# Relationship of Residential Perception on Community Cleanliness and the (Working) Productivity Rate of All Employed Residents Working Within Barangay San Jose, Lipa City, Batangas

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## ABSTRACT

Waste management is one of many factors to consider in order to achieve a clean and thriving community. The study will focus on how residential perception on community cleanliness could affect employed residents' productivity rate within Barangay San Jose, Lipa City, Batangas. Mixed-method research, particularly Convergent Parallel Design, was the research design chosen and used. The researchers will employ this to help boost the data-gathering procedures allowing the researchers to painstakingly evaluate and interpret the data gathered. The locale of the study is at Barangay San Jose, Lipa City, Batangas. Moreover, the targeted respondents are all employed residents within Barangay San Jose, Lipa City, Batangas with ages ranging 18 years old and above. Furthermore, the goal of the study is to recognize the relationship of the residential perception on community cleanliness and their productivity rate. Additionally, the study will also look into the perceived effectiveness of using Waste-O to the perception of community cleanliness and the productivity rate of employed residents within Barangay San Jose, Lipa City, Batangas.


**Keywords**: perception of cleanliness, productivity rate, Waste-O, community cleanliness, perceived effect, improper waste management

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Chapter 1

# THE PROBLEM AND ITS BACKGROUND

## Introduction

Improper waste management is a problem caused by a collective of human misdeeds towards the environment. The continuous littering of trash results in infertile soil and thus poor agriculture in a locality. It affects some residents' small livelihood, resulting in worse living conditions, financially speaking. Meanwhile, waste that makes its way into bodies of water can cause a lack of potable water and the destruction of aquatic life.

Moreover, when people burn their wastes, the smoke released into the atmosphere can trap or absorb more of the sun's heat, thus increasing Earth's temperature. In addition, it affects the environment and human health since by disposing of garbage in the oceans, fishes will die, decreasing humans' source of food. When everyone burns their trash, it affects the atmosphere; and it will affect everyone's skin because of radiation and lead to respiratory diseases, so improper waste management is a big problem, and everyone must take necessary actions to counter it. Furthermore, improper waste management is still a global problem since, according to the World Bank (2019), it often contains 20%-50% of city budgets. Also, operating proper waste management requires systems that are logical, sustainable, and supported by the government.

Moreover, based on the surveys and interviews conducted by the researchers with the residents and barangay officials of Barangay San Jose, Lipa City, Batangas, improper waste management is the most prevalent problem of the community due to a lack of awareness and information about the matter. In addition, the community is located near a river that is currently polluted due to the amount of garbage thrown in the area, which cannot be a source of clean water. Therefore, the productivity of people living near it could be affected because their perspective of cleanliness can influence their focus on their tasks. Particularly the residents living near the land and bodies of water are directly affected by improper waste management. According to a study by the Princeton University researchers cited in Gordon (2021), a dirty place could make it difficult for someone to focus on their task. Also, they stated that a person's visual perception could be overwhelmed by the unnecessary items unrelated to their task, making it harder for them to complete jobs efficiently.

Consequently, a person's productivity for the day could drastically decrease, especially when there are unfulfilled tasks since improper waste management could lead to a dirty workplace and can adversely impact a person's physical capabilities. According to Poss (2019), having a dirty workplace may lead to problems, specifically to employees, in unexpected ways. Also, he stated that when workplaces are unclean, it could lessen employees' energy levels, leading to low motivation and lower productivity. According to Tater (2019), when there is a clean workplace for employees, it could significantly boost their morale and overall mindset as it gives them a rejuvenating feeling of a clean slate that helps them get a fresh start for the day. Furthermore, a study conducted by Nuzrath and Ruzaik about the public perceptions on solid waste

management in 2018 stated that a community concerned about their environment but not educated about proper waste management tends to think that solid waste management is the sole responsibility of respective local authorities. Therefore, this reason could significantly affect the perceived cleanliness, affecting the productivity of employed residents.

With the issue of improper waste management in the community, this study aims to understand the relationship between community cleanliness and the productivity rate of the employed residents in Barangay San Jose, Lipa City, Batangas. Thus, identifying the relationship between the two variables will help their community's cleanliness and the employed resident's overall productivity rate. Respondents will use Waste-O, a technical application that may know the relationship between the two variables that provide residents' knowledge about different types of garbage. Its examples include information on varying junk shops or dumpsites and helpful videos that will teach the residents to recycle different garbages. Additionally, it will help the community be disciplined and responsible through the app since officials can give schedules and announcements on when garbage will be collected and if there will be cleanup activities. Moreover, the residents will use the Waste-O app to know its effects on the perception of community cleanliness and productivity rate, which can help researchers to know if there will be a relationship or not. The researchers will conduct the study in San Jose, Batangas. However, due to the current circumstances, respondents and researchers will be limited inside their houses only; thus, researchers will strictly conduct this study digitally to secure everyone who is part of this research.

Furthermore, since the main target of this study is employed residents working within Barangay San Jose, Lipa City, Batangas, they will be the primary source of data. The employed residents will be the ones to answer the approved questionnaire and attend an interview for the data collection of the study. Additionally, the employed residents' perception of community cleanliness and productivity rate is needed for the researchers to determine the significant relationship of both variables that could help in community cleanliness and their productivity rate. Additionally, different ages and personalities have different perceptions of cleanliness and different productivity rates. For that reason, researchers aim to discuss the relationship between the perception of community cleanliness and the productivity rate of the employed residents in Barangay San Jose, Lipa City, Batangas.

The study involves the relationship of perception of community cleanliness and the productivity rate of the employed residents in Barangay San Jose, Lipa City, Batangas. In addition to this, the quantitative data that researchers will use shall come from the approved questionnaires in which 30 employed residents from Barangay San Jose, Lipa City, Batangas will answer. Also, the qualitative data connected to the quantitative data will be obtained through the researchers' online interviews and approved questionnaires. A total of 10 employed residents will be interviewed and transcribed by the researchers. Moreover, many researchers have conducted a study regarding improper waste management that could affect many individuals in different ways, such as their health. However, most of them overlooked studying the relationship between the perception of cleanliness and productivity rate and the effects of an environmental app between the two variables. Thus, this is why the study aims to know if

there will be a significant relationship between the respondents' perception of cleanliness and their productivity rate while also knowing the perceived effects of an environmental app on their perception of cleanliness and productivity rate.

**Statement of the Problem**

The research proposal entitled “Relationship of Residential Perception on Community Cleanliness and the (Working) Productivity Rate of All Employed Residents Working Within Barangay San Jose, Lipa City, Batangas” aims to know the answers to the following questions:

1. What are the residents’ views towards fulfilling responsibilities in a clean community?
2. What is the importance of cleanliness in the quality of the community’s health and environment?
3. What is the perceived effect of using Waste-O on the following aspects:
    a. the residential perception of the respondents
    b. the productivity rate of the respondents
4. What is the level of perception of employed residents towards their community’s cleanliness?
5. What is the productivity rate of all the employed residents working within the community of Barangay San Jose, Lipa City, Batangas?
6. Is there a significant relationship between the residential perception of community cleanliness and the productivity rate of all employed residents within the community of Barangay San Jose, Lipa City, Batangas? What are the factors that affect their productivity rate?

