FACULTY OF TECHNOLOGY MANAGEMENT AND TECHNOPRENEURSHIP

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

THE IMPORTANCE OF GREEN UNIVERSITY ADOPTION TO IMPROVE ENVIRONMENT IN UTEM (UNIVERSITI TEKNIKAL MALAYSIA MELAKA)

MUHAMMAD ASYRAF BIN SHAMSUDIN

BTMI SECTION 2/2

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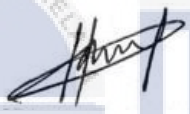
"I hereby declared that I had read through this thesis and in my opinion that this thesis is adequate in terms of scope and quality which fulfil the requirements for the award of Bachelor of Technology Management Innovation."

Signature : 

Name of Supervisor : DR HAZMILAH BINTI HASAN

Date : 30/1/2023

Signature : 

Name of Supervisor : DR NABIL HASAN SALEH AL-KUMAIM

Date : 30/1/2023

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Report submitted in fulfilment of the requirements for the Bachelor Degree of Technopreneurship

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DECLARATION

"I declare that this project is the result of my own research except that is cited in the references. The research project has not been for any degree and is not concurrently submitted in the candidature of any other degree."

Signature :
Name : MUHAMMAD ASYRAF BIN SHAMSUDIN
Date : 20/06/2022

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ABSTRACT

In light of growing global issues such as climate change, population growth, environmental degradation, and inefficient use and depletion of natural resources, countries must employ environmentally friendly technology and methods to economic activity, particularly beginning at the bottom, which is educational institutions. Natural resource depletion, overpopulation-caused climate change, and the fast economic ascent of new industrial countries, particularly Malaysia, are widely regarded as having significant environmental repercussions. This article mainly highlights the importance of green technology adoption to improve environment in UTEM. This study applied quantitative research and data was collected using a questionnaire that has been distributed randomly selected by 200 respondents.

KEYWORDS: Green Technology, emerging, environment, UTEM

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CHAPTER 1

INTRODUCTION

1.1 Background of study

In view of expanding global issues such as climate change, population increase, environmental degradation, and inefficient use and depletion of natural resources, countries must utilise environmentally friendly technology and methods to economic activity especially starting from the bottom which is starting from educational institutions. Threats such as natural resource depletion, climate change caused by overpopulation, and the accelerated economic rise of new industrial countries, particularly Malaysia, are widely acknowledged as having negative environmental consequences.

Green Technology works to lessen toxicity in nature by either counteracting it or changing the conditions that cause it. This can result in environmental, economic, and ecological equilibrium. It contributes to the reduction of greenhouse gas emissions and the depletion of the ozone layer, both of which contribute to global warming. Every day, it becomes clearer that we must spend more on green solutions for humanity's existence, and the importance of green technology rests in lowering environmental dangers and conserving natural resources.

1.2 Problem Statement

Recycling, renewable resources, health and safety concerns, energy efficiency, and other aspects of green technology are examples. Green technology provides people with hope that pollution and the effects of climate change can be reversed. Firstly, the problem for implementing green university is Malaysia did not have a proper technology that can develop green technology. As we know, Malaysia is a developing country. In this case, our country is not a country that exports technology because Malaysia takes technology from other countries. To develop local technology in order to sustain national competency, Malaysia is shifting towards becoming a knowledge-based economy after the launch of the long term policy plan

(Suzana, 2013). However, Malaysia is still a long way to develop or create its own technology. Due to that, our country does not have proper technology that can develop green technology on its own.

Next, the problem of green university adoption is because pollution from industrial sector. Pollution is a global phenomenon that has been demonstrated to be responsible for innumerable untold harm to the environment and ecosystem at large, resulting in global warming, climate change, ecosystem deterioration, and resource shortages. With a contribution rate of 61 percent**,** industrial activities have been proven to be a major contributor to the global threat of environmental pollution. Pollution as an entity is seen by many scholars because of industrialization and economic development, and numerous attempts have been made to clarify and explain the relationship that exists between pollution and industrialization (Asici, 2015). Developing countries such as Malaysia have an impact on the industrial sector, but they also endanger the natural environment or cause biodiversity loss. Industrial operations have a negative impact on the ecosystem, causing environmental degradation, which is a major concern today. Significant efforts have been made to minimise pollution, but there is still a need for a solid monitoring system, policy implementation procedures, and the development of green technologies.

Furthermore, financial factors also become a problem to develop or green university adoption. Developing a country with strong science and technology background requires heavy investment in research and development (R&D) activity (Suzana, 2013). A considerable amount of money is required to create or develop new green technology. Similarly, if an organization or government wishes to import technology from another production country, substantial funds are required. This issue can be solved if our country or educational institution produces green technologies. Nonetheless, because the government must issue enormous budgets, financial concerns can be a serious difficulty.

Beside, less awareness that can push or motivate the knowledge to implement green university can be part of the problem. The main thrust in the Green Technology sector is to provide education and public awareness on green technology as well as to promote the widespread use of green technology (KeTTHA, 2019). Organizations should raise awareness of green practices to ensure that people have a basic understanding of them. However, the application of green practices may complicate the process and necessitate a learning and training programmed. As a result, the effectiveness of the organization's training programmed

will increase green practices among them. Knowledge of green practices has been an important aspect in implementing green practices. A pro-environmental approach necessitates student knowledge and abilities to elicit emotional involvement in green practices. Another expert noted that to achieve the desired environmental performance, students must have the necessary skills and knowledge, because a lack of knowledge leads to failures in the adoption of green practices.

Finally, why I choose this research in UTEM is because the unplanned management of natural resources in UTEM such as the release of carbon dioxide gas into the atmosphere, the disposal of solid waste and so on causes pollution. If the management of these natural resources is not managed well, it also affects the quality of life of students and staff and the environment at UTEM.

1.3 Research Question

1. What is the level of UTEM students' knowledge regarding green technology?
2. What are the advantages and disadvantages of implementation or emerging green technology?
3. What activities can be done to make UTEM a safe environment using green technology?

1.4 Research Objective

1. To study the level of knowledge of UTEM citizens about green technology.
2. To investigate the advantages and disadvantages of using green technology.
3. To examine what activities can be done to make a safe environment using green technology in UTEM

1.5 Research Scope

This study will discuss the level of knowledge of UTEM student

1.6 Limitation/Key Assumptions of the Study

The researcher face constraint in term of data obtained from respondent. This is because the researcher was not able to check whether respondent provided the honest answer. Besides, respondent know or understand about topic of the study.

1.7 Important of the Study

The purpose of this study is to create awareness on how the green technology can give a lot of benefit to the people. Green technology is one of the factors that can help to reduce environmental degradation and promote a healthy environment. Furthermore, green technology should be used in the field of education to teach in students an appreciation for the environment.

1.8 Summary

This chapter describes the fundamental understanding of how to do this research study. This chapter briefly provide guidelines for further explanation about background of the study, problem statement, research question, research objective, the scope of study, limitation and important of the study. This study can help people to gain more knowledge about the importance of emerging green technology.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter deals with the assessment of literature which relates to the topic of the research which is the importance of emerging green technology to improve the environment in UTEM. Several literatures would be selected, and relevant areas would be reviewed. In this chapter, the researcher will define the meaning of green technology, identify important emerging green technology, investigates what environment that use green technology, reviewing issue pertaining to green technology and solution to emphasis on the use of green technology. This chapter provides information about aspects of previous works which related to this study. In other words, several presentations culled from various sources are under review here.

2.1 Green Technology

Our earth is suffering from terrible repercussions, most of which are the result of human activity. The development of sustainable technology becomes critical and could have a positive impact on the environment if green technologies are made available to everyone on the planet.

The term technology typically refers to the use of diverse techniques, skills, procedures, and processes for all practical reasons or to attain specific goals such as scientific exploration or research. Green Technology, or Green Tech for short, is a technology that is ecologically benign in its manufacture, supply chain, or use. Green tech is an umbrella term that continuously develops products, systems or equipment which are less taxing to the natural environment and its resources which limit and diminishes the negative effect of human exercises (Wahid Ali, 2020). Another definition of green technology can be defined as one application, equipment or system that has characteristics that prioritize the preservation of the surrounding environment and are environmentally friendly (Rahman H A, 2017). The existence

of green technology is built on human consciousness to preserve ecological sustainability, which influences human life sustainability.

Green technology has so far been underutilised, particularly in underdeveloped nations such as Malaysia. There are numerous causes that have led to the optimal use of green technology, ranging from technical considerations such as costs to more basic matters such as public awareness of the necessity of environmental protection. As a result, it is critical to expose green technology to the community at an early age, for example, through green ethos education events for university student.

Green technology is carried out by applying a "green concept" which contains aspects of ZEB (Zero Energy Building) and 3R (Reuse, Reduce, Recycle) (Pambudi G, 2015). The characteristics of Green Technology include sustainable, using reclaimed natural resources, producing products that can be reused, reducing waste products and pollutants, and can be used in the recycling process (recycle), innovative and not harmful to health and the environment, creating activities and products that are beneficial to the environment and can protect the earth (Nefilinda, 2014).

The primary purpose of developing Green Technology is to limit climate change, conserve the natural environment, reduce our reliance on non-renewable resources such as fossil fuels, and repair environmental damage. The world's natural resources are finite, with some already depleted or damaged. Household batteries and gadgets, for example, can contain hazardous compounds that can pollute groundwater after disposal, poisoning our soil and water with substances that cannot be removed from drinking water and food crops produced on polluted soil. The dangers to human health are enormous. As a result, it is imperative that every investor consider becoming green. They should understand that green inventions technology is profitable.

2.2 Important green technology adoption

From Cambridge Dictionary, it is stated that the word of adoption is define as accepting or starting to use something new. Based on the meaning of the word, the term of accepting is used as the basis for the emphasis on the use of green technology. The adoption of green technology phrase points to the beginning that today's world needs green technology. Adoption of a new technology or technologies may provide benefits which may not be internalized by the agents making the adoption decisions. Possible examples include

safer equipment and processes for both manufacturing and service firms, as well as the purchase of environmentally friendly goods such as vehicles and appliances in the realm of consumer products. In such cases, the firms producing such products as well as the firms or consumers adopting the products must be aware of the regulatory environment (Bryan K.B., 2011)

The active use of green technology can help significantly reduce pollution (Ashyl Dasy, 2020). As a result, both developed and developing countries are turning to this type of technology to help them preserve the environment from harmful repercussions. Although pollution is an old problem, green technology adoption is a relatively new concept. It is growing increasingly popular as people realise that we are truly killing our planet. It has become critical to maintain our world, and green technology adoption is unquestionably more than a passing fad.

New technologies are crucial in dealing with the problem of air and water pollution, which is an increasingly important issue with serious health and environmental consequences. However, adoption of environmentally friendly technologies can be slow if the new technologies are not superior in terms of the firms' private incentives, if firms have long equipment replacement cycles, or if firms do not have sufficient information to evaluate whether or not a switch to a green technology is in their private interests (Bryan K.B., 2011).

