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**THE IMPACT OF BOARD CHARACTERISTICS AND SUSTAINABILITY
STEERING COMMITTEE ON E-WASTE DISCLOSURE: A STUDY ON
MALAYSIAN PUBLIC LISTED COMPANIES**

**By
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**Thesis Submitted to
College of Business
Universiti Utara Malaysia
in Fulfilment of Requirement for the Master Degree in Science (Accounting)**



Kolej Perniagaan
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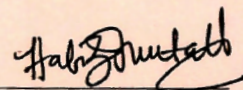
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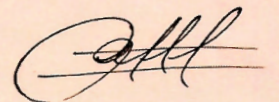
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ABSTRACT

In the past few years, the issue of e-waste has caught the attention of many due to its massive growth in volume. During the outbreak of Covid-19, more electronic devices such as laptops and printers were provided to employees so they could work remotely. Indirectly, this may cause the volume of e-waste generated to increase more than what has been expected. This study aims to address the issue of e-waste reporting in Malaysian public listed companies by examining the influence of board characteristics (size, independence, frequency of meetings, and gender diversity) and sustainability steering committees on the reporting of e-waste. E-waste has become a growing concern in Malaysia. There is a need for companies to be transparent in their reporting on e-waste management practices. Specifically, this study observed the extent and quality of e-waste disclosure. It also examined the level of e-waste disclosure between industries. Subsequently, this study also investigated if board characteristics and sustainability steering committee had any impact on e-waste disclosure. The sample consisted of all companies from Bursa Malaysia's main market. The findings indicated that the quality of disclosure appeared to be roughly in the middle of non-disclosure and general qualitative disclosure. According to this study, companies in technology and telecommunications sectors disclosed e-waste information more comprehensively and of higher quality than companies in other sectors. This study also revealed that board meeting frequency was the only board characteristic that significantly enhanced e-waste disclosure. In addition, there was a significant and positive relationship between the existence of a sustainability steering committee and e-waste disclosure. The findings of this study contribute to the aspirations in achieving environmental sustainability and sustainable development goals.

Keywords: E-waste disclosure, board characteristics, sustainability steering committee.

ABSTRAK

Dalam beberapa tahun kebelakangan ini, isu sisa elektronik telah menarik perhatian ramai kerana jumlah pertumbuhannya yang besar. Sewaktu penularan wabak Covid-19, syarikat telah menyediakan lebih banyak peranti elektronik seperti komputer riba dan pencetak kepada kakitangan mereka untuk bekerja dari jauh. Secara tidak langsung, ini boleh menyebabkan isipadu sisa elektronik yang dijana menjadi lebih tinggi daripada jangkaan sebelumnya. Kajian ini bertujuan untuk menangani isu pelaporan sisa elektronik dalam syarikat senarai awam Malaysia dengan mengkaji pengaruh ciri-ciri lembaga pengarah (saiz, kebebasan, kekerapan mesyuarat dan kepelbagaian jantina) dan jawatankuasa pemandu kemampanan ke atas pelaporan berkenaan sisa elektronik. Sisa elektronik telah menjadi kebimbangan yang semakin meningkat di Malaysia. Terdapat keperluan bagi syarikat untuk telus dalam melaporkan amalan pengurusan sisa elektronik. Secara khusus, kajian ini melihat sejauh mana tahap dan kualiti pendedahan maklumat sisa elektronik. Ia turut mengkaji tahap pendedahan maklumat sisa elektronik antara industri. Seterusnya, kajian ini juga menyiasat sama ada ciri-ciri lembaga pengarah dan jawatankuasa pemandu kemampanan mempunyai sebarang kesan ke atas pendedahan maklumat sisa elektronik. Sampel terdiri daripada syarikat dari pasaran utama Bursa Malaysia. Penemuan menunjukkan bahawa kualiti pendedahan kelihatan di anggarkan berada di antara tiada pendedahan dan pendedahan kualitatif umum. Menurut kajian ini, syarikat dalam sektor teknologi dan telekomunikasi mendedahkan maklumat sisa elektronik secara lebih komprehensif dan berkualiti tinggi berbanding syarikat dalam sektor lain. Kajian ini juga mendedahkan bahawa satu-satunya ciri lembaga pengarah yang meningkatkan dengan signifikan pendedahan maklumat sisa elektronik ialah kekerapan mesyuarat lembaga. Selain itu, terdapat hubungan yang signifikan dan positif antara kewujudan jawatankuasa pemandu kelestarian dan pendedahan maklumat sisa elektronik. Dapatan kajian ini menyumbang kepada aspirasi terhadap pencapaian kemampanan alam sekitar dan “*sustainable development goals*”.