**Hypothesis**

**Ho**: There is no significant relationship between the residential perception of community cleanliness and the productivity rate of all employed residents within the community of Barangay San Jose, Lipa City, Batangas

**Significance of the study**

The study was conducted in order to know if there is a relationship between the residential perception of community cleanliness and the productivity rate of all employed residents, particularly in Barangay San Jose, Lipa City, Batangas. Moreover, the study was also conducted to know the perceived effects of Waste-O on the residential perception of community cleanliness and the productivity rate of all employed residents. Individuals and groups who could benefit from the study are as follows::

***For the Respondents***, specifically, the employed residents of Barangay San Jose, will recognize the relationship between cleanliness and their productivity rate. The respondents will gain a better understanding of their nature as residents by learning about both variables: residential perception of community cleanliness and productivity rate of all employed residents.

***For the Businesses within Barangay San Jose, Lipa City, Batangas***, this study will give them knowledge regarding the importance of having a clean workplace to their employees. The research could help them know the necessary actions to be done for their employees to have a higher productivity rate.

***For the NGO or Government Offices***, this study will be able to provide them with the necessary information on what acts are affecting the community's environment and the productivity of all those working within the barangay. Such that these NGO and government offices, through the study, will receive proper recommendations on how to handle the environmental condition as well increase the productivity of workers under their jurisdiction.

***For the Future Researchers***, as findings in this study could be used as a future reference for other researchers, such as checking the validity of findings and citing data. The study could be used in the field of the environment so that researchers could gain new insights and enhance their knowledge regarding the topic of improper waste management.

**Scope and Limitations**

The scope of the study covers the testing of the significant relationship between the perception of community cleanliness and the productivity rate of all employed residents working within Barangay San Jose, Lipa City, Batangas. Moreover, it will also examine the perceived effect of using Waste-O on the respondent's perception of cleanliness and productivity rate. Additionally, the proponents of the study will also look at the importance of cleanliness in the quality of the community's health and environment as the main perceived effect of improper waste management in the community.

In order to find the necessary data, the researchers will be using a mixed-method approach, specifically Convergent Parallel research design, which means that the researchers will gather the quantitative and qualitative data at the same time. As for the sampling design, researchers will use Purposive Sampling as researchers shall only focus on gathering data from the employed residents working within Barangay San Jose, Lipa City Batangas. Furthermore, the appropriate research tools to be used will be through online interviews and survey questionnaires. The chosen research tools will be essential in this research as they will aid researchers in knowing the respondents' perceptions on cleanliness and their productivity rate. Moreover, making the interview and survey questionnaire is one of the difficulties the researchers encountered since the questions asked must be engaging to the respondents for the appropriate data to be collected. Additionally, researchers should eliminate bias when asking questions and be straight to the point. Lastly, for the data analysis and interpretation, researchers will use Glaserian Coding to analyze the residential perception on community cleanliness, will use a five-point Likert scale questionnaire to measure the productivity rate of the employed residents, and will use Pearson r Correlation to identify whether the two variables share a positive, negative, or zero relationship.

The limitations of the study are caused by the current situation of the world. It is a known fact that coronavirus, COVID-19, has spread worldwide that leads to the ongoing pandemic, which is why researchers that will conduct this study should follow the government's safety measures so it will be done without any personal contact. With that being said, the data gathering process will be done through the digital environment, such

as conducting online questionnaires and online interviews to the target respondents. Due to this, researchers could face a problem where there will be misunderstandings of information leading to an invalid study.

**Operational definition of terms**

Community Cleanliness. It is known as how clean a certain community is. This means that if a community practices proper waste management, then there will be community cleanliness.

Perception. It is defined as how one person perceives someone or something. It is also a great way to know whether a certain community is clean or not.

Productivity Rate. It refers to the rate of the output to input of a person or business. Which means that a person or business has a high productivity if a greater volume of output is achieved with minimal input volume.

Waste-O. Is an environmental application created by the researchers that functions to teach its users to practice proper waste management.

Chapter 2

# REVIEW OF RELATED LITERATURE AND STUDIES

## Environment

The environment is the condition of being surrounded by entities or circumstances. Most commonly, the environment is a place where living things interact with each other and with non-living things that directly or indirectly influence the health, growth, and other aspects of an individual or a thing.

Additionally, it is a known fact that the environment plays an essential role in the survival of humans, directly affecting their lifestyles as a better environment leads to better acquisition of knowledge, self-discipline, self-control, and better mental health overall (Nagaraj, 2020) . The environment referring to the conditions that surround an individual's growth and development is a type of environment that has more than one affecting factor such as society, family, hobbies, work, and even government. One example of an environment is employees' working environment, wherein human workers require social development and deserve a good working environment to avoid workplace stress. Thus, a safe and healthy environment for workers results in better performance and productivity (Omair et al. 2019). On the other hand, another known type of environment is called the natural environment; it consists of everything around humans, plants, and animals. Furthermore, it is the current world humans live in, the vast oceans, wide desert, rich forests, and the towering mountains signaling that the natural environment is the compromise between humans and nature. However, the steady increase of human population and development has led to damages in the natural

environment because of the increase in deforestation for urbanization. Also, the escalated amount of products created to satisfy the needs and desires of the people consequently produce more wastes. However, wastes do not immediately harm the environment; instead, it is improperly disposing or managing them that negatively affect the land, water, air, the surrounding environment, and its inhabitants.

**Waste Management**

Waste management describes the different actions needed to dispose and manage waste properly; it could be done by recycling, reusing, or even reducing waste. Also, its main objective is to lessen other health and environmental risks. Furthermore, it is important to take care of the environment because lack of care for the environment can lead to various negative repercussions such as pollution, disease, worsening the climate change issue, and damaging the ozone layer due to lack of care from the people and waste litter (Idowu, 2018). Moreover, waste management is defined as actions and activities taken to manage the flow of waste material. It is also the collection, treatment, and disposal of solid materials that are no longer useful (Nathanson, 2020). In addition, the World Bank (2018) stated that the world disposes of 2.01 billion municipal solid waste yearly, of which about 33% are not managed properly. Therefore, proper practice of waste management is mostly considered beneficial as it improves the environment and the lives of people, which also makes it a relevant point of inquiry.

Furthermore, actions improving the proper waste management of each community leads to positive effects on the environment and the people themselves while also lessening improper waste management. Such actions include being responsible

enough to segregate and dispose of waste, which has a significant impact on the lives of the people, creating healthier living conditions, and providing them with fresher air to breathe. Also, it can help combat climate change, protecting the environment for future generations.

Despite the positive knowledge regarding the effects of proper waste management, it is still inevitable in some communities to practice improper waste management as there are numerous reasons why waste does not get properly managed (Dragani, 2019). One of the most prevalent causes of improper waste management is the lack of knowledge about proper waste management and dangerous waste; most people do not know what wastes are toxic and how to manage them if there are. Furthermore, other causes include inaccessibility to proper waste collection, lack of funds, professionals such as garbage collectors, and infrastructures such as recycling centers and junk shops in rural areas, which hinders the people's desire to practice proper waste management. Lastly, it can also be due to the different businesses and politicians, who, despite knowing the dangers and negative effects of improper waste management, continue to be involved in the burning of wastes and improper sewage disposals.

