored 591 as against their female counterparts scoring 473.

Table 13

We are very careful about making energy saving at home or in the institution where I work. for example; keeping the electric lamp on for no reason, keeping the radio on and television on for no reason, while the heating is on, we do not want to keep the doors and window open.

	I never do	I barely do	I sometimes	I do it	I do it	Total
Gender/Value	it (1)	it (2)	do it (3)	often (4)	very often (5)	value/level score (1060)
Male	28	76	70	28	10	
	28	152	210	112	50	552
Female	32	75	61	38	6	
	32	150	183	152	30	547

The answer from the respondents on the question “*We are very careful about making energy saving at home or in the institution where I work. for example; keeping the electric lamp on for no reason, keeping the radio on and television on for no reason, while the heating is on, we do not want to keep the doors and window open*” as seen on table above shows that male students scored 552 as against their female counterparts scoring 547.

Table 14

We usually chat with friends about environmental pollution.

	I never do	I barely do	I sometimes	I do it	I do it very	Total
Gender/Value	it	it	do it	I do it often	often	value/level score (1060)
Male	27	88	81	13	2	
	27	176	243	52	10	508
Female	26	87	58	38	3	
	26	174	174	152	15	541

The answer from the respondents on the question “*We usually chat with friends about environmental pollution*” as seen on table above shows that male students scored 508 as against their female counterparts scoring 541.

Table 15

I would be very careful with unnecessary use of light, radio, and television

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	50	63	46	21	32	
	50	126	138	84	160	558
Female	43	14	59	66	30	
	43	28	177	264	150	662

The answer from the respondents on the question “*I would be very careful with unnecessary use of light, radio, and television*” as seen on table above shows that male students scored 558 as against their female counterparts scoring 662.

Table 16

I attend frequently to a conference or any meetings for the protection of the environment

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	97	86	20	2	7	
	97	172	60	8	35	372
Female	76	78	16	11	31	
	76	156	48	44	155	479

The answer from the respondents on the question “*I attend frequently to a conference or any meetings for the protection of the environment*” as seen on table above shows that male students scored 372 as against their female counterparts scoring 479.

Table 17

I write letters to newspapers or journalists, politicians, or any other authorized people for the prevention of environmental pollution.

	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	Total value/level score (1060)
Male	152	25	10	17	8	
	152	50	30	68	40	340
Female	77	89	11	34	1	
	77	178	33	136	5	429

The answer from the respondents on the question “*I write letters to newspapers or journalists, politicians, or any other authorized people for the prevention of environmental pollution*” as seen on table above shows that male students scored 340 as against their female counterparts scoring 429.

Table 18

My family and I use energy-saving light bulbs

	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	Total value/level score (1060)
Male	6	90	17	62	37	
Value	6	180	51	248	185	855
Female	20	42	31	56	63	
Value	20	84	93	224	315	736

The answer from the respondents on the question “*My family and I use energy-saving light bulbs*” as seen on table above shows that male students scored 855 as against their female counterparts scoring 736.

Table 19

I force my friends and the people around me to use biofuels for both their car and home.

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	92	19	63	29	9	
	92	38	189	116	45	480
Female	57	54	64	20	17	
	57	108	192	80	85	522

The answer from the respondents on the question “*I force my friends and the people around me to use biofuels for both their car and home*” as seen on table above shows that male students scored 480 as against their female counterparts scoring 522.

Table 20

When I buy gifts, I buy those that are organic and harmless to the environment.

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	30	47	81	14	40	
	30	94	243	56	200	623
Female	41	62	53	13	43	
	41	124	159	52	215	591

The answer from the respondents on the question “*When I buy gifts, I buy those that are organic and harmless to the environment*” as seen on table above shows that male students scored 623 as against their female counterparts scoring 591.

Table 21

To those who want to buy white appliances, I urge them to buy A class white appliance.

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	107	46	28	12	19	
	107	92	84	48	95	426
Female	41	26	134	7	4	
	41	52	402	28	20	543

The answer from the respondents on the question “*To those who want to buy white appliances, I urge them to buy A class white appliance*” as seen on table above shows that male students scored 426 as against their female counterparts scoring 543

Table 22

I and my family or group of friends use either one of our cars or public transport to protect the environment.

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	32	85	76	11	8	
	32	170	228	44	40	514
Female	50	70	57	23	12	
	50	140	171	92	60	413

The answer from the respondents on the question “*I and my family or group of friends use either one of our cars or public transport to protect the environment*” as seen on table above shows that male students scored 514 as against their female counterparts scoring 413.

Table 23

I look around for recycling bins to throw away my used papers

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	29	58	76	16	33	
	29	116	228	64	165	602
Female	61	43	35	40	33	
	61	86	105	160	165	577

The answer from the respondents on the question “*I look around for recycling bins to throw away my used papers*” as seen on table above shows that male students scored 602 as against their female counterparts scoring 577.

Table 24

My family and my friends frequently talk about the benefits and importance of alternative energy sources of wind and solar energy etc.

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	8	64	93	26	21	
	8	128	279	104	105	624
Female	23	23	104	55	7	
	23	46	312	220	35	636

The answer from the respondents on the question “*My family and my friends frequently talk about the benefits and importance of alternative energy sources of wind and solar energy etc.*” as seen on table above shows that male students scored 624 as against their female counterparts scoring 636.

Table 25

When there is a broken glass at home, we throw it into the kitchen trash disposed of along with vegetables and fruits peels.

Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	Total value/level score (1060)
Male	13	17	77	60	45	
	13	34	231	240	225	743
Female	20	13	71	33	75	
	20	26	213	132	375	766

The answer from the respondents on the question “*When there is a broken glass at home, we throw it into the kitchen trash disposed of along with vegetables and fruits peels*” as seen on table above shows that male students scored 743 as against their female counterparts scoring 766.