2.3 Environment that use green technology

Everything that surrounds or affects an organism during its lifetime is referred to as its environment, or simply everything that surrounds a living organism such as people, places, and things, which can be either natural or synthetic. The word environment is derived from the French word 'environner,' which means to encircle or surround. The environment is believed to be an inseparable whole composed of interacting systems of physical, biological, and cultural factors that are interconnected individually and collectively in a variety of ways. Physical components (space, landforms, waterbodies, climate, soils, rocks, and minerals) influence the varied character of the human environment, as well as its opportunities and constraints. The biosphere is made up of biological elements (plants, animals, microorganisms, and humans).

From the above description, we can understand that the interaction between life with other biological elements can be considered as an aspect in the environment. An unpleasant environment makes the interaction between living things and biological elements unbalanced.

Pollution is one of the essential elements that cause the environment to be bad and requires the use of green technology as a solution.

National Geographic define pollution as introduction of harmful materials into the environment. Pollutants may be naturally occurring, such as volcanic ash. They can also be caused by human activities, such as factory runoff or waste. Pollutants have a negative impact on the quality of the air, water, and land. From single-celled microorganisms to blue whales, all living creatures rely on Earth's supply of air and water. When these resources are contaminated, all kinds of life are jeopardised. Pollution is a worldwide issue. Although metropolitan regions are typically more polluted than rural ones, pollution can migrate to isolated locations where no people dwell. Air pollution, water pollution, and land contamination are the three major types of pollution. This polluted environment makes the use of green technology necessary in daily life to save the existing environment.

Polluted environment also occurs in educational institutions as well as in universities in Malaysia. The management of the university has highlighted the importance of green technology as a measure in conserving and preserving the environment for the comfort of its students. Through an article published by Ruwaida in 2019 in Berita Harian, Universiti Teknologi MARA (UiTM) has collaborated with Sunway University's Nano-Materials and Energy Technology Research Centre (RCNMET) to develop green technology based on nanocomposite polymers. The collaboration involves environmental conservation efforts through the use of solar energy -based green technology in the degradation of less hazardous materials. The production of nanocomposite polymer materials can also be used in the production of hydrogen gas as an alternative energy source in the future as an effort to reduce carbon production (Ruwaida, 2019).

In addition, according to Asrizam, the rising ambient temperature has led to the high use of air conditioners and fans in the community to reduce the effects of this heat. This factor also results in an increase in electricity consumption in a building, especially in Universiti Putra Malaysia (UPM). New innovations have been produced by a group of researchers from the Institute of Advanced Technology (ITMA) at Universiti Putra Malaysia (UPM) to overcome this problem. Nano Phase Change Material (Nano PCM) has been developed which can help cool the building temperature and in turn can reduce the use of air conditioning, thus saving electricity costs (Asrizam, 2022). UTEM, which is notorious for odor pollution caused by chicken coops in the surrounding area, has lowered air quality and provided discomfort to students. UTEM needs to solve this problem by developing green technologies that can

overcome this problem. This is very important to ensure that the environment in the UTEM area is always protected and not polluted.

2.4 Issue pertaining to green technology

Increased material and energy efficiency in existing manufacturing processes, for example, are critical components of the shift to a green technology. However, more significant, if not radical, technological innovation is required. For instance, replacing fossil fuels in the transport sector as well as in iron and steel production requires fundamental technological shifts and not just incremental efficiency improvements (Nilsson LJ, 2017).

The issue for pertaining to green technology is new green technologies frequently face unfair competition from incumbent technologies. The incumbents, which may be close equivalents for their greener competitors, will have a relative competitive advantage because they were permitted to expand during periods of less stringent environmental rules, as well as tailor-made institutions and infrastructures. This results in path-dependence, or the economy becoming locked into specific technology trajectories. When developing new goods and processes, corporations often use acquired technology-specific knowledge, and technological decisions tend to be particularly self-reinforcing if the investments are defined by high initial costs and increasing returns from adoption. Existing institutions, such as regulations, norms of conduct, and so on, may also contribute to route dependence because they frequently favour incumbent technologies.

2.5 Solution on how to increase on protecting environment using gap analysis

Through observations or studies from environmental experts, they unanimously agree that the use of green technology is highly encouraged in caring for the environment, especially in preventing pollution. This can be assessed based on gap analysis that can help influence the use of green technology.

Gap analysis is either a tool or a process to identify where gaps are and what differences exist between an organization's current situation and "what ought to be" in place (Sora Kim, 2018). The gap analysis results show crucial areas where managers should take action to close the gaps and provide an objective and detailed view of the direction and magnitude of gaps among affected constituents. Based on the definition, this gap analysis can give us an idea of how much we need the use of green technology.

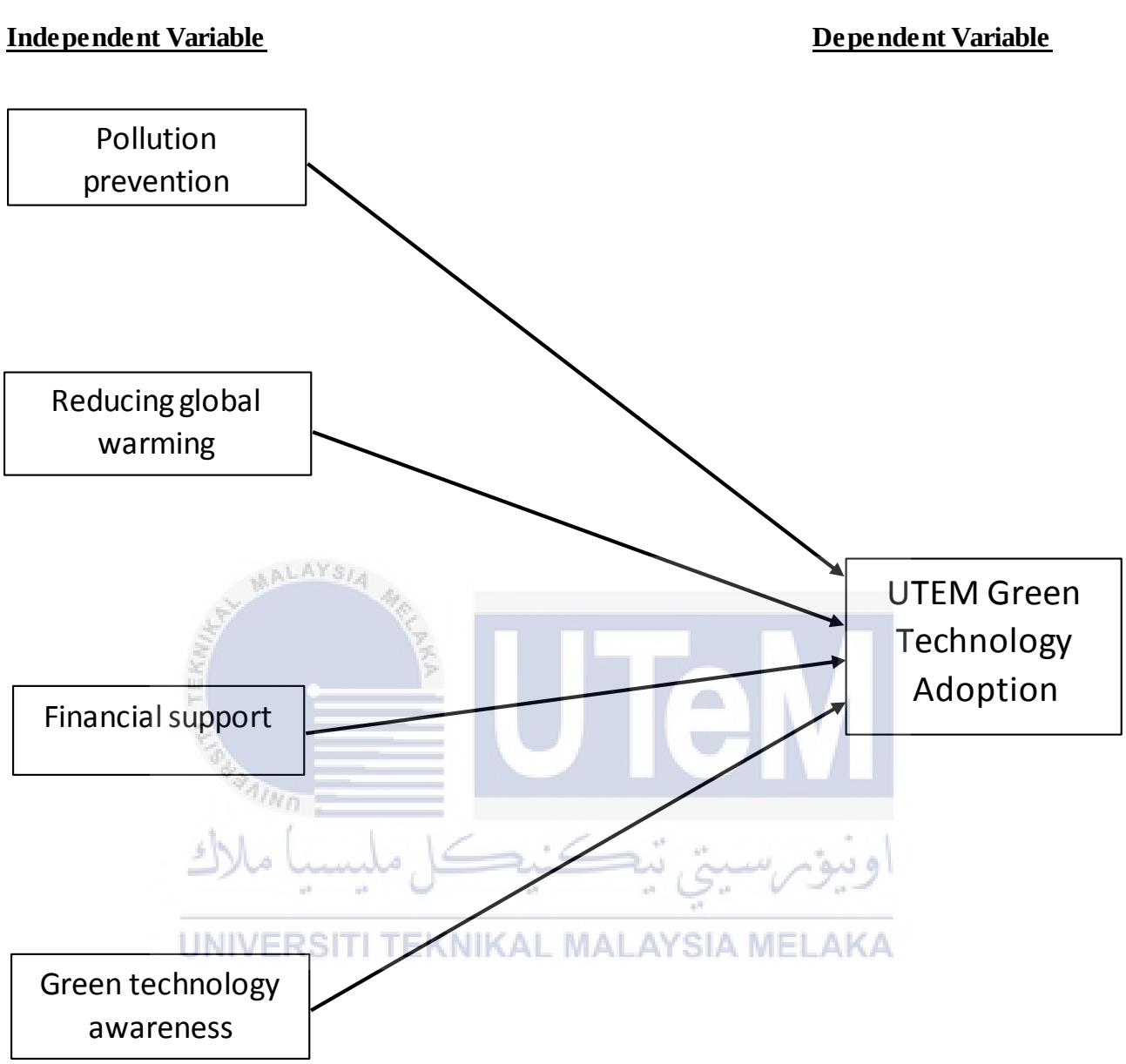
Firstly, the strength of using green technology. Using green technology, we can get energy saving from the implementation of the technology. One advantage of environmental technology is that they allow us to conserve a significant amount of energy. For example, by manufacturing more energy-efficient items, we must consume less energy in all aspects of our everyday lives.

Next, the opportunities using green technology. The green technology can give opportunities on how to increase recycling among people. Recycling aims to conserve scarce resources by recycling items or developing environmentally friendly substitutes. While the most common types of recycling are plastic, glass, paper, and metal waste, more sophisticated techniques can be utilised to recover valuable raw materials from e-waste or vehicle parts.

Furthermore, the weakness of green technology. The greatest weakness of green technology is that it frequently requires a large initial investment. Installing a new roof or new insulation to minimise heat from fleeing your home, for example, would be considered a green home improvement, but the work would be expensive.

Finally, the threat of use green technology which is lack of knowledge about green technology. Lack of knowledge about technology can be a threat to the implementation of green technology. This is because people do not know that how effective it is to the environment if using green technology. Exposure to this green technology is needed to influence people to use more green technology in their daily lives.

2.6 Conceptual Framework



2.6.1 Dependent Variable

The dependent variable is the one that changes as a result of the independent variable's modification. It is the outcome that you wish to quantify, and it is "dependent" on your independent variable.

2.6.1.1 UTEM Green Technology Adoption

To adopt green technology in UTEM is one effort so that all the faculties, staff members and students can join such an effort. As the cradles of educating “future leaders”, universities should address various needs of local societies. With the increasing concerns on different environmental issues and more recently a need to respond climate change, universities should create knowledge and integrate sustainability in educational and research programs, as well as promoting environmental issues to the society. Under such a circumstance, green university efforts have been initiated worldwide (Yong Geng, 2012).

There is need for higher education institutions (HEI) to implement Green initiatives in supporting sustainability attainment for waste decrease, energy efficiency, water utilization reduction, healthy working surroundings as well as clean indoor air (Sonetti et al., 2016). These initiatives can bring about improved quality of life for all, better economic vitality and a reduced environmental footprint (Mat et al., 2011). Higher education institutions are similar to smaller cities in terms of urban characteristics and population size. Besides, several activities take place across the campuses, which possess direct or indirect impacts on the natural environment (Alshuwaikhat and Abubakar, 2008). Hence, it is required for practitioners in higher education institutions to implement Green practices, where these practitioners can assist in providing multidisciplinary Green technical solutions in achieving sustainable development within the university (Zakaria et al., 2016).

2.6.2 Independent Variable

An independent variable in an experimental study is a variable that is controlled or modified to observe what effects it has. It's called "independent" because it's unaffected by the other variables in the study.