Consequently, Bundhoo (2018) wrote that waste collection is low in the least developed countries, and due to irregular waste collection, many people in the least developed countries resort to illegal practices such as illegal dumping or open burning of wastes. Also, he stated that it not only affects the environment but also affects the health and well-being of humans due to water contamination, rodent and insect attraction, and

flooding caused by blocked drainage. Moreover, impacts of inadequate solid waste management processes on human health include infection transmission, physical injury, non-communicable diseases, and emotional and psychological effects. In particular, pollutants from landfills can increase the risk of cancer, birth defects, reproductive disorders, and respiratory diseases.

In addition, a study by Abdulghani et al. (2019) about the effects of inappropriate waste management on health emphasized that improvement in the community's awareness towards domestic waste management may shed new light on tackling the issue. A carefully thought-out strategy about proper waste management can be developed to further improve a community's awareness towards domestic waste management. With this, the people will be engaged in making solutions to counter waste management issues and be equipped with knowledge regarding proper waste management to improve their waste management habits. In addition, according to Ruliana et al. (2019), a primary factor for people to participate in waste management programs is the circulation of information regarding the program (p.24).

Furthermore, waste management is the act of managing waste based on its nature, from solid to toxic waste. It refers to handling waste that can be either proper or improper, wherein proper waste management includes segregation, recycling, and proper disposal. While improper waste disposal, on the other hand, is the illegal practices performed, namely illegal dumping or openly burning trash. Thus, improper waste disposal is the result of a lack of knowledge regarding the matter, lack of funds, and little government involvement. This unethical behavior has resulted in affecting the

health and well-being of humans, water contamination, insect and rodent attraction, and different disasters resulting from improper waste management. Therefore, adequate knowledge of the community on proper disposal of solid waste together with a carefully thought out strategy on proper waste management can contribute to better health and living conditions in the community. Waste management is a major factor of the study as it is the root problem being solved by the project. This topic will be part of the data-gathering phase of the study, measuring how its condition will affect the productivity of the respondents of the study. Therefore, the concept of waste management plays a significant role in accomplishing the research as an act performed by the respondents of this study.

**Perception**

Perception is commonly defined as the way humans see things. Higuchi, Giordani, Zanella, Zorzi, and Altintas (2019) defined perception as the process of selecting, organizing, and interpreting information. Thus, it relays the message that a perception is an act of observing the information transferred from the five human senses to the brain and deciding how it should be thought of and interpreted. Twedt and Proffitt (2018) also deemed perception as a study of the process of sensory information into perceptual experiences, and actions are directed by sensory information processed outside of awareness. Furthermore, perception is a stimulation exercise where environmental information is transformed into meaningful thought and information(Qiong, 2017, as cited in Honesty, Honesty, & Pebriyani, 2020).

Moreover, living with and in the physical outside world means needing to process information from it to make sense of each one's actions in their daily lives. Qiong (2017) stated that "perception is the method of having understanding and awareness of sensory information.". In addition, the word "perception" is derived from the Latin words perceptio, percipio, which means receiving, collecting, the action of taking possession, and apprehension with the mind or senses.

Perception also differs from how they were perceived, from visual perception, auditory perception, olfactory perception, haptic perception, and gustatory perception. These forms of perception were examples of perceptions derived from human beings' experiences. Everything humans see from their eyes, what people smell, hear, taste, and touch are factors that lead to different perceptions. Apart from this, there is also an existing unconscious perception within humans: the ability to perceive time or events that occur in time. The nature of time is rooted in the human body, and the constant spur of information from human interoceptive creates perceptions that define human awareness of time. (Di Lernia et al., 2018).

Furthermore, many things affect the perception of a person. According to Harappa (2021), people's perception is affected by their differences, motivations, organizational behaviors, past experiences, and external factors. Thus, individual differences mean each person has different minds, thoughts, beliefs, and opinions. Whereas, when asked in surveys or interviews, a person's answer is different, though some have the same answer. Next, motivation affects a person's perception of life; when

a person has a goal and is motivated to do something or to change little by little, it can affect a person's perception of the things that are seen and learned. Third, in organizational behaviors, a person's perception is affected by what a person tends to do, but it will change when a person goes to a different environment; it will influence one's perception. Fourth, past experiences will help a person learn in life because they have experienced it, and it is necessary to change the wrong things a person committed. Lastly, external factors in a person's perception are affected by what a person thinks of them, others' expectations, and the norms in a different society.

Additionally, according to Olivera (2020), the impact of perception on humans depends on their experiences and on how they see that particular event in their life. People tend to exert less effort on their work and perform poorly due to their negative perception. Therefore to develop a positive perception, he/she must improve their overall mindset for them to perform their best work which further leads to an increase in organizational effectiveness. More so, perception is important in everyday life. According to Suvorova (2015), perception can help people relate to their daily life; when people compare two things or events, it helps a person have a clearer view of how they see things and the entirety of what people do. Perception directly affects the thoughts, actions, and behaviors of an individual; also, it assists them in recognizing different objects, situations, and patterns. Moreover, perception helps the human body react appropriately to certain events or situations by analyzing the perceived objects, surroundings, situations, and circumstances. After perceiving the situation, the information retained in their minds will allow their bodies and minds to behave or act according to the situation and what they think or want to do. In a review of literature by

Vos et al. (2018), a distinction between cleanliness and the perception of cleanliness is highlighted, wherein cleanliness pertains to tangible aspects like grime and littered waste, and perception of cleanliness is based on the people's view of their environment's cleanliness which is thus more prone to bias (p.4). Additionally, a link between a positive perception of cleanliness and an increase in satisfaction of leisure areas is shown, evident in feelings of increased reputability being shown by people to services, being more pronounced in areas where people spend an increased amount of time. (p.14-18).

Perception is commonly defined as how humans perceive or understand certain aspects of their daily lives. Different perspectives arrive from different experiences that people have encountered. Moreover, perception is commonly acquired from the human body's five senses, while unconsciously, human bodies perceive time. Generally, perception is the act of having understanding and awareness of the surroundings. Additionally, perception is deemed important because it happens in daily life; it gives people the ability to compare, understand, evaluate choices, and react to certain situations. On the other hand, residential perception refers to the view of people in terms of the cleanliness of the environment. Whereas there is an evident connection between the positive perception of cleanliness and places where people can spend a lot of time in. Therefore, residential perception or perception, in general, is a huge contributing factor to this study. This concept of perception will be the basis of the research question on how this topic will give the proponents various data to come up with effective research. In addition, this concept is a factor of how people work in productivity in relation to their perception of cleanliness in their working environment.

**Productivity**

Productivity is defined as the ratio of output to input; therefore, high productivity means that a greater volume of output is achieved with minimal input volume. Thus, a link between cleanliness and productivity can be created if cleanliness can influence either the output or input volume. According to Shobe (2018), the workplace environment has been a key influencing factor when it comes to satisfaction and productivity. The workplace environment is the setting in which employees work and is an important aspect of their work as it could bring positive or negative effects on them, making it important to have a positive and good work environment. Moreover, productivity can often be determined by factors such as personalization, color, privacy, interior painting, lighting, windows, air quality, temperature, noise levels, and accessibility. This shows how working environments correlate to the productivity rate of employees.