Table 26

I follow the internet, television, newspapers for news of the use and expansion of alternative energy sources.

Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	Total value/level score (1060)
Male	12	20	140	32	8	
	12	40	420	128	40	640
Female	25	67	90	20	10	
	25	134	270	80	50	559

The answer from the respondents on the question “*I follow the internet, television, newspapers for news of the use and expansion of alternative energy sources*” as seen on table above shows that male students scored 640 as against their female counterparts scoring 559.

Table 27

Me and friends wash fruits and vegetables in a bowl in the kitchen.

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	5	9	90	60	48	
	5	18	270	240	240	773
Female	3	15	67	56	71	
	3	30	201	224	355	813

The answer from the respondents on the question “*Me and friends wash fruits and vegetables in a bowl in the kitchen*” as seen on table above shows that male students scored 773 as against their female counterparts scoring 813.

Table 28

I and my friends save the water we use for washing fruits to reuse it for toilets and bathroom cleanliness or for watering plants

						Total
Gender/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Male	26	18	66	93	9	
	26	36	198	372	45	677
Female	52	22	50	70	18	
	52	44	150	280	90	616

The answer from the respondents on the question “*I and my friends save the water we use for washing fruits to reuse it for toilets and bathroom cleanliness or for watering plants*” as seen on table above shows that male students scored 677 as against their female counterparts scoring 616.

Distribution of student’s pro-environmental behavior response according to Schools (Government-owned and Private Schools).

Table 29

We separate the unused papers in our house and we notify or call the place for collection.

						Total value/level
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	score (1060)
Private School	50	22	104	27	9	
	50	44	312	108	45	559
Government School	82	29	81	17	3	
	82	58	243	68	15	466

The answer from the respondents on the question “*We separate the unused papers in our house and we notify or call the place for collection*” as seen on table above shows that students from private schools scored 559 as against students from Government schools who scored 466.

Table 30

I make sure that the book and file papers I purchased is made up from recycled paper.

						Total
School/Value	I never do it	I barely do it	sometimes I do it	I do it often	I do it very often	value/level score (1060)
Private School	62	79	50	18	3	
	62	158	150	72	15	457
Government School	89	21	61	39	2	
	89	42	183	156	10	480

The answer from the respondents on the question “*I make sure that the book and file papers I purchased is made up from recycled paper*” as seen on table above shows that students from private schools scored 457 as against students from Government schools who scored 480.

Table 31

I normally throw away the used batteries into the garbage cans

						Total
School/Value	I never do it	I barely do it	sometimes I do it	I do it often	I do it very often	value/level score (1060)
Private School	17	50	23	100	22	
	17	100	69	400	110	696
Government School	4	21	69	70	48	
	4	42	207	280	240	773

The answer from the respondents on the question “I normally throw away the used batteries into the garbage cans” as seen on table above shows that students from private schools scored 696 as against students from Government schools who scored 773.

Table 32

I normally throw away the used bottles into the bottle piggy bank

						Total
School/Value	I never do it	I barely do it	sometimes I do it	I do it often	I do it very often	value/level score (1060)
Private School	43	79	18	19	53	
	43	158	54	76	265	596
Government						
School	20	109	16	41	26	
	20	218	48	164	130	580

The answer from the respondents on the question “*I normally throw away the used bottles into the bottle piggy bank*” as seen on table above shows that students from private schools scored 596 as against students from Government schools who scored 580.

Table 33

Me and my family give our used old furniture or books to those who need or collecting institutions or organizations

						Total
School/Value	I never do it	I barely do it	sometimes I do it	I do it often	I do it very often	value/level score (1060)
Private School	21	82	85	13	11	
	21	164	255	52	55	547
Government						
School	46	62	74	25	5	
	46	124	222	100	25	517

The answer from the respondents on the question “*Me and my family give our used old furniture or books to those who need or collecting institutions or organizations*” as seen on table above shows that students from private schools scored 547 as against students from Government schools who scored 517.

Table 34

We are very careful about making energy saving at home or in the institution where I work. for example; keeping the electric lamp on for no reason, keeping the radio on and television on for no reason, while the heating is on, we do not want to keep the doors and window open.

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	44	66	60	31	11	
	44	132	180	124	55	535
Government						
School	16	85	71	35	5	
	16	170	213	140	25	564

The answer from the respondents on the question “*We are very careful about making energy saving at home or in the institution where I work. for example; keeping the electric lamp on for no reason, keeping the radio on and television on for no reason, while the heating is on, we do not want to keep the doors and window open*” as seen on table above shows that students from private schools scored 535 as against students from Government schools who scored 564.

Table 35

We usually chat with friends over environmental pollution

	I never	I barely	I sometimes	I do it	I do it very	Total
School/Value	do it	do it	do it	often	often	value/level
Private School	39	75	71	25	2	512
	39	150	213	100	10	
Government						
School	15	100	68	26	3	538
	15	200	204	104	15	

The answer from the respondents on the question “*We usually chat with friends over environmental pollution*” as seen on table above shows that students from private schools scored 512 as against students from Government schools who scored 538

Table 36

I would be very careful for unnecessary use of light, radio and television.

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	30	54	40	43	45	
	30	108	120	172	225	655
Government						
School	63	23	65	44	17	
	63	46	195	176	85	565

The answer from the respondents on the question “*I would be very careful for unnecessary use of light, radio and television*” as seen on table above shows that students from private schools scored 655 as against students from Government schools who scored 565.

Table 37

I attend frequently to conference or any meetings for protection of the environment

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	68	103	13	9	19	
	68	206	39	39	95	447
Government						
School	105	61	23	4	19	
	105	122	69	16	95	407

The answer from the respondents on the question “*I attend frequently to conference or any meetings for protection of the environment*” as seen on table above shows that students from private schools scored 447 as against students from Government schools who scored 407.

Table 38

I write letters to newspapers or journalists, politicians or any other authorized people for the prevention of environmental pollution.