Kata kunci: pendedahan maklumat sisa elektronik, ciri-ciri lembaga pengarah, jawatankuasa pemandu kemampanan.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

In this challenging era of globalisation, environmental problems are becoming increasingly significant. The world is concerned with these issues, especially with increasing pollution levels, poor waste management, and the depletion of the ozone layer. The negative consequences of not having environmental awareness over the previous years can be seen nowadays. For example, the world faces air pollution caused by emissions from factories, cars, planes, and aerosol cans, as well as electrical and electronic waste (National Geographic, 2011; Robinson, 2009). Studies have proven that environmental issues are critical and can cause natural disasters and worsen the health condition of people (National Geographic, 2011).

One of the primary causes of environmental problems is ineffective waste management. The poor management of electrical and electronic waste (e-waste) has recently received attention from academic studies and the media. Old electrical and electronic devices that emit dangerous substances into the waste stream are referred to as "e-waste" (Forti et al., 2020). A research by the United Nations University (UNU) revealed that, by 2050 the quantity of e-waste produced could have more than two times and could reach over 111 million tonnes annually (United Nations University, 2017). When the e-waste is not appropriately managed, there will be a mountain of e-waste in

landfills. One of the factors that contributing to this problem is improper management of the waste especially in recycling. It also has continuously increased the e-waste volume (Forti et al., 2020). Irresponsible action by some developed countries which shipped their e-waste to other countries also lead to poor waste management. For instance, a new article stated that 75 containers of e-waste were discovered entering Malaysia illegally from China and to be processed in Malaysia (BERNAMA, 2021). Fear has been raised due to this scenario that Malaysia might become the next world's e-waste dumping ground after India which have been illegal dump site up to 90% of the world's electronic waste (Walker, 2016). China also had the same misfortune as the global e-waste dumping ground and seemed to be the greatest e-waste dumping ground due to the fact that 70% of the electronic waste produced worldwide ended up in China (Watson, 2013). If Malaysia does not handle e-waste properly, it will encounter a similar problem.

Globally, the using of electrical and technological devices is increasing massively. Forti et al. (2020) revealed that the total weight of global e-waste generation has reach up to 2.5 million metric tons (Mt) on average from 51.8 million Mt in 2018 to 58.6 million Mt in 2019, which is enough for the e-waste to reach the moon and back twice. On average, 7.3kg of e-waste was generated per person sper year. Unfortunately, Asia developed the majority quantity of e-waste with 24.9 Mt, equal to 46.45% of the total e-waste has produced in 2019, followed by 12 Mt (16.2 kg per capita) in Europe and 13.1 Mt (13.3 kg per capita) in the Americas (Forti et al., 2020).

Under current situation, generation of e-waste might increase more than expected. From early 2020, due to the dangerous pandemic Covid-19 and lockdown, the world has been facing a new normal in communication and working in Information and

Communications Technology (Oludamilola & Friday, 2021). Even after the end of Covid19, the new norms are likely to stay as some technologies will continue to complement traditional physical contact. It is worrying that with the increment number of electronic and electrical equipment use as work from home working appliances nowadays, the number of improper managed e-waste will also increase more than 2019.

As for now, 82.6% of 44 Mt of e-waste generated are not appropriately documented and managed based of Forti et al. (2020) report. When the temperature increases, people tend to use cooling equipment more often. Then, there has been an incremental generation and usage of temperature exchange equipment, such as fridges, cooler fridge, and air conditioners, with an annual average of 7% (Forti et al., 2020). Increased number of e-waste has caused earth's average temperature to rise, and in some situations, it has also caused unpredicted rainfall (Holly, 2021). Consequently, this is yet another element that has contributed to the rise of e-waste. It is concerning that current e-waste management is inadequate and might eventually result in the worst case scenario for treating e-waste (Forti et al., 2020)

E-waste has become a crucial issue since e-waste negatively impacts the environment, human beings, and animals. Mercury, lead, cadmium, beryllium, PVC, and bromine are just a few of the dangerous substances found in e-waste (Department of Environment Malaysia, 2020). Every toxic substance is dangerous. For example, Cadmium is carcinogenic and when burnt, could damage soil health and ecosystem, while mercury is harmful to the body, brain and nervous system (Department of Environment Malaysia, 2020).