Due to the pressing environmental issues and illnesses, such as dengue, trachoma, and respiratory problems, employees increasingly recognize the importance of having a clean work environment. Studies showed that unclean environments can distract employees, affecting their state of mind and productivity (Fidelis, 2018). Also, it can affect the feelings of well-being, work relationships, and overall health of the workers. According to a study by Horrevorts et al. in 2017, measured cleanliness is correlated to perceived cleanliness, with the former being shown to have a significant relationship with employee productivity and satisfaction while the latter had no effect. In addition, the significance of clean workspaces being a possible worthwhile investment

was shown as the increased productivity can be beneficial to an organization. However, the narrowness of the research was acknowledged as it only covered activities in a non-profit office environment, so significant generalizations cannot be made (p.15).

Furthermore, according to Perkins (2021), if employees feel like their workplace is not professional, it can affect them whenever they are in that workspace, possibly affecting their mental and physical state even if they do not notice it. Additionally, it could help employees reduce their stress level and feel better to be immersed in the work that employees need to do. With this, a safe and clean workspace atmosphere is convincing enough to get employees in a good mood at work. Consequently, if an employee has an unclean workplace, it may lead to a loss of productivity or focus in their jobs. According to Poss (2019), a dirty workplace can cause problems to employees in unsuspecting ways. An example of this is when a workplace has dust and bacterias that could lessen their energy levels or which lead to loss of motivation.

Moreover, according to Shpak (2019), the simplest formula to measure productivity is to collate output to input: productivity = output divided by input. The results of the equation differentiate the units of work per unit of time. The said units change based on the different elements such as industry or department; also, other businesses could examine their productivity differently than other businesses. Additionally, according to Soetan (2018), measuring productivity can help with performance management since feedback that is supported by data is an easy way to show employees their strengths and weaknesses. An example is when one employee is doing their work within a

deadline but is further behind than others, it could help them consider what they need to improve for them not to be behind.

Overall, having a well-organized workplace environment can boost the productivity and efficiency of employees. According to Fidelis (2018), a clean environment can also safeguard employees' health and reduce the rate of employees getting sick. With this, the employees can spend more time working and reduce their absences. In contrast, distractions can greatly affect the progress of employees. Having the chance to go through work without distractions can lead to effective collaboration and productivity. Productivity is defined as the total output of employees. Different factors could affect productivity, but one example is the workplace environment; this could either positively or negatively affect employees. The particular workplace could have other air quality, accessibility, noise levels, and the likes that could have specific effects on different employees. Additionally, it is essential to have a clean workplace as it could also affect productivity. Unclean environments could lead to distractions on employees, which could affect their productivity in work. It will also lead to low energy levels, which leads to low productivity. Consequently, a clean environment could lead to low-stress levels and a good mood for employees, which leads to high productivity in the workplace. A clean environment could also lead to a safer workplace for employees as it lowers their chances of getting sick. Moreover, to measure productivity, the output of employees will be divided by their input, and it is essential as it could help manage the performance of employees. Overall, productivity will be a necessary topic for the research to find if the perception of the respondents on cleanliness is related to their productivity.

**Technological Application**

In the daily lives of people, technology is continuously integrated in the form of transportation, manufacturing, and other technology involving the internet and applications. Moreover, technology is relevant in modern times since, according to Awan (2020), technology has had a huge growth for the past twenty years due to the new technological advancements, especially the interconnection and distribution of smart devices that could be easily accessed by anyone today. In addition, technology has become the embodiment of the world today. Digitization, in particular, is an aspect of technology that has reshaped the human society of the modern world. Therefore, with the use of technology like mobile applications, people will be able to reach out to a wider area and help develop innovative solutions to problems concerning a lot of people.

Pham (2021) defined mobile applications as software run on other mobile devices, also known as apps. Various services today need the help of Mobile Applications such as medications, GPS, banking, and tracker. Additionally, applications are important today since it could give everyone access to different sites, such as health-related, news, and entertainment sites, and learning materials with just a few clicks. Based on an article written by Allen in 2019, technology has a big impact on society since it helps with the learning of everyone, making it easier to find educational sites and references, and keeps them up to date regarding current issues and events in society. With the help of different applications, learning is made more accessible and interactive, especially for children, due to lots of colorful and engaging applications. Also, it helps everyone get better access to different resources and information at any time of

the day, like being updated when garbage will be collected and learning how to recycle certain types of trash. Lastly, it helps the community to have a clean environment and disciplined and responsible residents.

Furthermore, Okafor (2021) stated that more eco-applications concerning environmental issues are created as time passes. Environmental applications like Giki from the United Kingdom, GoodGuide, iHuerting, aim to use technology to address environmental issues and develop ways to counter them. Also, it is useful in making environmentally-friendly decisions to help reduce carbon footprints, such as eating more vegetables, unplugging unused appliances, and using eco-friendly bags (Brown, 2020). Moreover, it can help in achieving the UN SDG goals, contributing to different areas of the world as a whole, mainly SDG goal six, which is clean water and sanitation; SDG goal 13, which is climate action, SDG 14, which is life on water and SDG goal 15 which is life on land. The app could help achieve the said SDGs as it will allow its users to reduce their carbon footprints and help them have a value of discipline to have a cleaner environment. In turn, helping to have more sterile water, attain climate action, and have a better life on land and water.

Technology has a beneficial effect on the holistic development of young people. According to Barone (2018), making sure that during holistic development, children should take all of the knowledge that is beneficial for them so that it may result in positive effects that can help them in their lives such as creativity and freedom of expression, socialization and relationship building, independence and empowerment, problem solving and perseverance, and entrepreneurial spirit. However, even if technology has a

positive side in the holistic development of people, it can also lead to negative effects. In a study conducted by Gottschalk in 2019, the use of technology has a lot of consequences, such as impacts on children's brains and socio-emotional, cognitive and physical development. Technology can have positive and negative effects on holistic development, and with a proper balance, it can be beneficial to the users.

Based on a study conducted by Balinska et al. (2021), eco-apps were shown to affect environmental behavior significantly. The apps involved in the study were designed to promote environmentally positive activities; BlaBlaCar enabled users to share cars; Gdzie Wyrzucić aided in sorting waste, and the local bike-sharing system uses Veturilo. Results showed that students positively evaluated their environmental activities through the apps, with the most desired features being reliability, practicality, and regular updates. Another observation noted was that most recognized apps were disseminated through traditional media, indicating its effectiveness in promoting them.

Technology such as mobile applications is an essential part of the world today. It could help everyone easily access information around the internet; learning will be easier for everyone who uses it. Different eco-mobile applications keep people informed about the state of the local or international environment. Additionally, technology could also positively affect holistic development such as problem-solving and could also lead to negative effects such as socio-emotional development. Using a modern way to approach the problem of improper waste management, as a mobile application can teach users about the types of wastes and the importance of proper waste management, which can expand their perspective on their community's cleanliness and boost their productivity.