2.6.2.1 Pollution prevention

Pollution is an unfavourable alteration in the physical, chemical or biological characteristics of air, water and land that may or will adversely affect human life, industrial life, industrial progress, living conditions and cultural assets (Abhijit Mitra, 2018). The major goal of green technology is to reduce the greenhouse effect and pollution. The main idea is to create revolutionary inventions that do not deplete natural resources. It will cause less harm to humans, animals, and the overall health of our world. Our world is clearly beginning to suffocate as a result of all the pollution that we produce. However, if there is a will, there is a way to make this difficulty considerably smaller. Day after day it is getting more obvious that we need to invest more in green solutions for the survival of mankind and the necessity of green tech lies in reducing the risks posed to the environment and in conserving natural resources (Mariya Noor, 2020). The successful application of green technologies will make a significant contribution to pollution reduction. This is why many developed and developing countries are now shifting to this type of technology to help safeguard people from the negative effects of climate change. Air quality is very important because the air we breathe must be fresh and clean. The air quality available at UTEM may not reach the actual quality because there is odor pollution released through the chicken coops around the UTEM area. The pollution may not be as big as other pollution, however, it disrupts the comfort of students living in the UTEM area. With this green technology, a little will reduce the smell and further improve the air quality in the UTEM area.

2.6.2.2 Reducing global warming

Global warming begins when sunlight reaches the Earth (Umair Shahzad, 2015). Because global warming is one of the most serious problems that humanity faces today,

everyone should take steps to mitigate climate change. Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate (Masson, 2019). Student residences at UTEM often receive a lot of heat as a result of this global warming. Plus, even during the night, the staying students will also experience heat that may not provide comfort when students want to sleep or rest. Green technology can assist us in this endeavour because they can save a significant amount of energy. Because the majority of our energy is still produced from fossil fuels, reducing energy usage also reduces the amount of fossil fuels that must be used. As a result, less greenhouse gases are emitted into our atmosphere, and global warming can be delayed to some extent.

2.6.2.3 Financial support

Perhaps the greatest disadvantage of going green is that it often requires a large initial cost (Mahmood Zohoori, 2017). Upfront costs present a large deterrent to going green (Mohammad, 2017). Installing a new roof or new insulation to keep heat from escaping your home would be considered a green home improvement, but it would cost a large sum of money to get the work done. Similarly, buying a hybrid vehicle that gets good gas mileage can reduce energy consumption, but hybrid vehicles often cost many thousands of dollars more than similar vehicles without hybrid technology (Abolfazl, 2017). One issue with environmental technology is that it is relatively new, and large funds must be spent on research and development in order to employ this type of technology on the scale required to have a meaningful environmental impact. As a result, organisations like UTEM must invest substantial sums of money up front, which may hinder and slow the development of sophisticated green technology to some extent. Not only can the expenses of researching green technology be high, but so can the price of implementing them.

2.6.2.4 Green technology awareness

Many people may still be unaware of our environmental concerns and the importance of developing solutions to them. The management should be proactive about the environmental

initiative but for that, awareness, education is important (Ong Tze San, 2020). Creating awareness of green technology and its practice to employees can increase knowledge and reduce the negative impact on the environment (Haslinda Musa, 2017). Understanding which awareness of green practice determinant effect on implementation on it. The individual knowledge gives organization concerns about green practices that implemented in the current practices (S.Fam, 2017). Individuals may simply not comprehend why they should utilise green technology items and may be unwilling to spend additional money for them if they don't have knowledge about it. People's knowledge of green technology and its practises can be increased, and the negative influence on the environment can be reduced. Similarly with UTEM, the lack of information about green technology makes students not care about how green technology can change a person's life and can preserve the environment.

2.7 Hypothesis of study

According to the proposed study framework (shown above), a variety of hypotheses could be developed. The following were the hypotheses:

Pollution prevention

H1: Pollution prevention has a significant influence on UTEM green technology adoption

Reducing global warming

H2: Reducing global warming has significant influence on UTEM green technology adoption

Financial support

H3: Financial support has significant influence on UTEM green technology adoption

Green technology awareness

H4: Green technology awareness has significant influence on UTEM green technology adoption

2.8 Summary

The theoretical underpinning for advantages and disadvantages of using green technology such as prevent from pollution, reducing global warming, large of fund needed to develop green technology and lack of knowledge about green technology is described above. The researcher defined the research process in this chapter by emphasing the pros and cons about green technology. The researcher designed hypothesis testing methodologies to evaluate the relationship between these independent and dependent variables.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This chapter will concentrate on the research method that will be used to carry out the research objectives. The method of data analysis will be determined by the method of data collecting used in the research. The research methodology is primarily utilised as a strategy for gathering and analysing data. As a result, this study would involve research design as well as research strategies. This research will also offer the research procedure as a clear process flow of the investigation. The goal of this chapter is to explain the process structure and data approach method. The process for obtaining data is data collection and sampling.

3.1 Research Design

The study will employ a descriptive research approach, namely a survey method. The survey approach is based on questioning respondents about a subject or subjects and then documenting their replies. The survey approach of primary data collection is used in business studies to test concepts, reflect people's views, measure the level of customer satisfaction, conduct segmentation research, and for a number of other purposes. The survey approach has the advantage of making it simple to collect and analyse primary data.

According to Jahoda, Deutch & Cook, a research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy and procedure (Ahuja Ram, 2010). The study employed credible database sources to execute experiments in order to discover as many primary papers relating to these research challenges as feasible. Experiments include randomly assigning people to different treatments or settings, and they provide the maximum control for distorting effects from outside influences.). It is also a quantitative research in which we may acquire practical ideas on how to handle problems using statistical data.

3.2 Methodological choices

Methodological choices for research design include quantitative, qualitative, and mixed techniques. The quantitative method typically employs a questionnaire for data collection and graphs or statistics for data analysis, both of which create or use numerical data. While the qualitative method employs interviews in data collection and classifying data in data analysis, it generates or uses non-numerical data.

In this study, the researcher used a quantitative method to investigate the relationship between the variables. This method measures and analyses the independent and dependent variables using a variety of statistical and graphical tools. In general, quantitative research is related with the deductive approach, which emphasises the use of data to test hypotheses. To collect quantitative data, you will often need to use operational definitions that translate abstract concepts into observable and quantifiable measures (Prita Bhandari, 2021). As the association is already established, the researcher will reconfirm whether or not the radical relationship exists.

3.2.1 Quantitative

Quantitative research is regarded as the organized inquiry about phenomenon through collection of numerical data and execution of statistical, mathematical or computational techniques. The source of quantitative research is positivism paradigm that advocates for approaches embedded in statistical breakdown that involves other strategies like inferential statistics, testing of hypothesis, mathematical exposition, experimental and quasi-experimental design randomization, blinding, structured protocols, and questionnaires with restricted variety of prearranged answers (Lee, as cited in Slevitch, 2011). The purpose of quantitative research is to attain greater knowledge and understanding of the social world. Researchers use quantitative methods to observe situations or events that affect people (Mike Allen, 2017).

3.3 Primary and Secondary Data

Primary data are the collected data by the researcher through surveys, interviews, or experiments specifically for the research problems that is being studied (Ghauri et al., 2020). The surveys are distributed by the researcher to the respondents. Respondents were asked to answer questions about their demographics, awareness and knowledge and their action.

Secondary data are the data that have been collected by government agencies, market research agencies, firms, or other organization or individuals and which are publicly available (Ghauri et al., 2020). These data sources are both cost and time effective. The researcher obtained secondary data from a website and a library database in order to choose acceptable journals, articles, reports, and newspapers as data sources for this study. The researcher gained the data from the books, such as "Emerging Green Technology" by Matthew N. O. Sadiku and " Green Technology and design for the environment" by Samir B. Billatos.

3.4 Data Collection

Data collection refers to the systematic gathering and examination of data on variables of interest by researchers in order to answer research questions, test hypotheses, and assess outcomes. The researcher will gather the replies from the surveys and the percentage from the awareness training to measure the outcomes. Any interpretation of the data is purely based on what participants said in their questionnaires, and the researcher's job is to find out what the participants are attempting to figure out. During the requirements gathering phase, researchers investigate the roles and goals of your target audiences in order to establish functional and usability goals for the application or website. The vast majority of secondary data sets are quantitative in nature, consisting of examined objects with properties recorded in variables with a range of possible values (HR Boeije 2005).

3.5 Research Location

The questionnaire method will be employed to collect data for this study's quantitative investigation. UTeM, Malacca, has been chosen as the research site, and data will be collected from UTeM students there. They will respond to the questionnaire with responses related to the study's objective.

Figure 3.1 University Teknikal Malaysia Melaka

3.5.1 Population / Sample

A population distribution expresses the frequency with which the units of analysis or cases that comprise a population are observed or expected to be observed in the various groups or categories that comprise a variable. The researcher choose UTeM student as the population for this study. The target population of this study is the FPTT year 3 student which is 200 respondents so based on sample size table (Table 3.1), there are required 132 students for this study. The reason is the researcher want to know the knowledge about green technology among UTeM student. This is because it relate to research project topic which is The Important of Emerging Green Technology to Improve Environment in UTEM.

3.5.2 Sampling

A sample distribution describes the frequency with which the units of analysis or instances that make up a sample are actually seen in the various groups or categories that make up a variable. When a researcher does research on a group of people, it is uncommon for data to be gathered from each individual in that group. Instead, the researcher selects a sample. The sample size is the number of persons who will participate in the study.

Researchers must carefully evaluate how they will select a sample that is representative of the total population in order to draw meaningful inferences from the data. Probability sampling and non-probability sampling are the two types of sampling procedures. Probability sampling involves random selection, which allows researchers to make strong statistical inferences about the entire group, while non-probability sampling involves non-random selection based on convenience or other criteria, which allows researchers to collect data quickly (Shona McCombes, 2019).

The growing requirement for a representative statistical sample in empirical research has created a need for an efficient technique of estimating sample size. To fill this void, Krejcie and Morgan (1970) developed a table for estimating sample size for a given population for simple reference.

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Table 3.1 : Table for Determining Sample Size for a Finite Population

The Table 3.1 is constructed using the following formula for determining sample size:

Formula for determining sample size

$$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Source: Krejcie & Morgan, 1970

3.6 Research Instrument

A research instrument is any tool that can be used to collect or obtain data, measure data, or analyse data related to the subject of your research.

3.6.1 Research Strategy

Research strategy provides overall direction of the research including the process by which the research is conducted (Wedawatta, 2011). According to Saunders et al. (2009), the right research method should be chosen based on the research questions and objectives, the degree of current knowledge on the topic area to be explored, the amount of time and resources available, and the researcher's philosophical underpinnings.