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	112	62	16	19	3	
	112	124	48	76	15	375
Government						
School	117	52	5	32	6	
	117	104	15	128	30	394

The answer from the respondents on the question “*I write letters to newspapers or journalists, politicians or any other authorized people for the prevention of environmental pollution*” as seen on table above shows that students from private schools scored 375 as against students from Government schools who scored 394.

Table 39*My family and I use energy saving light bulbs*

	I never	I barely	I sometimes	I do it	I do it very	Total
School/Value	do it	do it	do it	often	often	value/level score (1060)
Private School	8	54	29	72	49	
	8	108	87	288	245	736
Government						
School	18	78	19	46	51	
	18	156	57	184	255	670

The answer from the respondents on the question “*My family and I use energy saving light bulbs*” as seen on table above shows that students from private schools scored 736 as against students from Government schools who scored 670.

Table 40*I force my friends and the people around me to use biofuels for both their car and home.*

	I never	I barely	I sometimes	I do it	I do it very	Total
School/Value	do it	do it	do it	often	often	value/level score (1060)
Private School	88	48	49	18	9	
	88	96	147	72	45	448
Government						
School	61	25	78	31	17	
	61	50	234	124	85	554

The answer from the respondents on the question “*I force my friends and the people around me to use biofuels for both their car and home*” as seen on table above shows that students from private schools scored 448 as against students from Government schools who scored 554.

Table 41

When I buy gifts that are organic and harmless to the environment.

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	36	47	54	16	59	
	36	94	162	64	295	651
Government						
School	35	62	80	11	24	
	35	124	240	44	120	563

The answer from the respondents on the question “*When I buy gifts that are organic and harmless to the environment*” as seen on table above shows that students from private schools scored 651 as against students from Government schools who scored 563.

Table 42

To those who want to buy white appliances, I urge them to buy A class white appliance

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	77	36	72	10	17	
	77	72	216	40	85	490
Government						
School	71	36	90	9	6	
	71	72	270	36	30	479

The answer from the respondents on the question “*To those who want to buy white appliances, I urge them to buy A class white appliance*” as seen on table above shows that students from private schools scored 490 as against students from Government schools who scored 479.

Table 43

Me and my family or group of friends use either one of our cars or public transport to protect the environment.

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	51	74	63	9	15	
	51	148	189	36	75	499
Government						
School	31	81	70	25	5	
	31	162	210	100	25	528

The answer from the respondents on the question “*Me and my family or group of friends use either one of our cars or public transport to protect the environment*” as seen on table above shows that students from private schools scored 469 as against students from Government schools who scored 528.

Table 44

I look around for recycling bins to throw away my used papers

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	23	47	61	36	45	
	23	94	183	144	225	669
Government School	67	54	50	20	21	
	67	108	150	80	105	510

The answer from the respondents on the question “*I look around for recycling bins to throw away my used papers*” as seen on table above shows that students from private schools scored 669 as against students from Government schools who scored 510.

Table 45

My family and my friends frequently talk about the benefits and importance of alternative energy sources of wind and solar energy etc.

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	16	59	84	39	14	
	16	118	252	156	70	612
Government						
School	15	28	113	42	14	
	15	56	339	168	70	648

The answer from the respondents on the question “*My family and my friends frequently talk about the benefits and importance of alternative energy sources of wind and solar energy etc.*” as seen on table above shows that students from private schools scored 612 as against students from Government schools who scored 648.

Table 46

When there is a broken glass at home, we throw it into the kitchen trash disposed of along with vegetables and fruits peels

					I do it very often	Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often		value/level score (1060)
Private School	20	25	93	24	50	
	20	50	279	96	250	695
Government						
School	13	5	55	69	70	
	13	10	165	276	350	814

The answer from the respondents on the question “*When there is a broken glass at home, we throw it into the kitchen trash disposed of along with vegetables and fruits peels*” as seen on table above shows that students from private schools scored 695 as against students from Government schools who scored 814.

Table 47

I follow the internet, television, newspapers for news of the use and expansion of alternative energy sources

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	8	53	124	17	10	
	8	106	372	68	50	604
Government						
School	29	34	106	35	8	
	29	68	318	140	40	595

The answer from the respondents on the question “*I follow the internet, television, newspapers for news of the use and expansion of alternative energy sources*” as seen on table above shows that students from private schools scored 604 as against students from Government schools who scored 595.

Table 48*Me and family wash fruits and vegetables in a bowl in the kitchen*

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	3	9	69	46	85	
	3	18	207	184	425	838
Government						
School	5	15	88	70	34	
	5	30	264	280	170	749

The answer from the respondents on the question “*Me and family wash fruits and vegetables in a bowl in the kitchen*” as seen on table above shows that students from private schools scored 838 as against students from Government schools who scored 749.

Table 49*I and my family save the water we use for washing fruits to reuse it for toilets and bathroom cleanliness or for watering plants.*

						Total
School/Value	I never do it	I barely do it	I sometimes do it	I do it often	I do it very often	value/level score (1060)
Private School	49	11	68	70	14	
	49	22	204	280	70	625
Government						
School	29	29	48	93	13	
	29	58	144	372	65	668

The answer from the respondents on the question “*I and my family save the water we use for washing fruits to reuse it for toilets and bathroom cleanliness or for watering plants*” as seen on table above shows that students from private schools scored 625 as against students from Government schools who scored 668.

Distribution of Students’ Responses for Environmental Attitude Scale According to Gender and According to School

Table 50

I think that liquid gas for residential and commercial use is a contribution to the solution of the air pollution problem

Variable	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total value/level score (1060)
Male	70	45	16	80	1	
value/level	350	180	48	160	1	739
Female	81	37	53	34	7	
value/level	405	148	159	68	7	787
Private School	45	68	29	64	6	
value/level	225	272	87	128	6	718
Government School	106	14	40	50	2	
value/level	530	56	120	100	2	808

Looking at the answers given for “*I think that liquid gas for residential and commercial use is a contribution to the solution of the air pollution problem*” on the table above, we will see that the female students level score was 787 while that of the lesser was for the male students scoring 739. Meanwhile, Government school students level score was 806 while that of the lesser value was for the private school students scoring 718.