Overall, the topic of technology will be beneficial to the research as a mobile application will be used to know if it could help with the respondents' perception of the cleanliness of the environment.

Thus, to further support the importance of a technological application regarding the residents' perception on cleanliness and their behavior when it comes to their productivity. The Technological Acceptance Model Theory will be used. Kalayou, Endehabtu, and Tilahun (2020) pointed out that Technological Acceptance Model Theory is known to be one of the popular theories that aim to know how users accept and interact with a technology or a mobile application in the research. This theory proves that there are factors (perceived usefulness and ease of use) influencing the behavioral intention of users to use the application. Additionally, Lin and Juan (2020) wrote that if users have a high intention of using an application, then it could lead to higher engagement and a longer time using the application.

**Synthesis**

The relevance of proper waste management in combating environmental degradation will only continue to grow as more time passes, and humans continue to expand. However, there have been challenges in implementing these measures, such as environmentally harmful waste disposal methods and a lack of information. One possible solution to overcome these is through the innovative use of technology. Eco-apps can encourage environmentally positive behavior in people, and a widespread practice may mitigate and prevent the negative effects of improper waste disposal. The proper disposal of waste brings several benefits for people and the environment. One such

benefit is the cleanliness it brings, being a possible influence on the perception of people. A positive perception of cleanliness was shown to improve neighborhood satisfaction, and physical cleanliness was also shown to have a positive effect on employee productivity.

Chapter 3

# THEORETICAL/CONCEPTUAL FRAMEWORK

## Theoretical Framework

Improper waste management affects different aspects of human life; one of those aspects is their quality of life in their homes, whether they are living in a healthy and clean place or a dirty environment. This problem promotes littered trash, burning of wastes, irresponsible segregation and disposal, and others that negatively impact the residents' perception towards the cleanliness of their environment or surroundings. However, to further guide their perception on cleanliness, the researchers will provide an application that aims to fortify the resident's judgment towards cleanliness.

Hence, the research will adapt the Technology Acceptance Model theory to determine the effectiveness of the application in fortifying the resident's perception on cleanliness and the relationship between the resident's fortified perception on cleanliness and their productivity rate. Initially, the Technology Acceptance Model theory was formulated by Davis in 1989, who argued about the system not being used for improving organizational performance but instead used to determine users' acceptance of different applications. It pushed him to develop the Technology Acceptance Model, designed to evaluate whether a new technology is based on customer perspectives and to know how people accept or reject an application (Juan et al., 2020). Additionally, the Technology Acceptance Model examines if an individual's intention to use a system will be verified by perceived usefulness and ease of use of the given scenario. According to Buabeng-Andoh (2018), TAM was developed from the Theory of Reasonable Action by

Davis in 1989 to explain technology usage behavior; therefore, TAM uses the Theory of Reasonable Action as a theoretical foundation to point out the connection between the two central beliefs: perceived usefulness and perceived ease of use, and users' attitudes, intentions, and actual usage of technology.

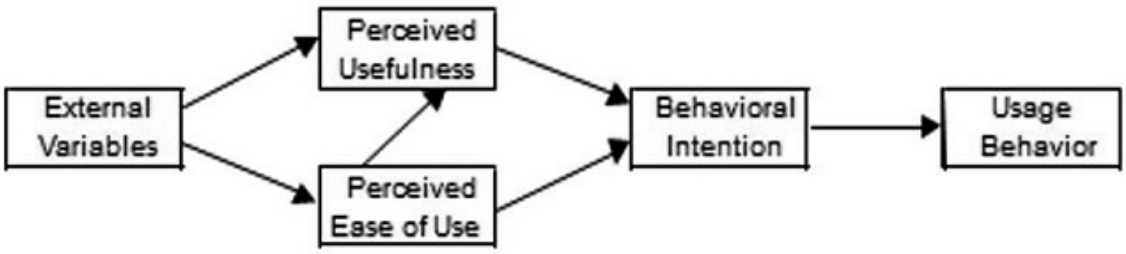


**Figure 1. Technology Acceptance Model (Adapted from PC Lai. 2017)**

The model assessed two particular beliefs: **Perceived Usefulness** (PU) and **Perceived Ease of Use** (PEU). Perceived Usefulness is known as the possibility that the use of an application will improve the user's actions, while Perceived Ease of Use is known as the extent to which the user presumes the application to be effortless (Davis, 1989 as cited in Lai, 2017). Moreover, the Technology Acceptance Model states that the Perceived Usefulness and Perceived Ease of Use are also affected by external variables such as differences among users, system characteristics, the influence of people around the user, and facilitating circumstances (Bull et. al, 2019). Consequently, the Technology Acceptance Model will guide the researchers to know the perception towards cleanliness and the productivity rate of the respondents by looking at their Perceived Usefulness and Perceived Ease of Use as it could affect the two said variables. Also, its basic concept will be the basis of the study as it will help researchers know whether or not the

implemented app, Waste-O, will be effective to the users or not and whether it will be convenient enough to be accepted by the users or not.

**Conceptual Framework**

Furthermore, for relevant data to be found, the processing of the usage of application should be conducted, and it should expect the user's perception on community cleanliness and their productivity rate in line with the Technology Acceptance Model. Perception towards community cleanliness will be looked at as it influences the way people view the overall cleanliness of their community and will determine the cleanliness of the community. According to Wells and Daunt (2015), cited in Vos et al. (2018), having a poor condition was linked to a negative perception of cleanliness. Moreover, the perception of people towards the cleanliness of their environment affects their behavior and willingness to work. According to Horrevorts et al. (2018), they found a connection between cleanliness and a positive relationship with productivity in the employees' work environment, which means that workers have higher motivation to work in cleaner environments. At the same time, having less motivation in a dirtier environment and encountering adverse health effects may reduce the capacity of the employees to work.

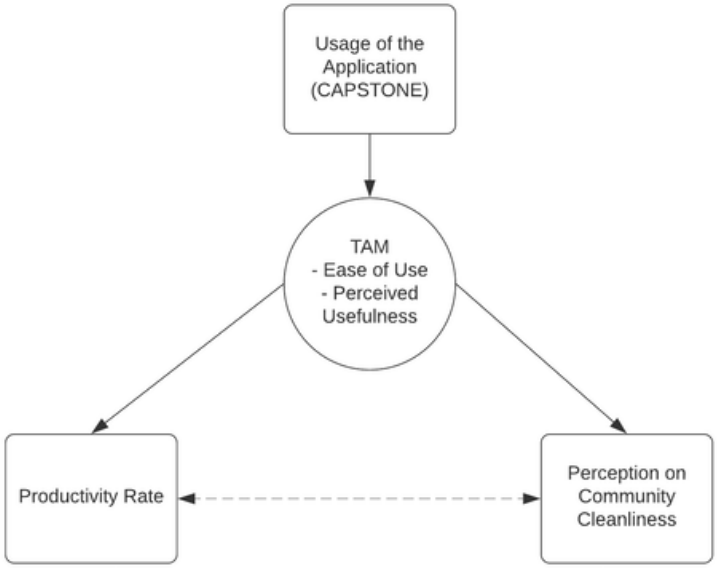


**Figure 2. Relationship of Resident's Perception towards Cleanliness and Productivity Rate adapted from Technology Acceptance Model**