3.6.2 Questionnaire Design

A questionnaire is a collection of questions to be asked of survey respondents, together with instructions on which questions to ask first and in what order. Questionnaires are used in many different types of research, including survey research and experimental design. Sections A, B, and C of a questionnaire serve four functions. The following provide explanations for those sections:

Section A	Demographic profile of respondent • This section used to find out of respondent (gender, age, marital status, year of study, green technology knowledge) • The questions is based on nominal scale
Section B	The advantages and disadvantages of using Green Technology • This section of questionnaire is construct to identify the advantages and disadvantages of using green technology • The question is based on 5-likert scale
Section C	What activities can be done to make a safe environment using green technology in UTEM • This section of questionnaire is related to what type of activity to create a safe environment using green technology • The question is based on 5-likert scale

All aspects were evaluated using a closed-ended question and a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) (strongly agree). Evaluators may employ a variety of tools to aid with data collection. One of these methods is to use a scale. One of the most prevalent scale types is the Likert scale. A Likert scale is frequently used to measure attitudes, knowledge, perceptions, values, and behavioural changes.

← Strongly disagree				→ Strongly Agree
1	2	3	4	5

Table 3.1 Sample of 5-Likert scale

3.7 Validity and Reliability

A research study's validity refers to how closely the findings among study participants reflect true findings among similarly situated individuals outside of the study. Validity refers to all sorts of clinical research, including those examining prevalence, relationships, therapies, and diagnoses. Internal and external validity are two domains that make up the validity of a research study (J Bras Pneumol, 2018). He went on to say that it's critical to comprehend several crucial aspects of validity. For starters, there is validity in context. For one intended use, a test may have a high level of validity, but for another, it may have a lower level of validity. Second, validity is a continuum rather than a "all or nothing" proposition. Finally, validity is linked to a multi-dimensional process and the accumulation of evidence over time.

Replication and consistency are two aspects of reliability. If a researcher can duplicate a previous study design and come up with the same results, that research is considered credible (Saunders et al., 2016). There will be certain dangers to the reliability results, such as participant error, participant bias, researcher error, and researcher bias. According to Saunders et al. (2016), Cronbach's Alpha was used to quantify the variables' dependability the alpha coefficient ranges from 0 to 1. Cronbach's Alpha levels of higher than 0.7 and less than 0.8 are considered acceptable. If the value is greater than 0.9, it is called excellent, and if the value is greater than 0.8 but less than 0.9, it is good. When Cronbach's Alpha is less than 0.7, it is considered questionable, less than 0.6 is poor, and less than 0.5 is unacceptable.

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Table 3.2: Cronbach's Alpha Table (Saunders et al., 2016)

3.8 Statistical Analysis of Data

Survey resource requirements, data analysis, and effective results reporting are all important components of a genuine and successful survey. A data analysis is a systematic collection of mathematical, statistical, and/or logical methods for describing, demonstrating, summarising, and analysing data. Many experts analyse statistical data using the Statistical Package for the Social Sciences (SPSS). SPSS is a software package for data management and statistical analysis that is commonly used in the social sciences. In this study, descriptive analysis, a method for objectively defining the kind and amount of sensory qualities, may be used to perform the survey and questionnaire (SE Kemp, M Ng, T Hollowood 2018). The data will be interpreted using mean, frequency counts, range, and percentage. While the Chi-square test of independence will be used to investigate the relationship between independent and dependent variables.

3.8.1 Descriptive Analysis

Descriptive Analysis deals with describing a phenomena that how we think something is. It attempts to examine the situations in order to describe the norm (Waliman, 2011, P.10). Descriptive Analysis examines what exists and attempts to prepare the way for the discovery of new facts. It entails acquiring data about things, people, individuals, events, and circumstances and then organising, tabulating, depicting, and describing the output.

3.8.2 Person Correlation Coefficient

Pearson correlation measures the existence (given by a p-value) and strength (given by the coefficient r between -1 and +1) of a linear relationship between two variables. It should only be used when its underlying assumptions are satisfied. If the outcome is significant we conclude that a correlation exists (Peter Samuels, 2014). According to Cohen (1988) an absolute value of r of 0.1 is classified as small, an absolute value of 0.3 is classified as medium and of 0.5 is classified as large. Correlation coefficients range from -1 to +1. The closer the correlation coefficient is to one, the greater the correlation.

3.8.3 Multiple Regression Analysis

Multiple regression analysis is a statistical tool that allows the researcher to examine how multiple independent variables are related to a dependent variable. This research using multiple regression to analyze the relationship between for independent variables (Prevent from pollution, Reducing global warming, Large of fund needed to develop green technology and Lack of knowledge of green technology) towards dependent variables (The advantages and disadvantages of using green technology).

3.8.4 Pilot Test

Pilot test is a sort of software testing performed by a group of end users prior to the release of the software into production. Using this testing method, a component of the system or the entire system is tested in real-time. To undertake this type of testing, the system is installed at the customer's location. The client conducts continuous and frequent testing to identify problems. In a real-time setting, a component of the system or the entire system is tested and verified.

A pilot study has the advantage of providing early warning about areas where the big research project may fail, such as when research protocols are not followed or if planned methodology or equipment are incorrect or overly complicated. Through pilot testing, researchers were able to discover which questions respondents were unable to answer. This is

because pilot respondents will be asked to write several responses to the same questions while making notes in the margin. These flaws could indicate that the study approach was inappropriate, requiring the researcher to re-evaluate the procedure.

According to Tavakol. M, and Dennick. R (2011), a lower number of respondents will be used in the pilot testing. Supervisors will assist in ensuring that the questionnaire's content and structure are proper and appropriate. A good questionnaire should be dependable and valid. Cronbach's alpha is a value between 0 and 1 that is commonly used to quantify internal consistency. The alpha value should be higher than 0.70**.**

3.9 Summary

In this study, the research objectives were gathered by a questionnaire survey. The study's summary was developed utilising data analysis findings and comparisons between thoughts and research. The questionnaire survey will be completed in the following chapter, and the data collected will be examined.

CHAPTER 4

DATA ANALYSIS AND RESULT

4.0 Introduction

This chapter will cover numerous elements, including descriptive analysis, descriptive statistics, scale measurement, and inferential analysis, which includes Pearson Correlation, Multiple Regression, and Linear Regression. The data acquired from the questionnaire will be computed and analysed using the SPSS Version 25 programme. This chapter will interpret the data obtained.

4.1 Pilot Test

Pilot test is initial step that need to do before the distribution of questionnaire. A pilot study can reveal deficiencies in the design of a proposed experiment or procedure and these can then be addressed before time and resources are expended on large scale studies (Emmanuel, O. et al., 2011). The researcher distributes the questionnaire to 30 respondent to complete the pilot test.

Table 4.1: Reliability for Pilot test

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.913	.911	26

In the Pilot test, the Cronbach's Alpha is 0.913. The value is over than 0.7, this behalf the Pilot test is more reliable the generated scale and high reliability. Beside, this also represent the questionnaire is excellent and can use in the research.

4.2 Reliability Statistic

Cronbach alpha is used to assess the questionnaire's reliability. Lee Cronbach invented Alpha in 1951 to offer a measure of a test's or scale's internal consistency; it is represented as a number between 0 and 1. The use Cronbach Alpha is lead to situation in which either a test or scale is wrongly discarded or the test is criticised for not generating trustworthy result (Tavakol et al., 2011). Alpha is an essential notion in assessment and questionnaire evaluation. A low alpha value might be caused by a small number of questions, weak interconnectedness between items, or diverse conceptions.

Table 4.2: Reliability Statistic for Variables

Variables	Number of items (N)	Cronbach's Alpha
Pollution prevention	3	0.791
Reducing global warming	3	0.758
Financial support	3	0.795
Green technology awareness	3	0.790

4.3 Analysis Of Demographic Profile Of Respondent

Describe the respondent's background using questionnaires in this section. The goal of demographic analysis is to gain a better knowledge of respondent characteristics such as gender, age, and others. A total of 235 questionnaires were gathered. The researcher use descriptive statistics to demonstrate the outcome of data collection. Gender, age, race, level of study, and year of study are the five demographic questions that will be asked.

4.3.1 Gender

Table 4.3: Respondent's gender

q1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	142	60.4	60.4	60.4
	2	93	39.6	39.6	100.0
	Total	235	100.0	100.0	

Source: This table was developed based on the SPSS

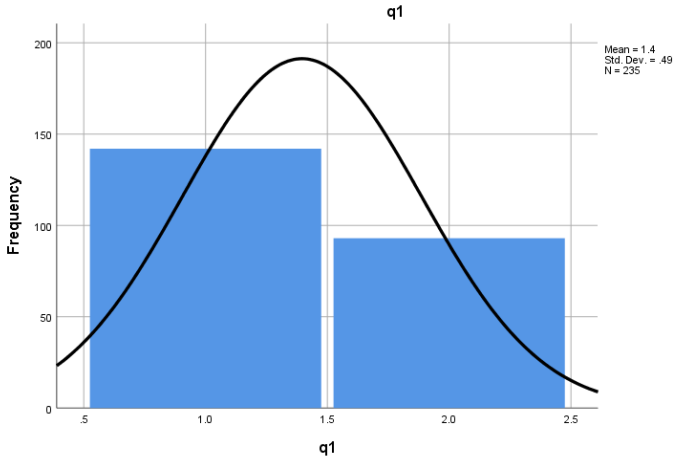


Figure 4.1: Respondent gender

The Table 4.3 and Figure 4.1 shows that the gender distribution of respondent in this research. Based on the table and figure, the result show the majority of respondent are male (1) which consist of 60.4% (142 respondents), while female (2) respondents involves of 39.6% (93 respondents). This result shows that the questionnaire have been distributed considerably among male and female.

4.3.2 Age

Table 4.4: Respondent age

q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	234	99.6	99.6	99.6
	2	1	.4	.4	100.0
	Total	235	100.0	100.0	

Source: This table was developed based on the SPSS

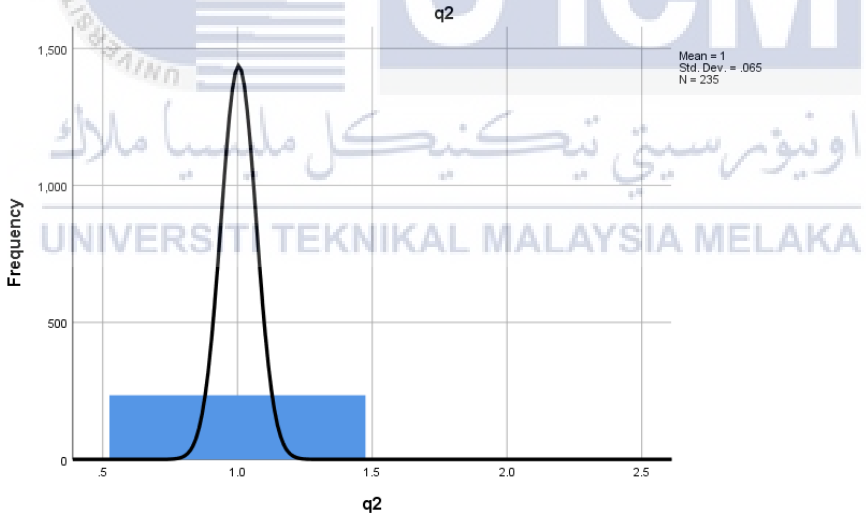


Figure 4.2: Respondent age

According to Table 4.4 and Figure 4.2 above, the higher percentage of respondents on this study is aged 20 to 25 years old (1) which is 99.6% (234 respondents). The lowest percentage age of respondent is 26 to 30 years old (2) that consist 0.4% (1 respondent).