Table 51

Thinning the ozone layer threatens all people

Gender/Value	Strongly Agree		Neutral	Disagree	Strongly disagree		Total value/level score (1060)
	Agree	Agree			disagree	disagree	
Male	113	57	6	12	24		
value/level	565	285	18	24	24		916
Female	132	24	42	6	8		
value/level	660	96	126	12	8		902
Private	98	71	13	15	15		
value/level	490	284	39	30	15		858
Government	147	10	35	3	17		
value/level	735	40	105	6	17		903

Looking at the answers given for “*Thinning the ozone layer threatens all people*” on the table above, we will see that the Male students level score was 916 while that of the lesser was for the Female students scoring 902. Meanwhile, students from Government School scored 903 while that of the lesser was for students who attends Private School having 858 as their score.

Table 52

To participate in activities related to environmental contamination is a social responsibility

	Strongly			Strongly		Total value/level
Gender/Value	Agree	Agree	Neutral	Disagree	disagree	
Male	69	111	4	11	17	
value/level	345	444	12	22	17	840
Female	43	102	7	35	25	
value/level	215	408	21	70	25	739
Private	65	99	6	23	19	
value/level	325	396	18	46	19	804
Government	47	114	5	23	23	
value/level	235	576	15	46	23	895

Looking at the answers given for “*To participate in activities related to environmental contamination is a social responsibility*” on the table above, we will see that male students scored 840 while that of the lesser was for Female students scoring 739. Meanwhile, students from Government schools scored 895 while that of the lesser was for Private School students scoring 804.

Table 53

It is not exaggerated news that the sea river and soil is polluted.

Variable	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total value/level score (1060)
Male	57	7	61	79	8	
value/level	285	28	183	158	8	662
Female	38	86	35	42	11	
value/level	190	344	105	84	11	734
Private	51	41	49	56	15	
value/level	255	164	147	112	15	693
Government	44	52	47	65	4	
value/level	220	208	141	130	4	703

Looking at the answers given for “*It is not exaggerated news that the sea river and soil is polluted*” on the table above, we will see that male students scored 662 which is lesser compared to Female students scoring 734. Meanwhile, Students from Government schools scored 703 while Students from Private school scored 693.

Table 54

Drinking water in big cities is dirty enough to require the house to use water filters

	Strongly			Strongly		Total value/level score (1060)
Gender/Value	Agree	Agree	Neutral	Disagree	disagree	
Male	11	82	76	25	18	
value/level	55	328	228	50	18	679
Female	52	83	36	25	16	
value/level	260	332	108	50	16	766
Private	15	34	65	77	21	
value/level	75	136	195	154	21	681
Government	19	16	47	88	42	
value/level	95	48	141	176	42	460

Looking at the answers given for “*Drinking water in big cities is dirty enough to require the house to use water filters*” on the table above, we will see that male students scored 679 while the female students scored 766. Meanwhile, Students from Private Schools scored 681 while Government School students scored 460.

Table 55

Efforts to protect sea turtles in some cities are seen as a waste of time.

	Strongly				Strongly	Total value/level score (1060)
Gender/Value	Agree	Agree	Neutral	Disagree	disagree	
Male	10	84	61	41	16	
value/level	50	336	183	82	16	667
Female	33	62	78	26	13	
value/level	165	248	234	52	13	712
Private	19	96	72	17	8	
value/level	95	384	216	34	8	737
Government	24	50	67	50	21	
value/level	120	200	201	100	21	642

Looking at the answers given for “*Efforts to protect sea turtles in some cities are seen as a waste of time*” on the table above, we will see that male students scored 667 while female students scored 712. Meanwhile, Students from private school scored 737 while government school students scored 642.

Table 56

Mediterranean climate zone has no problem of desertification.

Variable	Strongly				Strongly	Total value/level
	Agree	Agree	Neutral	Disagree	disagree	
Male	11	64	57	34	46	
value/level	55	256	171	68	46	596
Female	24	25	79	34	50	
value/level	120	100	237	68	50	575
Private	19	62	64	46	21	
value/level	95	248	192	92	21	648
Government	16	27	72	22	75	
value/level	80	108	216	44	75	523

Looking at the answers given for “*Mediterranean climate zone has no problem of desertification*” on the table above, we will see that male students scored 596 while female students scored 575. Meanwhile Students from Private School scored 648 while students from the Government School scored 523.

Table 57

In order to meet the needs of people that need fresh air, it should be encouraged to make small houses located near the wooded area of the city.

Gender/Value	Strongly Agree		Neutral	Disagree	Strongly disagree		Total value/level Score (1060)
	Agree	Agree			disagree	disagree	
Male	8	76	83	32	13		
value/level	40	304	249	64	13		670
Female	2	34	96	29	51		
value/level	10	136	288	58	51		543
Private	7	73	66	45	21		
value/level	35	292	198	90	21		636
Government	3	37	113	16	43		
value/level	15	148	339	32	43		577

Looking at the answers given for “*In order to meet the needs of people that need fresh air, it should be encouraged to make small houses located near the wooded area of the city*” on the table above, we will see that male students scored 670 while female students scored 543.

Meanwhile, Private School Students scored 636 while students from Government Schools scored 577.

Table 58

Air, water, and soil are inexhaustible sources.