Figure 2 shows the relationship between the residential perception of the residents on community cleanliness and the productivity rate of all employed residents of the community. Consequently, for the research to determine if the variables have a significant relationship, the project must attain what TAM states; perceived usefulness and perceived ease of use and "deemed convenient and effortless to use" in the application provided to the users. The attainment of such determines whether or not the variables could be measured. Therefore, this affects both the perception and productivity rate of residents as the application, how it will be accepted, is an input to the residents' perception towards community cleanliness. In addition, both variables are subject to the assumption that they may be related despite their different natures; the respondent's perception and their productivity rate are questioned whether they affect each other either way. The framework shows an underlying concept that tells whether an application

is a factor of perception and productivity. Moreover, the Technology Acceptance Model was used in previous studies; according to Portz et al. (2019), with the help of the said theory, they described the user interface and user experience, intent of use, and behavior of use among older adults Kaiser patients with multiple chronic conditions. Also, with the help of TAM, they aim to find how the participants use the portal and if the said portal was valuable and usable to the older Kaiser patients. Consequently, TAM was also used in their study to know the participants' opinions and experiences regarding the use of the portal, which is the same as the research study regarding the use of an environmental app.

Chapter 4

# RESEARCH METHODOLOGY

## Research Design

The research design will act as the main guide of the whole research itself as it will be the basis and will give researchers the steps on how the gathered data will be examined. Furthermore, the researchers will apply a mixed-method approach, particularly Convergent Parallel research design, where both the qualitative and quantitative data will be gathered simultaneously and analyzed individually. After both data have been analyzed individually, results will be compared so that a conclusion can be made and for both data to be associated with one another (George, 2021). Overall, the study targets to find the effect of the Waste-O app on the residents to their residential perception of cleanliness and productivity rate and to know if there is any significant relationship between the two said variables. In addition, given the time frame and resources of the research, the ability to collect data at the same time would be convenient to the researchers and would fit the conceptual framework the study uses.

## Sampling Design

The sampling design that will be used for the study will be non-probability sampling, specifically purposive sampling, wherein respondents will be selected on predetermined criteria, and every individual will not have a chance of being chosen (McCombes, 2021). Moreover, according to Crossman (2020), the purposive sample is a non-probability sample where respondents are selected based on their traits and the goal of the whole research. Also, the said method will choose the respondents that are

essential to the study and not the ones that will be chosen randomly. The researchers will choose the employed residents of the study as they fall on particular qualifications, such as different perceptions and productivity rates that could significantly contribute to the research. In addition, this sampling technique will increase the chances of getting valid and reliable data for explicitly choosing the respondents based on their predetermined conditions.

**Respondents Of The Study**

In conjunction with the chosen sampling design, the respondents to be selected will be thirty employed residents working within Barangay San Jose, Lipa City, Batangas, as their perception on the community cleanliness and productivity will be measured in the study. All selected respondents will be answering questionnaires, while another five of the thirty respondents will be randomly selected to participate in an online interview.

Also, the age and sex of the respondents will be considered in the data gathering procedure in order to assist in organizing and formulating the conclusion from the collected data. The respondents will be a mix of male and female employed residents from Barangay San Jose, Lipa City, Batangas, ranging from 18 years of age and above. Moreover, because of the broad range of age, the respondents will have a variety of experiences and behavior that can help in achieving the goal of the study.

Furthermore, the selection of respondents will be through purposive sampling in the variation of employed residents within Barangay San Jose, Lipa City, Batangas since they all have different perceptions of cleanliness and productivity rate, thus making the

research more reliable and helping researchers achieve the goal of their study. Also, the data results will be less biased when the respondents have different perceptions of cleanliness, productivity rate and when they are selected randomly.

**Locale Of The Study**

The locale is also an essential part of the study as it will discuss the place of the research, and it will help the researchers find the target population to be studied. The locale of the study will be found at Barangay San Jose, Lipa City, Batangas. It will be the chosen locale as the researchers will target the employed residents within the chosen community. Also, Barangay San Jose has a total population of 6,851 while having 1,343 households. Moreover, among the other communities, Barangay San Jose, Lipa City, Batangas is the chosen locale because improper waste management issues are more evident in the said place. Based on the previous assessment conducted with the residents and barangay officials, it is the most prevalent problem of the community due to a lack of awareness and information about the matter. In addition, the chosen community is located near a river that is currently polluted and cannot be a source of clean water due to many cases of Improper Waste Management. Furthermore, the residents have also admitted to burning trash, resulting in different health and well-being problems for the residents.

**Research Tools And Instruments**

Interviews will be the first type of research instrument that will be used by the researchers to have in-depth answers regarding their perception of cleanliness in their community. Given the situation of the pandemic, there are many health protocols needed

to be followed to assure safety, and the interview will be done online. Moreover, the interview will contain open-ended questions to know the perception of the cleanliness of the respondents, where it will consist of questions that will let the respondents have in-depth answers regarding the topic on hand. This gives the employed residents a chance to answer based on their opinion and experiences about the perceived effect of Waste-O on their perception of cleanliness in the community and to their productivity rate. Also, this enables the respondents to give more informative responses, which can further help the researchers learn more about the matter. For the sake of the data gathering procedure of the study, the online interview will be transcribed and recorded and will be used with confidentiality.

Moreover, another type of research instrument to be used in this study is survey questionnaires. As data-gathering procedures are limited because of the given health protocols mandated by the government, the researchers will formulate online questionnaires that will boost the collection of factual data, which will then be essential for the study. Additionally, the questionnaires formulated by the researchers will be approved questionnaires that the research proctors will check for the validity of the data collection, which means that the same questions will be asked to the employed residents of Barangay San Jose, Lipa City, Batangas. With this, the first part of the survey questionnaires will contain questions regarding the respondent's general information such as their name, age, sex, and job. In contrast, the second part will include close-ended questions to know the perception towards cleanliness of the respondent, where it will consist of questions that are answerable through a five-point Likert scale. Lastly, the third part will also include closed-ended questions to know the productivity

rate of the respondents, where it will consist of questions that are answerable through the five-point Likert scale.

**Data Gathering Procedure**

Before conducting the data gathering procedure, the researchers will prepare the necessary research instruments, such as Google Forms that will be used as questionnaires and Google Meet or Zoom rooms that will be used for interviews. The researchers would also seek permission from the barangay officials before conducting the data collection and respondents will be given a consent letter if they want to be part of the study. The research instruments will be distributed to residents within Barangay San Jose, Lipa City Batangas. Moreover, the process of creating and distributing multiple-choice questionnaires will be done through Google Forms, for this would allow a contact-free transfer of the necessary information from the respondents that are needed for the study. All of the gathered answers will be shown through a graph and tables, making it uncomplicated to reach a conclusive statement that would demonstrate that the hypothesis of the study is correct.

While gathering the quantitative and qualitative data needed for the study from the questionnaires, the researchers will also conduct online interviews with the same respondents through Google Meet or Zoom to gather the more necessary information needed for the study. Conducting both the interviews and questionnaires simultaneously can greatly help the researchers gain as much necessary information on the given amount of time for data collection, which is a great help in finishing the study on time.