4.3.3 Race

Table 4.5: Respondent race

q3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	224	95.3	95.3	95.3
	2	4	1.7	1.7	97.0
	3	7	3.0	3.0	100.0
	Total	235	100.0	100.0	

Source: This table was developed based on the SPSS

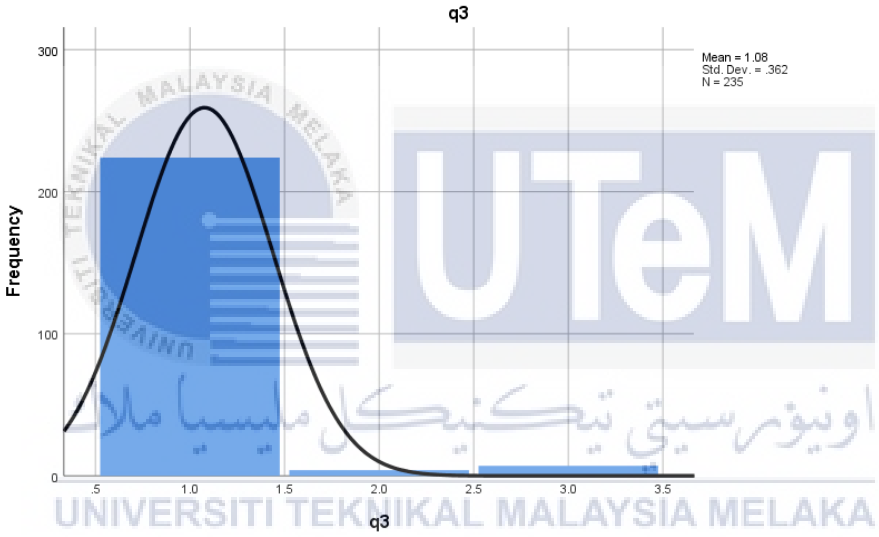


Figure 4.3: Respondent race

The Table 4.5 and Figure 4.3 shows the respondent race. The higher number of respondent based on race which is Malay (1) 95.3% (224 respondents) followed by India (3) 3.0% (7 respondents), and the lowest respondent come from Chinese (2) which is 1.7% (4 respondents).

4.3.4 Level of study

Table 4.6: Respondents level of study

LEVEL OF STUDY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	4.3	4.3	4.3
	2	224	95.3	95.3	99.6
	3	1	.4	.4	100.0
	Total	235	100.0	100.0	

Source: This table was developed based on the SPSS

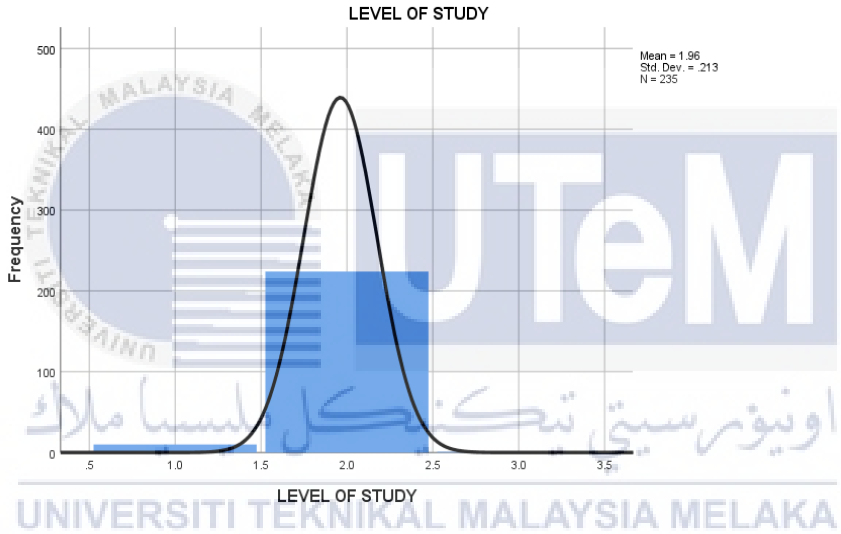


Figure 4.4: Respondent level of study

The Table 4.6 and Figure 4.4 shows the respondents level of study. The higher percentage is Bachelor Degree (2) which is 95.3% (224 respondents). The second higher percentage is Diploma (1) consist of 4.3% (10 respondents). The lowest percentage is come from Master Degree (3) which is 0.4% (1 respondent).

4.3.5 Year of study

Table 4.7: Respondents year of study

YEAR OF STUDY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	.9	.9	.9
	2	28	11.9	11.9	12.8
	3	23	9.8	9.8	22.6
	4	182	77.4	77.4	100.0
	Total	235	100.0	100.0	

Source: This table was developed based on the SPSS

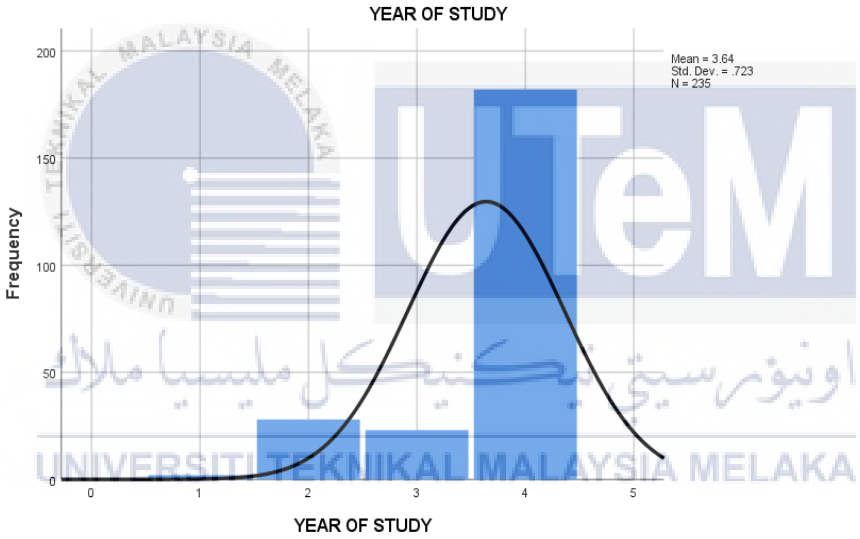


Figure 4.5: Respondents year of study

According to Table 4.7 and Figure 4.5 above, the higher percentage of respondent on this study is year 4 which is 77.4% (182 respondents). The second higher percentage is year 2 that consist 11.9% (28 respondents) followed by year 3 which is 9.8% (23 respondents). The lowest percentage is year 1 which is 0.9% (2 respondents).

4.4 Descriptive Analysis Of The Relationship Variable

4.4.1 Descriptive Variable for all analysis

Table 4.8: Descriptive analysis for all variable

Descriptive Analysis

Item Statistics

	Mean	Std. Deviation	N
p	4.2723	.39049	235
re	4.3078	.39622	235
f	4.2979	.40318	235
k	4.2809	.40367	235
dv	4.0894	.33906	235

Table 4.8 show the descriptive analysis for all variables. It starts from independent variables which is prevent from pollution, reducing global warming, lack of finance support, lack of knowledge about green technology, while dependent variable is UTEM green university. This descriptive analysis is included mean and standard deviation from the variables of the 235 respondents. Mean value for all variables is the first one is prevent from pollution is 4.2723, reducing global warming is 4.3078, lack of finance support is 4.2979, lack of knowledge about green technology is 4.2809 and UTEM green university is 4.0894. Finally, we can observe that the majority of the respondents agree with the assertion. The standard deviation is then described using descriptive analysis. It scores 0.39049 for prevent from pollution, 0.39622 for reducing global warming, 0.40318 for lack of finance support, 0.40367 for lack of knowledge about green technology, and 0.33906 for UTEM green university. All of these values are less than 1.25, indicating that all variables are acceptable.

4.4.2 Descriptive analysis for each variable

4.4.2.1 Pollution prevention

Table 4.9: Descriptive analysis for pollution prevention

Descriptive Analysis

Item Statistics

	Mean	Std. Deviation	N
a. The use of green technology can reduce odor pollution found around the UTEM area."	4.27	.456	235
b. Green technology is able to reduce the level of air pollution in the UTEM area"	4.27	.474	235
c. More efficient disposal of solid waste can be done through the use of green technology	4.27	.465	235

From Table 4.9, the findings reveal that the maximum mean ease of use value was (M=4.27) with the all items. The highest standard deviation value is 0.474 shows the item on "Green technology is able to reduce the level of air pollution in the UTEM area". Meanwhile, the lowest standard deviation value shows the item on "The use of green technology can reduce odor pollution found around the UTEM area", which the value 0.456.

4.4.2.2 Reducing global warming

Table 4.10: Descriptive analysis for reducing global warming

Descriptive analysis

Item Statistics

	Mean	Std. Deviation	N
a. Green technology is able to reduce the high heat rate in the UTEM area	4.26	.470	235
b. The use of green technology can reduce the excessive use of electricity	4.34	.491	235
c. The rate of carbon dioxide emissions into the atmosphere can be reduced	4.32	.487	235

From Table 4.10, the findings reveal that the highest mean ease of use value was (M=4.34) with the items on "The use of green technology can reduce the excessive use of electricity". The standard deviation value is 0.491. Meanwhile, the lowest mean value shows the item on "Green technology is able to reduce the high heat rate in the UTEM area", which the value (M=4.26) and the standard deviation was 0.470.

4.4.2.3 Financial support

Table 4.11: Descriptive analysis for financial support

Descriptive Analysis

Item Statistics

	Mean	Std. Deviation	N
a. The tools used to create green technology are quite expensive	4.28	.469	232
b. Wages or the creation of green technology cost a lot	4.28	.476	232
c. The funds allocated by the university or the government are still insufficient	4.35	.496	232

From Table 4.11, the findings reveal that the highest mean ease of use value was (M=4.35) with the items on "The funds allocated by the university or the government are still insufficient". The standard deviation value is 0.496. Meanwhile, the lowest mean value shows the item on "The tools used to create green technology are quite expensive" and "Wages or the creation of green technology cost a lot", which the value (M=4.28) and the standard deviation was 0.469 and 0.476.

4.4.2.4 Green technology awareness

Table 4.12: Descriptive analysis for green technology awareness

Descriptive Analysis

Item Statistics

	Mean	Std. Deviation	N
a. The lack of involvement of educational institutions in applying the knowledge of the use of green technology	4.22	.453	235
b. Lack of public relations role in promoting green technology	4.34	.519	235
c. Minimal use of social media in providing knowledge on green technology	4.28	.469	235

From Table 4.12, the findings reveal that the highest mean ease of use value was (M=4.34) with the items on "Lack of public relations role in promoting green technology". The standard deviation value is 0.519. Meanwhile, the lowest mean value shows the item on "The lack of involvement of educational institutions in applying the knowledge of the use of green technology, which the value (M=4.22) and the standard deviation was 0.453.