	Strongly				Strongly	Total value/level score (1060)
Gender/Value	Agree	Agree	Neutral	Disagree	disagree	
Male	76	99	5	10	22	
value/level	380	396	15	20	22	833
Female	120	39	5	41	7	
value/level	600	156	15	82	7	860
Private	71	97	7	27	10	
value/level	355	388	21	54	10	828
Government	125	41	3	24	19	
value/level	625	164	9	48	19	865

Looking at the answers given for “*Air, water, and soil are inexhaustible sources*” on the table above, we will see that male students scored 833 while female students scored 860. Meanwhile, Students from Private School Scored 828 while students from Government school scored 865.

Table 59

No matter which country does the nuclear test, it should be protested.

	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total value/level score
Male	49	122	19	6	16	
value/level	245	488	57	12	16	818
Female	64	79	10	33	26	
value/level	320	316	30	66	26	758
Private	36	134	20	14	8	
value/level	180	536	60	28	8	812
Government	77	67	9	25	34	
value/level	385	268	27	50	34	764

Looking at the answers given for “No matter which country does the nuclear test, it should be protested” on the table above, we will see that male students scored 818 while female students scored 758. Meanwhile, Students from Private Schools scored 812 while students from Government Schools scored 764.

Table 60*Rapid population growth is a serious problem.*

Gender/Value	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total value/level score
Male	14	32	90	11	65	
value/level	70	128	270	22	65	555
Female	49	25	59	35	44	
value/level	245	100	177	70	44	636
Private	21	44	55	14	78	
value/level	105	176	165	28	78	552
Government	42	13	94	32	31	
value/level	210	52	282	64	31	639

Looking at the answers given for “*Rapid population growth is a serious problem*” on the table above, we will see that male students scored 555 while female students scored 636. Meanwhile, students from Private school scored 552 while students from Government School scored 639.

Table 61*People who throw garbage or spit on the floor should be intervened*

	Strongly				Strongly	Total
Gender/Value	Agree	Agree	Neutral	Disagree	disagree	value/level score
Male	40	135	14	9	14	
value/level	200	528	42	18	14	802
Female	73	91	12	5	31	
value/level	365	364	36	10	31	806
Private	60	116	16	11	9	
value/level	300	464	48	22	9	843
Government	53	110	10	3	36	
value/level	265	440	30	6	36	777

Looking at the answers given for “*People who throw garbage or spit on the floor should be intervened*” on the table above, we will see that male students scored 802 while female students scored 806. Meanwhile, students from Private Schools scored 843 while students from Government Schools scored 777.

Table 62*Unplanned construction is an environmental problem*

	Strongly			Disagree	Strongly	Total
Gender/Value	Agree (5)	Agree (4)	Neutral (3)	(2)	disagree (1)	value/level score
Male	41	100	47	13	11	
value/level	205	400	141	26	11	783
Female	98	47	43	7	17	
value/level	490	188	129	14	17	838
Private	70	85	32	17	8	
value/level	350	340	96	34	8	828
Government	69	62	58	3	20	
value/level	345	248	174	6	20	793

Looking at the answers given for “*unplanned construction is an environmental problem*” on the table above, we will see that male students scored 783 while students from government schools scored 838. Meanwhile, Private School students scored 828 and students from Government Schools scored 793.

Table 63

The idea of environmental protection to prevent the development of developing countries is made up by westerners

	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)	Total value/level score
Male	9	31	117	9	46	
value/level	45	124	351	18	46	584
Female	6	33	107	21	45	
value/level	30	165	321	42	45	603
Private	8	52	90	13	49	
value/level	40	208	270	26	49	593
Government	7	12	134	17	42	
value/level	35	48	402	34	42	561

Looking at the answers given for “*The idea of environmental protection to prevent the development of developing countries is made up by westerners*” on the table above, we will see that male students scored 584 while the female students scored 603. Meanwhile, students from private schools scored 593 while that of government school students was 561.

Table 64

Being sensitive to environmental issues does not prevent the development of a country.

Gender/Value	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)	Total value/level score
Male	38	98	49	14	13	
value/level	190	392	147	28	13	770
Female	61	107	24	15	5	
value/level	305	428	72	30	5	840
Private	51	103	31	22	5	
value/level	255	412	93	44	5	809
Government	48	102	42	7	13	
value/level	240	408	126	14	13	801

Looking at the answers given for “*Being sensitive to environmental issues does not prevent the development of a country*” on the table above, we will see that males scored 770 while that of female students was 840. Meanwhile, private school students scored 809 while that of government school students was 801.

Table 65

The emergence of environmental groups rather than protecting the environment stem from the need to make friends

	Strongly				Strongly	Total
Gender/Value	Agree (5)	Agree	Neutral	Disagree	disagree	value/level score
Male	6	85	71	35	15	
value/level	30	340	213	70	15	668
Female	39	56	86	27	4	
value/level	195	224	258	54	4	735
Private	14	47	99	46	6	
value/level	70	188	297	92	6	653
Government	31	94	58	16	13	
value/level	155	376	174	32	13	750

Looking at the answers given for “*The emergence of environmental groups rather than protecting the environment stem from the need to make friends*” on the table above, we will see that male students scored 668 while that of female students was 735. Meanwhile, private school students scored 653 while that of government school students was 750.

Table 66

No agency or organization including the United Nations has the right to interfere with countries that want to use their natural resources.

	Strongly				Strongly	Total
Gender/Value	Agree (5)	Agree	Neutral	Disagree	disagree	value/level score
Male	66	99	37	8	2	
value/level	330	396	111	16	2	855
Female	36	105	9	57	5	
value/level	180	420	27	114	5	746
Private	46	92	42	30	2	
value/level	230	368	126	60	2	786
Government	56	112	4	35	5	
value/level	280	448	12	70	5	815

Looking at the answers given for “*No agency or organization including the United Nations has the right to interfere with countries that want to use their natural resources*” on the table above, we will see that male students scored 855 while that of female students was 746. Meanwhile, students from private schools scored 786 while that of government school students was 815.