**Procedure On Data Analysis And Interpretation**

With all of the relevant data collected for the study, researchers will be able to classify and separate quantitative and qualitative data for them to be interpreted separately. The quantitative data will be analyzed and interpreted by collecting the means of the collected answers to get the middle value on how the residents see a certain factor. With this, their perception of cleanliness will be known as follows: 1 - Very Dirty, 2 - Dirty, 3 - Uncertain, 4 - Clean, 5 - Very Clean, while their productivity rate will be known as follows: 1 - Very Low, 2 - Low, 3 - Neutral, 4 - High, 5 - Very High. Each question will require the proponents to get the average to get better results for the study.

Additionally, the qualitative data will be analyzed and interpreted via the Glaserian Coding, specifically open, selective, and theoretical codes, so that researchers will be able to identify the key points of the respondents line-by-line, making it easy to understand by the researchers. Finally, the statistical tool that will be used to interpret the data will be the Pearson r Correlation as this will help the researchers compare the relationship between the residential perception of cleanliness in the community and the productivity rate of the residents; in turn identifying whether the two said variables have a positive, negative or zero relationship.

**Ethical Considerations**

Throughout the whole research process, researchers will also follow different ethics in research such as complying with the Republic Act 10173 (2012 Data Privacy Act), objectivity, confidentiality, informed consent, recognizing the different work of other

writers, voluntary participation, and non-discrimination. Moreover, the aforementioned respondents of the research are the employed residents of Barangay San Jose, Lipa City, Batangas, wherein their participation will be only based if they are willing to become part of the research and their involvement may or may not benefit them. Also, an ethical code regarding non-discrimination will also be followed since the respondents' participation is one of the keys to successful research.

Additionally, respondents will be given informed consent so that researchers can request them if they want to participate and be part of the study. The informed consent will be given through a letter that tells respondents about the whole study being conducted, wherein it includes the purpose of the study, its whole procedure, possible risks that may occur through the study, and the benefits of the study. Respondents' contact information and their identity will also be given to the researchers for the reliability of the study, but it will remain confidential, and the letter containing the informed consent will be legally confirmed with the signature of both the respondents and researchers below the letter. Apart from that, researchers will use APA citation and in-text citations upon citing works of other authors that have been used throughout the whole research for proper referencing and recognition. Besides that, objectivity will also be used upon starting the study since its main objective is to recognize different information and data while analyzing observations and not through biased manners. It would be a significant part of the research as it is essential to find the necessary information needed in the study and for data and information collected to be valid. Lastly, the Data Privacy Act of the Philippines (Republic Act 10173) will be followed, where it is a law that aims to take care of all kinds of information, whether it may be private,

personal, or sensitive. Throughout the whole study, researchers will ensure that no one will be harmed and affected, and the whole process will have a safe atmosphere for both researchers and respondents.

## REFERENCES

Adams, H. (2019, October 28). Technological Influence on Society. Retrieved from https://www.bctv.org/2019/11/07/technological-influence-on-society/

Awan, T. (2020, November 17). Significance of technology in the modern world. Retrieved from https://www.technologytimes.pk/2020/11/17/significance-of-technology-in-the-modern-world/

Balińska, A., Jaska, E., Werenowska, A. (2021, October 12). The Role of Eco-Apps in Encouraging Pro-Environmental Behavior of Young People Studying in Poland. Retrieved from https://www.mdpi.com/1996-1073/14/16/4946

Barone, R. (2018, May 10). Benefits of Technology & the Right Kind of Screen Time for Children. Retrieved from https://www.idtech.com/blog/benefits-of-technology-for-children

Bassi, S. Christensen, T. H. Damgaard A. (2017). Environmental performance of household waste management in Europe - an example of 7 countries. Retrieved from https://core.ac.uk/reader/84595529?utm_source=linkout

Brown, S. (2020, April 22). 10 apps that help you be more sustainable in every area of life. Retrieved from https://www.cnet.com/tech/services-and-software/10-apps-that-help-you-be-more-sustainable-in-every-area-of-life/

Buabeng-Andoh, C. (2018). Predicting students' intention to adopt mobile learning. *Journal of Research in Innovative Teaching & Learning, 11*(2), 178–191. https://doi.org/10.1108/jrit-03-2017-0004

Bundhoo, Z. M. A. (2018). Solid waste management in least developed countries: current status and challenges faced. *Journal of Material Cycles and Waste Management, 20*(3), 1867–1877. https://doi.org/10.1007/s10163-018-0728-3

Crossman, A. (2020, March 19). Understanding Purposive Sampling. Retrieved from https://www.thoughtco.com/purposive-sampling-3026727

Di Lernia, D., Serino, S., Pezzulo, G., Pedroli, E., Cipresso, P., & Riva, G. (2018). Feel the Time. Time Perception as a Function of Interoceptive Processing. *Frontiers in Human Neuroscience, 12*. Published. https://doi.org/10.3389/fnhum.2018.00074

Draaisma, D. (2017). Perception: Our useful inability to see reality. *Nature, 544*(7650), 296. https://doi.org/10.1038/544296a

Dragani, R. (2019, November 18). The Effects of Improper Waste Disposal. Retrieved from https://sciencing.com/the-effects-of-improper-waste-disposal-13421035.html

Environment. (n.d.). In Merriam-Webster.com dictionary. Retrieved from https://www.merriam-webster.com/dictionary/environment

Fidelis, L. (2018, August 7). Six benefits of a clean and tidy workplace. Retrieved from https://www.fidelisgroup.co.uk/six-benefits-of-a-clean-and-tidy-workplace/

George, T. (2021, August 13). An introduction to mixed methods research. Retrieved from https://www.scribbr.com/methodology/mixed-methods-research/

Gottschalk, F. (2019, January 31). Impacts of technology use on children: Exploring literature on the brain, cognition and well-being. Retrieved from https://www.oecd-ilibrary.org/education/impacts-of-technology-use-on-children_8296464e-en

Higuchi, T., Giordani, M., Zanella, A., Zorzi, M., & Altintas, O. (2019). Value-Anticipating V2V Communications for Cooperative Perception. *2019 IEEE Intelligent Vehicles Symposium (IV)*. Published. https://doi.org/10.1109/ivs.2019.8814110

Honesty, F. F., Honesty, H. N., & Pebriyani, D. (2020). The Analysis of Accounting Students Perception to the Financial Statements Reporting. *Proceedings of the 4th Padang International Conference on Education, Economics, Business and Accounting (PICEEBA-2 2019)*. Published. https://doi.org/10.2991/aebmr.k.200305.054

Horrevorts, M., van Ophem, J., & Terpstra, P. (2017). Impact of cleanliness on the productivity of employees. *Facilities, 36*(9/10), 442–459. https://doi.org/10.1108/f-02-2017-0018

Idowu, O. (2018, May 17). Reasons why we should care about the environment. Retrieved from https://www.eraenvironnement.com/reasons-why-we-should-care-about-the-8927-environment/#sthash.MiE1yjO5.dpbs