4.5 Inferential Analysis

4.5.1 Pearson's Correlation Analysis

The Pearson Correlation Coefficient is a measure of how well two variables are related. The correlation coefficient's strength is indicated in the table below.

Table 4.13: Strength of the Correlation Coefficient (Hair et al., 2010)

Coefficient Range	Description of Strength
±0.81 to ±1.00	Very Strong
±0.61 to ±0.80	Strong
±0.41 to ±0.60	Moderate
±0.21 to ±0.40	Weak
±0.00 to ±0.20	Very Weak

The independent and dependent variable use in this study are as follow:

4.5.2.1 Independent Variables: Pollution prevention, Reducing global warming, Financial support and Green technology awareness

4.5.2.2 Dependent Variable: UTEM green technology adoption

Table 4.14: Result of Correlations Analysis for All Variable (Source: SPSS Output)

Correlations

		Pollution prevention	Reducing global warming	Financial support	Green technology awareness	UTEM Green technology adoption
Pollution prevention	Pearson Correlation	1	.812**	.776**	.703**	.196**
	Sig. (2-tailed)		.000	.000	.000	.003
	N	235	235	235	235	235
Reducing global warming	Pearson Correlation	.812**	1	.731**	.731**	.371**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	235	235	235	235	235
Financial support	Pearson Correlation	.776**	.731**	1	.732**	.242**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	235	235	235	235	235
Green technology awareness	Pearson Correlation	.703**	.731**	.732**	1	.243**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	235	235	235	235	235
UTEM Green technology adoption	Pearson Correlation	.196**	.371**	.242**	.243**	1
	Sig. (2-tailed)	.003	.000	.000	.000	
	N	235	235	235	235	235

**. Correlation is significant at the 0.01 level (2-tailed).

The Pearson Correlation Coefficient Analysis of independent variables and dependent variables is shown in Table 4.14. Every independent variable, such as pollution prevention, reducing global warming, financial support and green technology awareness, has a significant two-tailed connection with UTEM green technology adoption at 0.01 levels. First, pollution prevention is having correlation with UTEM green technology adoption with value 0.196. So, it shown the result is very weak and negative. Second is reducing global warming. Reducing global warming has a correlation with UTEM green technology adoption with value 0.371 which is it have weak and negative. Third is financial support. Financial support has a correlation with UTEM green technology adoption with value 0.242 which is it a negative and weak. Last but not least is green technology awareness. Green technology awareness have a correlation with UTEM green technology adoption with value 0.243 which is have a negative and weak. All of this independent variables and dependent variable are needed to achieves the objectives. According to the correlations research, the most significant association between independent factors and UTEM green technology adoption is reducing global warming (0.371), followed by green technology awareness (0.243). Pollution prevention and financial support have the lowest link between independent factors and UTEM green technology adoption, at 0.196 and 0.242.

4.5.2 Multiple Regression Analysis

Table 4.15 Model Summary

Source: SPSS Data Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.415[a]	.172	.158	.31118

a. Predictors: (Constant), k, p, f, re

4.5.2.1 Predictors: (Constant), Pollution prevention, Reducing global warming, Financial support, Green technology awareness

Table 4.15 shows that the R is 0.415, indicating that the independent variables (prevent from pollution, reducing global warming, lack of finance support and lack of knowledge about green technology) were associated and relevant to the association with UTEM green university in order to meet the study's goals. Furthermore, the R square value is 0.172, implying that the overall variation in achieving the objectives with UTEM green university is 17.2 percent. Only 82.8 percent of the population was not affected.

Table 4.16 Coefficients

(Source SPSS Output)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.911	.244		11.921	.000
	Pollution prevention	-.303	.101	-.349	-2.999	.003
	Reducing global warming	.518	.096	.605	5.374	.000
	Financial support	.067	.089	.080	.757	.450
	Green technology awareness	-.011	.082	-.013	-.134	.894

a. Dependent Variable: dv

a) Dependent variable: UTEM green technology adoption

Based on Table 4.16, the beta for pollution prevention, reducing global warming, financial support and green technology awareness are -0.303, 0.518, 0.067 and -0.011 respectively. Based on beta, two variables have a positive relationship as, the researcher notice that there is two independent variable with negative sign, which has negative relationship with UTEM green technology adoption. The constant is 2.911. Therefore, the researcher formed the following equation:

$$\mathbf{Y = A + Bx1 + Bx2 + Bx3 + Bx4}$$

Where:

Y= Dependent Variable

A= Constant from coefficients table

B = Independent Variable

x = Beta, B value

Bx1 = Pollution prevention

Bx2 = Reducing global warming

Bx3 = Financial support

Bx4 = Green technology awareness

UTEM Green technology adoption = 2.911 + 0.518 (Reducing global warming) + 0.067 (Financial support)

When the pollution prevention increases one unit and the other variables remain constant, the linear equation shows that the UTEM green technology adoption will grow -0.329 units. Following that, when reducing global warming increases by one unit and the others stay same, UTEM green technology adoption will grow by 0.518 units. Furthermore, when financial support improves by one unit but the other predictor remains the same, UTEM green technology adoption increases by 0.067 units. Lastly, UTEM green technology adoption will increase -0.011 units when green technology awareness increase one unit with condition the rest of the independent variable unchanged.

Table 4.17 ANOVA

(Sources: SPSS Output)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.630	4	1.157	11.953	.000[b]
	Residual	22.271	230	.097		
	Total	26.901	234			

a. Dependent Variable: dv

b. Predictors: (Constant), green technology awareness, pollution prevention, financial support, reducing global warming

a) Dependent Variable: UTEM green technology adoption
b) Predictors: (Constant), Pollution prevention, Reducing global warming, Financial support, Green technology awareness

F = 11.953 with p = 0.000 according to the ANOVA table. As a result, the model's fit has been confirmed. The entire regression model, which includes four constants: pollution prevention, reducing global warming, financial support, green technology awareness, has done a good job of explaining adoption variation.

4.6 Hypothesis Analysis

In this regression analysis, independent variables included pollution prevention, reducing global warming, financial support, green technology awareness, whereas dependent variables included UTEM green technology adoption. Because the significance value is less than 0.05, the hypothesis can be maintained. Finally, if the significance value for the independent variable is greater than 0.05, the independent variable has no effect on the dependent variable.

Pollution prevention

H1: Pollution prevention has significant influence on UTEM green technology adoption

Reducing global warming

H2: Reducing global warming has significant influence on UTEM green technology adoption

Financial support

H3: Financial support has significant influence on UTEM green technology adoption

Green technology awareness

H4: Green technology awareness has significant influence on UTEM green technology adoption

INDEPENDENT VARIABLES	SIGNIFICANT VALUE	RESULT
Pollution prevention	0.003	Accepted
Reducing global warming	0.000	Accepted
Financial support	0.450	Rejected
Green technology awareness	0.894	Rejected

Table 4.18 Hypothesis Testing Analysis

4.7 CONCLUSION

The researcher utilised SPSS software version 25 to accomplish all of the data analysis and interpretation in this chapter. There are 235 respondents in the data that has to be analysed. The association between pollution prevention, reducing global warming, financial support, green technology awareness, and UTEM green technology adoption was found to be adequate. As a result, the four hypotheses provided in this study were explained. In the next chapter, we'll go over more facts and have a conversation.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.0 Conclusion

The findings of the data acquired in Chapter 4 will be addressed briefly in this chapter. The results of this investigation were utilised to determine if the proposed hypothesis was correct. It was also evaluated to verify if the research questions aligned with the research aim of the study. This chapter summarises the descriptive analysis, analyses the findings, and explores the important implications of the research in terms of theoretical contribution, management level, and policymaker. This section will evaluate the findings and explanations behind the findings based on previous research in three sections to cover the following research goals:

RO1: To study the level of knowledge of UTEM citizens about green technology.

RO2: To investigate the advantages and disadvantages of using green technology

RO3: To examine what activities can be done to make a safe environment using green technology in UTEM

5.1 Summary Of Objectives

5.1.1 To study the level of knowledge of UTEM citizens about green technology

The first objectives was to understand about the level of knowledge of UTEM citizens about green technology. Researchers studied and discovered a lot of related issues research papers using primary and secondary data in order to identify the relationships. To begin with, I have a broad knowledge about green technology. Most respondent have shown that they have known basic knowledge about green technology especially the green technology goals which is green technology is to help control climate change, protect the natural environment, reduce our dependence on Non-Renewable resources such as fossil fuel, and heal the damage done to the environment (Wahid Ali, 2021). The respondent also shown that they know about the definition of green technology term similar to several scholar state which is green tech is an umbrella term that encapsulates any technology that is created to be environmentally friendly from its production line all the way to its usage (Mariya Noor, 2021).

Secondly, I gained knowledge about green technology from educational institution or non-governmental organizations. Mostly respondent have know the knowledge of green technology from their school, university or active NGO. Green technology is the most anticipated technology to combat the issues, which has been rampant on our precious planet. Green technology is ecologically friendly technology that has no negative environmental impact. Green technology should be upgraded on a constant basis, and people should be socialised to it in order for it to be accepted and accounted for. Higher education makes a significant contribution to the improvement of the quality of human resources in a country. Thus, universities have an important responsibility for providing knowledge of green technology for their students (H. Febriani, 2018).

Last but not least, I know about green technology from campaigns or programs that have been held. It is important to held frequently campaign or program about green technology because it can gave some information to people about green technology in generally. The main thrust in the Green Technology sector is to provide an education and public awareness

on green technology as well as to promote the widespread of using green technology (K. Hassan, 2017). The objective is researcher want to know either campaign or programme can give information and help people to know about green technology. The government and non-governmental organisations (NGOs) have emphasised the need of employing green technology in communities in a variety of ways, such as the Go Green and Earth Hour campaigns. From this objective, it shown that campaign and programme have help UTEM citizens to know about green technology.

5.1.2 To investigate the advantages and disadvantages of using green technology

These objectives was to look into the advantages and disadvantages of using green technology. The coefficient of multiple regression analysis was used to achieved this objectives.

By using the coefficient of multiple regression analysis from Table 4.22, the first highest beta value which is in 0.518. This is because reducing global warming was the main factors why we need green technology. Second is financial support. It is second highest beta value for lack of financial support in 0.067. Third is green technology awareness with it is -0.011. This show that green technology awareness give second least for UTEM green technology adoption. And the last one is pollution prevention with its beta value -0.303. In conclusion, there have two factors that have positive relationship between UTEM green technology adoption and the advantages and disadvantages of using green technology.

Next, as we can see by coefficient of multiple regression analysis there have positive significant and for summary from table 4.23 Anova F value is in 26.901 that's mean the predictors (constant, pollution prevention, reducing global warming, financial support and green technology awareness) have a positive relationship with dependent variable which is the UTEM green technology adoption.