Table 67

Gazette, magazines, and television programs related to the environment should be given more space.

	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)	Total value/level score
Male	74	115	6	8	9	
value/level	370	460	18	16	9	873
Female	85	69	11	17	30	
value/level	425	267	33	34	30	798
Private	59	116	4	21	12	
value/level	295	464	12	42	12	825
Government	100	68	13	4	27	
value/level	400	272	39	8	27	746

Looking at the answers given for “*Gazette, magazines, and television programs related to the environment should be given more space*” on the table above, we will see that the male students scored 873 while that of female students was 798. Meanwhile, private school students scored 825 while that of government school students was 746.

Table 68

Countries should establish the ministry of environment to solve environmental problems.

	Strongly				Strongly	Total
Gender/Value	Agree	Agree	Neutral	Disagree	disagree	value/level score
Male	103	87	11	8	3	1060
value/level	515	348	33	16	3	915
Female	91	64	19	2	36	1060
value/level	455	256	57	4	36	808
Private	81	97	13	8	13	1060
value/level	405	388	39	16	13	861
Government	113	54	17	2	26	1060
value/level	565	216	51	8	26	866

Looking at the answers given for “*Countries should establish the ministry of environment to solve environmental problems*” on the table above, we will see that the male students scored 915 while that of female students was 808. Meanwhile, private school students scored 861 while that of government school students was 866.

Findings Based on Research Question

The followings are the findings based on the research questions earlier mentioned.

Table 69

Pro-environmental behavior of the secondary students differing in respect to Gender (Boys and Girls) and Schools (Government-owned and Private Schools).

	Male	Female	Private school	Government owned school
1	527	498	559	466
	457	480	457	480
2				
3	746	723	696	773
4	654	612	596	580
5	591	473	547	517
6	552	547	535	564
7	508	541	512	538
8	558	662	655	565
9	372	479	447	407
10	340	429	375	394
11	855	736	736	670
12	480	522	448	554
13	623	591	651	563
14	426	543	490	479
15	514	413	499	528
16	602	577	669	510
17	624	636	612	648
18	743	766	695	814
19	640	559	604	595
20	773	813	838	749
21	677	616	625	668
AVG	579.6	581.7	583.1	574.3

On comparing the response given by the students on pro-environmental test, it was seen on table 86 above that the female students exhibited a more pro-environmental behaviors with an average score of 581.7 than their male counterparts that had an average score of 579.6. meanwhile, students from the government owned schools had an average score of 574.3, scoring above students from private schools that had an average score of 583.1. On relating the results to the Pro-environmental scale on Table 3, it was found out that the level their pro-environmental behaviors is within average on the scale.

Table 70

Significant difference of student's response on Pro-Environmental behavior in respect to gender and to schools

Gender							
	Source of Variation	SS	df	MS	F	P-value	F crit
Pro-environmental Behaviors	Between Groups	50.38	1.00	50.38	0.00	0.95	4.08
	Within Groups	595646.10	40.00	14891.15			
	Total	595696.48	41.00				
Schools							
	Source of Variation	SS	df	MS	F	P-value	F crit
Pro-Environmental Behaviors	Between Groups	806.10	1.00	806.10	0.06	0.80	4.08
	Within Groups	508049.52	40.00	12701.24			
	Total	508855.62	41.00				

As seen on table 70, there was no significant difference found on students' response on Pro-Environmental behavior responses when compared to gender and schools because the P-values for both were all above 0.05.

**Attitudes towards environment differing in respect to Gender (Boys and Girls) and Schools
(Government-owned and Private Schools)**

Table 71

Difference in Student's response to questions on environmental attitude scale according to gender and according to schools

	Male	Female	Private school	Government owned school
1	739	787	718	808
2	916	902	858	903
3	840	739	804	895
4	662	734	693	703
5	679	766	681	460
6	667	712	737	642
7	596	575	648	523
8	670	543	636	577
9	833	860	828	865
10	818	758	812	764
11	555	636	552	639
12	802	806	843	777
13	783	836	828	793
14	584	603	593	561
15	770	840	809	801
16	668	735	653	750
17	855	746	786	815
18	873	798	825	746
19	915	808	861	866
AVG	748.5	746.5	745.5	730.9

On comparing the response to the questions from the students, it was seen that the students exhibited a relative high level of environmental attitude with the male having a score of 748.5 as against their female counterparts scoring 746.5 while for that of schools, private school students

had a more positive environmental attitude with an average score of 745.5 as against students from government schools that scored an average of 730.9.

Table 72

Significant difference of student's response on Environmental attitude in respect to gender and to schools

Gender							
	<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Environmental Attitude	Between Groups	44.24	1.00	44.24	0.00	0.95	4.11
	Within Groups	398028.84	36.00	11056.36			
	Total	398073.08	37.00				

School							
	<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Environmental Attitude	Between Groups	2019.18	1.00	2019.18	0.15	0.70	4.11
	Within Groups	472119.68	36.00	13114.44			
	Total	474138.87	37.00				

As seen on table 72, there was no significant difference found on students' response on Environmental Attitude responses when compared to gender and schools because the P-values for both were all above 0.05.

Student's level of environmental knowledge

A total of 18 questions was asked in order to assess the level of knowledge of the students who participated in the study about the environment and their response to those question is shown in table 73 below.