Kalayou, M. H., Endehabtu, B. F., & Tilahun, B. (2020). The Applicability of the Modified Technology Acceptance Model (TAM) on the Sustainable Adoption of eHealth Systems in Resource-Limited Settings. *Journal of Multidisciplinary Healthcare, Volume 13*, 1827–1837. https://doi.org/10.2147/jmdh.s284973

Lai, P. (2017). THE LITERATURE REVIEW OF TECHNOLOGY ADOPTION MODELS AND THEORIES FOR THE NOVELTY TECHNOLOGY. *Journal of Information Systems and Technology Management, 14*(1). https://doi.org/10.4301/s1807-17752017000100002

Lin, S. Y., Juan, P. J., & Lin, S. W. (2020). A TAM Framework to Evaluate the Effect of Smartphone Application on Tourism Information Search Behavior of Foreign Independent Travelers. *Sustainability, 12*(22), 9366. https://doi.org/10.3390/su12229366

McCombes, S. (2019, September 19). An introduction to sampling methods. Retrieved from https://www.scribbr.com/methodology/sampling-methods/

Nagaraj, G. (2020, August 24). Impact of environment on human behavior. Retrieved from https://timesofindia.indiatimes.com/readersblog/impact-of-environment-on-human-behaviour/impact-of-environment-on-human-behaviour-25080/

Nathanson, J. (2020, November 10). solid-waste management. Retrieved from https://www.britannica.com/technology/solid-waste-management

Nuzrath, A., Ruzaik, F. (2017, November 29). Public Perceptions on Effectiveness of Solid Waste Management in Colombo Municipality Area. Research Gate. Retrieved December 8, 2021, from https://www.researchgate.net/publication/321330758_Public_Perceptions_on_Effectiveness_of_Solid_Waste_Management_in_Colombo_Municipality_Area.

Okafor, J. (2021, June 14). 13 Eco-friendly & sustainable living apps. Retrieved from https://www.trvst.world/sustainable-living/eco-friendly-apps/

Olivera, S. (2020, November 24). Impact of perception about leaders on employee work performance. Retrieved from https://www.linkedin.com/pulse/impact-perception-leaders-employee-work-performance-supreeta-olivera/

Omair, M., Ullah, M., Ganguly, B., Noor, S., Maqsood, S., & Sarkar, B. (2019). The Quantitative Analysis of Workers' Stress Due to Working Environment in the Production System of the Automobile Part Manufacturing Industry. *Mathematics, 7*(7), 627. https://doi.org/10.3390/math7070627

Perkins, C. (2021, April 28). 5 Mental health benefits of a clean and organized workspace. Retrieved from https://paintedbrain.org/news/5-mental-health-benefits-of-a-clean-and-organized-workspace/

Pham, L. (2021, November 30). Mobile application: definition, technology types And examples 2021. Retrieved from https://magenest.com/en/mobile-application/

Portz, J. D., Bayliss, E. A., Bull, S., Boxer, R. S., Bekelman, D. B., Gleason, K., & Czaja, S. (2019). Using the Technology Acceptance Model to Explore User Experience, Intent to Use, and Use Behavior of a Patient Portal Among Older Adults With Multiple Chronic Conditions: Descriptive Qualitative Study. Journal of Medical Internet Research, 21(4), e11604. https://doi.org/10.2196/11604

Poss, H. (2019, June 28). 3 Ways a clean workplace impacts productivity. Retrieved from https://www.actioncleanup.com/blog-4/3-ways-a-clean-workplace-impacts-productivity

Qiong, O. U. (2017). Studies in Literature and Language. *A Brief Introduction to Perception, 15(4)*. https://doi.org/10.3968/10055

Ramadhan, S., Sukma, E., & Indriyani, V. (2019). Environmental education and disaster mitigation through language learning. *IOP Conference Series: Earth and Environmental Science, 314*(1), 012054. https://doi.org/10.1088/1755-1315/314/1/012054

Reasons Why We Should Care About the Environment | ERA ENVIRONNEMENT. (2018, May 17). Retrieved from https://www.eraenvironnement.com/reasons-why-we-should-care-about-the-8927-environment/#sthash.7Wqbnq3I.k83LGcJi.dpbs

Redhwan Ahmed Al-Naggar, Mahfoudh A.M Abdulghani, & Mahmoud Abdullah Al-Areefi. (2019). EFFECTS OF INAPPROPRIATE WASTE MANAGEMENT ON HEALTH: KNOWLEDGE, ATTITUDE AND PRACTICE AMONG MALAYSIAN POPULATION. *Malaysian Journal of Public Health Medicine, 19*(1), 101–109. https://doi.org/10.37268/mjphm/vol.19/no.1/art.41

Ruliana, V., Soemantojo, R. W., & Asteria, D. (2019). Assessing a community-based waste separation program through examination of correlations between participation, information exposure, environmental knowledge, and environmental attitude. *ASEAN Journal of Community Engagement, 3*(1), 1–27. https://doi.org/10.7454/ajce.v3i1.120

Shobe, K. (2018). Productivity Driven by Job Satisfaction, Physical Work Environment, Management Support and Job Autonomy. *Business and Economics Journal, 09*(02). https://doi.org/10.4172/2151-6219.1000351

Shpak, S. (2019, March 4). How to calculate percent changes in productivity. Retrieved from https://smallbusiness.chron.com/calculate-percent-changes-productivity-10369.html

Sookngam, K., Wongchantra, P., & Bunnaen, W. (2021). The Effect of Environmental Education Training Course in Soil, Water and Forest Conservation on the Concept of The King Rama IX of Thailand. *International Journal of Higher Education, 10*(4), 32. https://doi.org/10.5430/ijhe.v10n4p32

Suttie, J. (2020, September 3). Eight ways your perception of reality is skewed. Greater Good. Retrieved from https://greatergood.berkeley.edu/article/item/eight_reasons_to_Distrust_your_own_perceptions

Suvorova, E. (2015). Psych 256: Cognitive psychology su 15. Retrieved from https://sites.psu.edu/pscyh256su15/2015/05/30/perception-and-everyday-life/

Tater, M. (2019, June 17). 7 Ways A Clean Workplace Affects Your Employees Performance. Retrieved from https://www.entrepreneurshiplife.com/7-ways-a-clean-workplace-affects-your-employees-performance/#1_It_can_boost_morale

The World Bank. (2018). Trends in solid waste management. Retrieved from https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

Twedt, E., Proffitt, D. R., Twedt, E., Proffitt, D. R., Twedt, E., & Proffitt, D. R. (2013). Perception. *Oxford Bibliographies Online Datasets*. Published. https://doi.org/10.1093/obo/9780199828340-0119

World Bank. (2019, September 23). Solid Waste Management. Retrieved from https://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management

Vos, M. C., Galetzka, M., Mobach, M. P., van Hagen, M., & Pruyn, A. T. (2018). Cleanliness unravelled: a review and integration of literature. *Journal of Facilities Management, 16*(4), 429–451. https://doi.org/10.1108/jfm-06-2017-0025

Yukalang, N., Clarke, B., & Ross, K. (2017). Barriers to Effective Municipal Solid Waste Management in a Rapidly Urbanizing Area in Thailand. *International Journal of Environmental Research and Public Health, 14*(9), 1013. https://doi.org/10.3390/ijerph14091013