The next objective was to investigate the advantages and disadvantages of using green technology. This research objective can be reached through the result from analysis of Person's Correlation Coefficient in Chapter 4 (Table 4.14). Surprisingly, the results of the present study tested was shows the highest until the lowest significant relationships between independent variables and dependent variable.

Firstly, the highest correlation relationship is between reducing global warming and UTEM green technology adoption was weak correlation (r=0.371**). This study is to control climate change, protect the natural environment, reduce our dependence on Non-Renewable resources such as fossil fuel, and heal the damage done to the environment. (M. Z. Qamar, 2020). Today, non-renewable energy accounts for the vast majority of global energy production. Green technology may be utilised to construct alternative, more ecologically friendly structures, particularly in the UTEM environment. For example, fossil fuels typically generate trash. Solar, wind, and hydroelectric dams can be utilised instead of fossil fuels because they are ecologically friendly and do not affect the UTEM environment.

Secondly, the highest correlation relationship is between green technology awareness and UTEM green technology adoption was weak correlation (r=0.243**). Creating awareness of green technology and its practices to employees can increase knowledge and reduce the negative impact on the environment (HR Musa, 2017). Organizations should raise awareness of green practises to ensure that individuals have a basic grasp of them. Green practise knowledge has been a critical aspect in implementing green practises.

Next, the second least correlation relationship is between financial support and UTEM green technology adoption was weak correlation (r=0.242**). Mahat (2019) mentioned that using modern technologies such as the application of green building material is considered costly due to the need for technical capacity, lack of competition, and is mostly manufactured abroad. When compared to traditional materials and procedures, the capital cost for the material and installation itself is prohibitively expensive. As a result, many developers are hesitant to include green technology components in their projects. Using this new technology may raise the cost of development.

Lastly, the lowest correlation relationship is between pollution prevention and UTEM green technology adoption. It was a very weak correlation (r=0.196**). Green technology or environmental technology is the activities that have minimal effects on the environment. These activities include: reducing wastage, energy generations, deploying nontoxic/harmful substances, efficiency improvements, and so on (Mohammed S.I , 2021). Most of the pollution is caused by human hands. Maybe green technology is able to reduce the effects of pollution, but green technology is not able to immediately eliminate pollution if humans are still doing activities towards pollution.

5.1.3 To examine what activities can be done to make a safe environment using green technology in UTEM

Firstly, what activities can be done to make a safe environment using green technology in UTEM is emphasis on recycling and waste management to factories around UTEM. Most respondent show their interest in this activity is because industrial waste has become a critical issue, raising worries about global sustainability and environmental impacts (Macarthur, 2012). The scope of waste management is broad and includes several words. Both industrial waste and the depletion of virgin materials put pressure on manufacturing enterprises to discover new environmentally friendly techniques. Various ways have been developed in academia and business in recent years, but proof of their practical application is lacking. They also overlap in that they have similar aims and propose comparable waste management practises. Zero waste, waste minimisation, zero emission, and waste prevention are examples of such notions.

Secondly, increasing recycle bins in every faculty. Recycling is the method of reusing and recycling things rather than discarding them as waste for new production (Nordila, 2021). Recycling keeps the environment clean and sustainable for future generations. Furthermore, it assists UTEM by conserving energy and natural resources. Sorting waste is one step toward recycling. Waste sorting comes before recycling. This is the stage at which general garbage from diverse materials such as glass, paper, wood,

metals, and plastic is eliminated. Placing recycling bins near the UTEM, in particular, considerably recovered the recycling item, reducing trash disposal.

Thirdly, reduce the use of plastic bag and every cafe or canteen to reduce the pile of plastic waste. Plastic bag mishandling has exacerbated worldwide plastic waste (W.L.Ming, 2021).The plastic bag takes time to decompose in the soil and contributes to contamination of the water and soil. Even while the plastic bag is useful to UTEM inhabitants, careless disposal of the plastic bag has become a problem that is unfavourable and harmful to the environment. The occurrence of activities including recycling and collecting plastic garbage demonstrates that such issues exist on campus in order to decrease on-campus plastic pollution. To address the environmental issue of plastic trash, plastic bag use must be reduced or eliminated entirely.

Next, what activities can be done to make a safe environment using green technology in UTEM is harnessing solar energy to reduce global warming. The energy source that fuels the Earth's temperature and biosphere is sunlight (Ekins, 2009). Using this energy to generate hot water and electricity might give a sustainable, low-carbon energy source and an appealing method of combating climate change. Solar technology are already being used to improve the level of living in developing nations. They are an obvious solution if there is a strong solar input but grid services are absent or limited. Because of its intermittent nature, solar energy may appear less appealing than traditional sources, but with the correct equipment, it may provide significant advantages in terms of decreased carbon emissions and greater energy security.

Furthermore, hold more frequent campaign or carnival about green technology in UTEM. Green campus campaigns should be supported by all campus community in universities (Jestin, 2021). The primary focus of the Green Technology sector is to educate and raise public knowledge of green technology, as well as to encourage the broad use of green technology. Public awareness should not be limited to the elderly; students, particularly those at UTEM, should be aware of green technology. The government and non-governmental organisations (NGOs) should emphasise the necessity of employing green technology to UTEM residents in a variety of methods, such as the Go Green and Earth Hour initiatives.

Last but not least, collaborate with non-governmental organization (NGO) or renowned companies on the development of green technology. These collaborations

have tried to effect change in company operations and strategy, as well as to ameliorate a variety of broadly defined environmental and social concerns (Shah, 2020). Green technology offers a method for reconciling the demands for economic development and environmental responsibility. As there is a rising worldwide need to address climate change, sustainable development and green technology must work together to drive the economy, create employment, and attract investments. These programmes aim to stimulate investments in green equipment manufacture and the use of green technology by service/system providers, as well as to encourage businesses to buy green-certified assets.

5.2 Limitations

There are a few constraints that the researcher must deal with during the investigation. Researchers must choose between time management and time constraints. The researcher must discover a better platform to distribute the survey, and the survey must be completed within two months. This study requires around 235 respondents. Next, the responders come from a variety of backgrounds, and some of them do not speak English. They may not grasp the researcher's language or sentence structures. As a result, the information gathered may be inaccurate and the researcher may fall short of his or her goals.

Another disadvantage of this study is that the researcher believes the responder is aware of the investigation. The respondent may also merely fill out the form, and some may answer the question without completely comprehending it. This also occurs when respondents are compelled to reply to a questionnaire or do not respond in a timely manner. This will have an indirect effect on the incorrect data to input into SPSS. This will result in the survey being circulated again in order to obtain adequate and proper data to process in SPSS.

5.3 Recommendations

Based on the results and conclusions in the preceding chapter, the researcher has various recommendations to consider throughout the investigation. First, the researcher notices that more relevant aspects should be included in this topic since there are a variety of variables which in green technology adoption to improve UTEM environment. The researcher recommends that the future researcher explore other factors, such as ethical consciousness, as these elements can add value to this research.

Aside from quantitative research, future study should include qualitative methods such as face-to-face interviews with members of the focus group or experts in the business. This can also result in more meaningful and credible conclusions from the organization's respondents. Furthermore, it may demonstrate the importance of using green technology to improve the environment in UTEM.

Furthermore, future researchers should be more enthusiastic to acquire further information about this study through publications, journals, and books, as well as conduct in-depth interviews with possible participants. As a result, future researchers will have a better knowledge of this study and will be able to help with the most recent research updates on people's trends and opinions.

5.4 Contribution

The fundamental purpose of this research is to get insight into and knowledge of the importance of green technology adoption in improving the UTEM environment. This study's conclusions and findings are relevant and beneficial to a wide range of parties, including academic learners, responders, government agencies, and non-governmental groups (NGOs). As academic students, this study can offer them with quantifiable statistical results based on a combination of theoretical knowledge and actual onsite data collecting in a real-world setting. Academic learners are able to study the value of green technology adoption, grasp green technology adoption, and lead them to improve the UTEM environment.

Respondents who engage in the question study can gain fresh knowledge and learn more about the researcher's issue. Because this study subject on green technology adoption is uncommon, it helps to raise respondent knowledge of the necessity of green technology adoption, develops their desire to learn more about green technology, and increases their intention to utilise green technology.

5.5 Implication Of Research

The discovery of this research can prove valuable and provide information about the importance of green technology adoption to improve environment in UTEM. Beside, this research found that the variable of reducing global warming and lack of knowledge about green technology are most influential variables.

The finding in this study revealed that Reducing global warming is the most influential variable which has the highest t-value and p-value (t=5.374, p=0.371). Thus, this variable helps in understanding the importance of green technology adoption to improve environment in UTEM.

5.6 Conclusion

This study was carried out to gain a better knowledge of the significance of green technology adoption in improving the environment at UTEM. The research objectives outlined in the early stages were met with success in this study. In this chapter, the researcher has discussed the limits experienced while doing the research during the data collection time. These limits compelled the researcher to provide a few suggestions for further investigation. The researcher also listed the objectives one by one, according to previous study. Finally, all of the independent factors, such as pollution prevention, reducing global warming, financial support, and green technology awareness, are crucial in assuring the importance of green technology adoption to improve the environment at UTEM.

REFERENCES

1. Kamal, M. (2015). *60_IJRG15_S09_99 (1).PDF - [Social Issues and Environmental Problems, Vol.3 (ISS.9:SE): Sep, 2015] ISSN- 2350-0530(o) ISSN- 2394-3629(p) impact factor:: Course hero*. 60_IJRG15_S09_99 (1).pdf - [Social Issues and Environmental Problems, Vol.3 (Iss.9:SE): Sep, 2015] ISSN- 2350-0530(O) ISSN-2394-3629(P) Impact Factor: | Course Hero. Retrieved June 20, 2022, from https://www.coursehero.com/file/65234946/60-IJRG15-S09-99-1pdf/
2. Kadiyono1, A. L., Harding1, D., Hafiar2, H., Nugraha1, Y., Ma'mun3, T. N., Siswadi1, A. G. P., & Wibowo4, H. (2019, March 1). *IOPscience*. Journal of Physics: Conference Series. Retrieved June 20, 2022, from https://iopscience.iop.org/article/10.1088/1742-6596/1175/1/012170/meta
3. Guo, M. (2020). *Sustainability-12-06571-v2.pdf - sustainability article Green Technology and Sustainable Development: Assessment and green growth frameworks minjian guo: Course hero*. sustainability-12-06571-v2.pdf - sustainability Article Green Technology and Sustainable Development: Assessment and Green Growth Frameworks Minjian Guo | Course Hero. Retrieved June 20, 2022, from https://www.coursehero.com/file/149071356/sustainability-12-06571-v2pdf/
4. Hisyam, A. (2019). *Introduction meaning branches of Green Technology*. Green Technology. Retrieved June 20, 2022, from http://jsscon.org/wp-content/uploads/2019/03/green-technology-pdf.pdf
5. Ali, W. (2021). *Green technology and its implications worldwide - researchgate*. Green Technology and Implication. Retrieved June 20, 2022, from https://www.researchgate.net/publication/350443477_Green_Technology_and_its_Implications_Worldwide
6. Pacheco, M. (2019). *Introductory chapter: Green Technologies to improve the environment on ...* Green Technology. Retrieved June 20, 2022, from https://www.researchgate.net/publication/330943303_Introductory_Chapter_Green_Technologies_to_Improve_the_Environment_on_Earth
7. Joda, S. (2019). *The experience of Green Technology in Malaysia and its role in ...* Experience Green Technology. Retrieved June 20, 2022, from https://www.researchgate.net/publication/355913740_The_Experience_of_Green_Technology_in_Malaysia_and_its_Role_in_Enhancing_Sustainable_Development