Table 73*Distribution according to student's environmental knowledge*

	Questions (perfect answer)	Frequency	%
1	Environmental issues are a danger and threat to whom? (<i>For all living things in the world</i>)	313	73.8
2	Which of the following must be disposed of into the trash? (<i>leftovers</i>)	282	66.6
3	Which of the following are from vertebrates? (<i>frog</i>)	324	76.4
4	Which is not necessary for growth of plants? (<i>starch</i>)	356	84
5	Which of the following examples show environmental problems which threaten the future of our world? (<i>Global warming and Acid rain</i>)	287	67.7
6	Which of the following air pollution is not caused by people? (<i>Volcanic eruption</i>)	290	68.4
7	Which of the following is not a natural disaster? (<i>Tankers and traffic accidents</i>)	319	75.2
8	Which of the following is not as a result of climate change, considering that all plant species in the world disappears? (<i>The amount of oxygen in the atmosphere increases</i>)	191	45
9	Which of the following event is useful for the environment? (<i>Rather than using a car, walk short distances</i>)	332	78.3
10	Indiscriminate disposal of domestic waste outside leads to? (<i>Contaminated air, water, and soil</i>)	343	80.9
11	Which of the following is a living entity? (<i>plants</i>)	334	78.8
12	What would be the result of environmental pollution? (<i>Clean air is reduced</i>)	351	82.8
13	Which of the following will occur due to an increase in the proportion of poisonous gas in the air? (<i>The world's climate will change and global warming will happen</i>)	359	84.7
14	Which of the following will occur due to uncontrolled hunting? (<i>Many animal generations would become extinct</i>)	280	65.1
15	Which of the following is a protected plant? (<i>Orchid</i>)	155	36
16	Which one of the following is the reason for the cities and industrial enterprises being built on the fertile land? (<i>We get more products</i>)	325	76.7
17	Which of the following is the camel habitat? (<i>desert</i>)	321	75.7
18	Which of the following is not a factor which destroyed the vegetation? (<i>Watering trees</i>)	295	69.6
	Average total respondents who answered correctly		71.42

After analyzing the data from their responses, results from average total respondents who answered correctly was 71.42% which showed a high level of environmental knowledge among the students.

Correlation between responses of Students on environmental knowledge and environmental attitudes

Table 74

Correlation between responses of Students on environmental knowledge and environmental attitudes

Variable		1	2
1.	Environmental Attitude	-	
2.	Environmental Knowledge	0.807	-

In order to determine if whether there is a correlation between environmental knowledge and environmental attitude level, we used the Pearson correlation coefficient and on comparing the individual responses scores on environmental knowledge with environmental attitude, the result displayed a strong positive correlation value of $r=0.807$ between the two variables, which means the higher the environmental knowledge, the positive their attitude towards issues of the environment and vice versa.

Discussions

On comparing our result findings with that of Haron *et al.* 2015; Ibrahim and Babayemi (2010) in our literature, we found out that there is some similarity with their findings, where environmental knowledge correlated positively with pro-environmental behavior.

Our study supports the findings from previous research made on pro-environmental behavior by Desrochers, *et al.*, (2019) stating that females are more environmentally friendly than the male, this may be due to females having these traits of kindness, honesty, full of emotions and compassions more than the male which makes them more conscious of the environment and more likely to participate in sustaining behaviors.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

This session of the research, contains the conclusion and recommendations based on result findings.

Conclusion

Pro-Environmental behavior, environmental attitude and environmental knowledge level of secondary school students in Abuja, Nigeria was assessed and suggestion was given based on the findings of this study.

When results for pro-environmental behavioral responses from the students were compared according to the objectives of the study, it was observed that the general student's pro-environmental behavioral level was on the average, but the female students exhibited more pro-environmental behaviors more than the male students.

Meanwhile, when we compared pro-environmental according to schools, it was observed that the students from private owned schools exhibited more environmentally friendly behaviors.

Students' environmental knowledge was high but has a room for improvement because the more the knowledge, the beneficial it is for our environments. On comparing environmental knowledge response with environmental attitudes, it was observed that the environmental knowledge response correlated with their attitude, this shows that environmental knowledge is a factor that determines environmental attitude.

Recommendations

The following recommendations were made after findings and conclusion were made in regards to the deficiency found in the students' responses.

In order to promote an environmentally friendly nature, it's suggested that government should invest in impacting environmental knowledge because the better the knowledge level, the better their attitude which helps the students to make rightful decision in the future.

Government should mandate all National TV, News Papers and Magazines to always advertise environmental related issue because what is seen sinks better in our subconscious mind than what is heard.

And also, environmental awareness program should always be organized in school right from the kindergarten stages.

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APPENDIX I

PERSONAL INFORMATION/CONSENT FORM

Dear Participant,

This survey is prepared to use in assessing your level of environmental knowledge, attitude towards the environment, and pro-environmental behaviors. All personal information collected through this survey will be kept anonymous and won't be shared with third parties. Filling this form means giving us consent to use collected data for the research purpose only.

Thank you in advance for your contributions.

Matthias John Chinenye

M.Ed. Student

Environmental Education and Management Department

Near East University

Part 1: Student's Profile

Gender:

Age:

School: Government/Private

Council:

APPENDIX II

Survey Questions

Environmental Attitude Test

	Strongly, I agree	I agree	neutral	disagree	Strongly disagree
1. I don't think that liquid gas for residential and commercial use is a contribution to the solution to the air pollution problem.					
2. Thinning the ozone layer threatens all people.					
3. To participate in activities related to environmental examination is a social responsibility					
4. It is exaggerated news that the sea river and soil are polluted.					
5. Drinking water in big cities is dirty enough to require the house to use water filters					
6. Efforts to protect sea turtles in some cities are seen as a waste of time.					
7. The Mediterranean climate zone has no problem with desertification.					

8. To meet the needs of people that need fresh air should be encouraged to make small houses located near the wooded area of the city.
9. Air, water, and soil are inexhaustible sources.
10. No matter which country does the nuclear test should be protected
11. Rapid environmental growth is a serious problem.
12. People who throw garbage or spill on the floor should be intervened
13. Unplanned construction is an environmental problem
14. The idea of environmental protection to prevent the development of developing countries is made up by westerners
15. Being sensitive to environmental issues does not prevent the development of a country.