8. Bhardwaj, M. (2021). *The advantages and disadvantages of green technology - researchgate*. The advantages and disadvantages of green technology. Retrieved June 20, 2022, from https://www.researchgate.net/profile/Monu-Bhardwaj/publication/357269773_The_Advantages_and_Disadvantages_of_Green_Technology/links/61c43849c48a3d26b74a8a13/The-Advantages-and-Disadvantages-of-Green-Technology.pdf?origin=publication_detail
9. Technology, U. S. G. (1970, January 1). U.S. Green Technology. Retrieved June 20, 2022, from https://usgreentechnology.blogspot.com/
10. Prasad, S. (n.d.). *Official website dr. Shyama Prasad Mukherjee university ranchi,Jharkhad,best college in Ranchi*. dspmuranchi.ac.in. Retrieved June 20, 2022, from http://www.dspmuranchi.ac.in/
11. Geographic, N. (n.d.). Education.nationalgeographic.org. Retrieved June 20, 2022, from https://education.nationalgeographic.org/?q=&page%5Bnumber%5D=1&page%5Bsize%5D=25
12. Söderholm, P. (2020, June 22). *The Green Economy Transition: The Challenges of technological change for sustainability - sustainable earth*. BioMed Central. Retrieved June 20, 2022, from https://sustainableearth.biomedcentral.com/articles/10.1186/s42055-020-00029-y#:~:text=The%20article%20centers%20on%20the,uncertain%20business%2Das%2Dusual%20scenario
13. Ahmad, Z. (2017). *Advantages and disadvantages of green technology; goals ... - IJSEA*. Advantages and Disadvantages green. Retrieved June 20, 2022, from https://ijsea.com/archive/volume6/issue9/IJSEA06091005.pdf
14. Mitra, A. (2018). *(PDF) environmental pollution and its control - researchgate*. Environmental pollution. Retrieved June 20, 2022, from https://www.researchgate.net/publication/327779390_Environmental_Pollution_and_Its_Control
15. Shahzad, U. (2015). *Global warming: Causes, effects and solutions*. Global Warming. Retrieved June 20, 2022, from https://lms.su.edu.pk/download?filename=1620465731-global-warming.pdf&lesson=56520
16. Ahuja Ram, (2010), Research Methodology, New Delhi: Rawat Publication

17. Indeed, C. (2021). *What is research methodology? (why it's important and types)*. Indeed Career Guide. Retrieved June 20, 2022, from https://www.indeed.com/career-advice/career-development/research-methodology
18. Bhandari, P. (2021, December 8). *An introduction to quantitative research*. Scribbr. Retrieved June 20, 2022, from https://www.scribbr.com/methodology/quantitative-research/#:~:text=Quantitative%20research%20is%20the%20process,generalize%20results%20to%20wider%20populations.
19. Wedawatta. (2011). *Case study as a research strategy: Investigating extreme weather ...* University Salford. Retrieved June 20, 2022, from https://usir.salford.ac.uk/id/eprint/18250/1/6_Wedawatta_Case_study_as_a_research_strategy_Investigating_extreme_weather_resilience_of_construction_SMEs_in_the_UK.pdf
20. *Kerjasama UiTM, Sunway University Bangunkan Teknologi ... - berita harian*. Berita Harian. (2019). Retrieved June 20, 2022, from https://www.bharian.com.my/berita/pendidikan/2019/09/608231/kerjasama-uitm-sunway-university-bangunkan-teknologi-hijau
21. UPM. (2022). *Teknologi Nano Menyejukkan Suhu Bangunan | Putra science park - UPM*. Universiti Putra Malaysia. Retrieved June 20, 2022, from https://sciencepark.upm.edu.my/berita/teknologi_nano_menyejukkan_suhu_bangunan-20122
22. Abd-Razak, M. Z., Mustafa, N. K. F., Che-Ani, A. I., Abdullah, N. A. G. and Mohd-Nor, M. F. I. (2011b), "Campus sustainability: Student"s perception on campus physical development planning in Malaysia", Procedia Engineering, Vol. 20 No. 1, pp.230-237.
23. Aljerf, L. and Choukaife, A. E. (2016), "Sustainable Development in Damascus University: A Survey of Internal Stakeholder Views", J Environ Stud, Vol. 2 No. 2, pp.1-12.
24. Alshuwaikhat, H. M. and Abubakar, I. (2008), "An integrated approach to achieving campus sustainability: assessment of the current campus environmental management practices", Journal of Cleaner Production, Vol. 16 No.16, pp.1777-1785.
25. Bollinger, B. K. (2011). *Green technology adoption in response to a dissertation - stacks*. Stanford University. Retrieved June 29, 2022, from https://stacks.stanford.edu/file/druid:kw873vh9740/Green%20Technology%20Adoption-augmented.pdf

26. Geng, Y. (2013). *Creating a "Green University" in China: A case of ... - researchgate*. Green University. Retrieved June 29, 2022, from https://www.researchgate.net/publication/259137996_Creating_a_green_university_in_China_A_case_of_Shenyang_University
27. Ali, W. (2021). *Green technology and its implications worldwide - researchgate*. Green technology and its implications worldwide. Retrieved January 8, 2023, from https://www.researchgate.net/publication/350443477_Green_Technology_and_its_Implications_Worldwide
28. Hassan, K. (2017). Awareness level of rural communities on the Green Technology and its ... Retrieved January 8, 2023, from https://www.researchgate.net/publication/323708052_AWARENESS_LEVEL_OF_RURAL_COMMUNITIES_ON_THE_GREEN_TECHNOLOGY_AND_ITS_RELATIONSHIP
29. Shahbazi, S. (2013). *Industrial Waste Management Within Manufacturing: A Comparative Study* ... Industrial waste management. Retrieved January 21, 2023, from https://www.researchgate.net/publication/267209102_Industrial_waste_management_within_manufacturing_A_comparative_study_of_Tools_policies_visions_and_concepts
30. Ahmad, N. (2021). *Recycling Waste Practice in campus towards a green campus and promotion* ... Recycling waste practice. Retrieved January 21, 2023, from https://www.ukm.my/jkukm/wp-content/uploads/2021/si4-1/02.pdf
31. Daukes, E. (2009). *Solar energy for heat and electricity: The potential for mitigating* ... Harnessing solar energy. Retrieved January 21, 2023, from https://www.solarthermalworld.org/sites/default/files/granthamjune.pdf

APPENDIX

THE IMPORTANCE OF GREEN TECHNOLOGY ADOPTION TO IMPROVE ENVIRONMENT IN UTEM (UNIVERSITI TEKNIKAL MALAYSIA MELAKA)

Assalamualaikum and Hello! I am Muhammad Asyraf Bin Shamsudin, a final year student from Universiti Teknikal Malaysia Melaka (UTeM) studying Bachelor of Technology Management with Honours (Innovation).

I'm conducting a research study entitled "The Importance of Green Technology Adoption to Improve Environment in UTEM". Green technology can be defined as one application, equipment or system that has characteristics that prioritize the preservation of the surrounding environment and are environmentally friendly (Rahman H A, 2017). The existence of green technology is built on human consciousness to preserve ecological sustainability, which influences human life sustainability.

This questionnaire contains three sections, and it may take approximately 5-10 minutes of your time to complete. Please read question carefully before answering them. All your personal information is kept strictly secret, and all responses will be used solely for research purposes. Your assistance in completing this survey is much appreciated.

For further Clarification and/or instruction, please contact:

Muhammad Asyraf Bin Shamsudin

Email: caapdin123@gmail.com

Tel: 019-5938428

Supervisor: Dr. Hazmilah Binti Hasan

SECTION 1: DEMOGRAPHIC

GENDER

- Male
- Female

AGE

- 20-25
- 26-30
- 31-35
- 36-40

RACE

- Malay
- Chinese
- Indian
- Other

YEAR OF STUDY

- 1
- 2
- 3
- 4

GREEN TECHNOLOGY KNOWLEDGE

Scale	1	2	3	4	5
Statement	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree

I have a broad level of green technology knowledge					
I gained knowledge about green technology from educational institutions or non-governmental organizations					
I know about green technology from campaigns or programs that have been held					

SECTION 2: THE ADVANTAGES AND DISADVANTAGES OF IMPLEMENTATION OR EMERGING GREEN TECHNOLOGY

This section has two parts which are part A and part B. Part A has about the advantages of implementation or emerging green technology. Meanwhile, part B has disadvantages regarding implementation or emerging green technology.

PART A: Advantages of implementation or emerging green technology

i) Reduce pollution

Statement	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The use of green technology can reduce odor pollution found around the UTEM area.					
Green technology is able to reduce the level of air pollution in the UTEM area					
More efficient disposal of solid waste can be done through the use of green technology					

ii) Reducing global warming

Statement	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Green technology is able to reduce the high heat rate in the UTEM area					
The use of green technology can					

reduce the excessive use of electricity					
The rate of carbon dioxide emissions into the atmosphere can be reduced					

PART B: Disadvantages of implementation or emerging green technology

i) Lack of finance support

Statement	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The tools used to create green technology are quite expensive					
Wages or the creation of green technology cost a lot					
The funds allocated by the university or the government are still insufficient					

ii) Lack of knowledge about green technology

Statement	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The lack of involvement of educational institutions in applying the knowledge of the use of green technology					
Lack of public relations role in promoting green technology					
Minimal use of social media in providing knowledge on green technology					

SECTION 3: WHAT ACTIVITIES CAN BE DONE TO MAKE SAFE ENVIRONMENT USING GREEN TECHNOLOGY

Emphasis on recycling and waste management to factories around UTEM

Strongly disagree	Disagree	Undecided	Agree	Strongly agree

Increasing recycling bins in every faculty

Strongly disagree	Disagree	Undecided	Agree	Strongly agree

Reduce the use plastic bag in every cafe or canteen to reduce the pile of plastic waste

Strongly disagree	Disagree	Undecided	Agree	Strongly agree

Harnessing solar energy to reduce global warming

Strongly disagree	Disagree	Undecided	Agree	Strongly agree

Hold more frequent campaigns or carnival about green technology in UTEM

Strongly disagree	Disagree	Undecided	Agree	Strongly agree

Collaborate with non-governmental organization (NGO) or renowned companies on the development of green technology

Strongly disagree	Disagree	Undecided	Agree	Strongly agree