16. The emergence of environmental groups rather than protecting the environment stem from the need to make friends
 17. No agency or organization including the United Nations has the right to interfere with countries that want to use their natural resources.
 18. Gazette, magazines, and television programs related to the environment should be given more space.
 19. Countries should establish the ministry of environment to solve environmental problems.
-

APPENDIX II

Environmental Knowledge Test.

1. Environmental issues are a danger and threat to whom.
 - A). only for the poor and developing countries
 - B). only for people living in big cities.
 - C). only for endangered plants and animals.
 - D). for all living things in the world.

2. Which of the following must be disposed of into the trash?
 - A). batteries
 - B). plastic bags.
 - C). leftovers.
 - D). papers.

3. Which of the following is from vertebrates?
 - A). snail
 - B). mussel.
 - C). frog.
 - D). butterfly.

4. Which is not necessary for the growth of plants?
 - A). water
 - B). sunlight.
 - C). starch.
 - D). soil.

5. Which of the following examples show environmental problems which threaten the future of our world?

- A). decreases in forest and clean freshwater resources
 - B). global warming and acid rain.
 - C). desertification and erosion.
 - D). the decrease in the number of species of plants and animals.
6. Which of the following air pollution is not caused by people?
- A). pollution from motor vehicles
 - B). factory pollution.
 - C). pollution of a volcanic eruption.
 - D). pollution from aircraft.
7. Which of the following is not a natural disaster?
- A). landslide and hail
 - B). storm and heavy fog.
 - C). tankers and traffic accidents.
 - D). floods and drought.
8. Which of the following is not a result of climate change, considering that all plant species in the world disappear?
- A). the number of carbon dioxides in the atmosphere increases
 - B). animals that are fed with plants will disappear.
 - C). the amount of oxygen in the atmosphere increases.
 - D). erosion and soil erosion increase.
9. Which of the following event is useful for the environment?
- A). rather than using a car, walk to a short distance
 - B). leaving the water open while shampooing hair in the bathroom.
 - C). turning on the lights in the room you're in the night.
 - D). to throw used plastic into the sea.
10. Throwing indiscriminate disposal of domestic waste outside leads to?

- A). Cleaner environment
 - B). decrease in diseases
 - C). more healthy plants, animals, and humans
 - D). contaminated air, water, and soil.
11. Which of the following is a living entity?
- A). sun
 - B). plants.
 - C). water.
 - D). weather.
12. What would be the result of environmental pollution?
- A). reduce in infectious diseases
 - B). clean air is reduced.
 - C). decrease in diseases.
 - D). it would be easier to breathe.
13. Which of the following will cause an increase in the proportion of poisonous gas in the air?
- A). it would be easier to breath
 - B). the world's climate will change and global warming will happen.
 - C). plants grow and develop better.
 - D). people live in a cleaner world.
14. Which of the following will occur due to uncontrolled hunting?
- A). the number of animals will increase
 - B). Many animal generations would become extinct.
 - C). existing animal species increase.
 - D). new animal species will be revealed.
15. Which of the following is a protected plant?

- A). Daisy
 - B). banana.
 - C). Orchid.
 - D). Pine.
16. Which one of the following is the reason for the cities and industrial enterprises being built on the fertile land?
- A). Agricultural field increases
 - B). increase in clean air.
 - C). we get more products.
 - D). forests are reduced.
17. Which of the following is the camel habitat?
- A). sea
 - B). desert.
 - C). mountain.
 - D). forest.
18. Which of the following is not a factor which destroyed the vegetation?
- A). the exhaust gases from factories
 - B). Watering trees.
 - C). Overgrazing.
 - D). Unplanned Urbanization.

APPENDIX IV

Pro-Environmental behavioral test.

NO	The extent to which you agree with the statements below	I never do it	I barely do it	Sometimes I do it	I do it often	I do it very often
D1	We separate the unused papers in our house and we notify or call the place for collection.					
D2	I make sure that the book and file papers I purchased are made up of recycled paper.					
D3	I normally throw away the used batteries into the garbage cans					
D4	I normally throw away the used bottles into the bottle piggy bank					
D5	I and my family give our used old furniture or books to those who need or collecting institutions or organizations					
D6	We are very careful about making energy saving at home or in the institution where I work. for example; keeping the electric lamp on for no reason, keeping the radio on and television on for no reason, while the heating is on, we do not					

want to keep the doors and window open

- D7** We usually chat with friends about environmental pollution.
- D8** I would be very careful with unnecessary use of light, radio, and television
- D9** I attend frequently to a conference or any meetings for the protection of the environment
- D10** I write letters to newspapers or journalists, politicians, or any other authorized people for the prevention of environmental pollution.
- D11** My family and I use energy-saving light bulbs
- D12** I force my friends and the people around me to use biofuels for both their car and home
- D13** When I buy gifts that are organic and harmless to the environment.
- D14** To those who want to buy white appliances, I urge them to buy a class white appliance

- D15** I and my family or group of friends use either one of our cars or public transport to protect the environment
- D16** I look around for recycling bins to throw away my used papers
- D17** My family and my friends frequently talk about the benefits and importance of alternative energy sources of wind and solar energy etc.
- D18** When there is a broken glass at home, we throw it into the kitchen trash disposed of along with vegetables and fruits peels
- D19** I follow the internet, television, newspapers for news of the use and expansion of alternative energy sources
- D20** I and friends wash fruits and vegetables in a bowl in the kitchen
- D21** I and my friends save the water we use for washing fruits to reuse it for toilets and bathroom cleanliness or for watering plants
-

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% **11**

BENZERLİK ENDEKSİ

% **6**

İNTERNET KAYNAKLARI

% **6**

YAYINLAR

% **4**

ÖĞRENCİ ÖDEVLERİ

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% **2**

2

Pihui Liu, Minmin Teng, Chuanfeng Han. "How does environmental knowledge translate into pro-environmental behaviors?: The mediating role of environmental attitudes and behavioral intentions", Science of The Total Environment, 2020

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