Studies have also found that being exposed with e-waste can cause an increase in spontaneous abortions and premature deliveries (Grant et al., 2013). Those who live and work in e-waste recycling towns exhibit more DNA damage (Grant et al., 2013). E-waste can also cause changes in thyroid function and impair lung function (Grant et al., 2013). Based on the following facts, it is clear that e-waste is hazardous and dangerous to the environment, humans and animals (Alabi et al., 2021; Grant et al., 2013). Therefore, effective e-waste treatment is essential for a healthy environment (Grant et al., 2013).

In this research, it aims to look into how committed businesses are in managing their e-waste. Specifically, this study attempts to gauge the commitment of listed firms from Bursa Malaysia to e-waste management as portrayed in their annual reports. To date, only listed firms in Malaysia's telecommunications and technology industries are obligated to disclose their e-waste information (Bursa Malaysia Securities Berhad, 2018a). This study observes the extent and quality of e-waste information disclosure by listed companies in all 14 industries because it is believed that every company produces e-waste, either in small or large volumes, especially during the pandemic Covid-19 (Borthakur & Govind, 2017; Lefebvre et al., 2011). According to a study by The State of Business IT, most companies in Europe (84%) made quick investments with average of 24% increase over the 2019 budget to offer new IT equipment for their staff to work from home since Covid 19 outbreak started (*The State of Business IT*, 2020).

The research also compares the extent of e-waste information disclosure by the compulsory industry (telecommunication and technology industries). Further, it will also investigate the factors contributing to e-waste information disclosure or reporting from the lens of the virtue ethics theory (Securities Commission Malaysia, 2021). In brief, this

study also contributes to Goal 11 and Goal 12 of Sustainability Development Goals, i.e., “to make cities and human settlements inclusive, safe, resilient and sustainable”. It also aims to achieve environmentally responsible e-waste management in order to create a sustainable consumption and production pattern. For example, every public listed company needs to contribute to proper e-waste management practices and to disclose such commitments in their annual reports. Other than that, every public listed company also can identify the e-waste management factors applied in their companies.

1.2 Problem Statement

Asia produced the most amount of e-waste in 2019 (24.9 Million tonne), and Malaysia itself produced 364 kilometric tonne (kt) of e-waste in that same year, according to the Global E-waste Monitor Report (Forti et al., 2020). According to the data, Malaysia produced 364 kt of e-waste in 2019 compared to 280 kt in 2016. Over the past three years, there has been a growth of 84 kt, or 1 kilogramme of electronic waste per person in Malaysia (Forti et al., 2020). Due to the growing amount of e-waste, inappropriate treatment, and landfill disposal, there are significant negative effects on the environment, human health, and other aspects. The mission to accomplish the Sustainable Development Goals, which aim to protect the environment for all by 2030 also has affected due to this problem (International Telecommunication Union (ITU), 2015).

Beginning in 2016, all publicly listed companies have been required to publish their sustainability commitments in response to the government's environmental commitment (Wong, 2019). It is because e-waste information disclosure is vital in ensuring proper e-waste management in a company. However, Nik Azman and Mohd

Salleh (2020) study has found low reporting of e-waste by public listed companies. There is only 7.5% out of 789 companies reported e-waste. In sustainability reporting guidelines, there is a specific part for environmental reporting and e-waste is one of the indicators that need to be reported (Bursa Malaysia Securities Berhad, 2018a). E-waste information disclosure is significant to ensure e-waste activities, including disposal, recycling, reusing and reducing, are properly managed.

Previous studies in the environmentally disclosure area have focused more on environmental reporting (Aliyu, 2019; Latif et al., 2020; Moalla et al., 2020; Shahab et al., 2020; Shwairef et al., 2021), despite the fact that e-waste concerns have been for a long, research on e-waste information disclosure is quite limited in this area.. There are a few studies on e-waste information disclosure (Nik Azman & Mohd Salleh, 2020). A study from Nik Azman & Mohd Salleh (2020) investigated firms' financial performance as the predictor for e-waste information disclosure from 2018 until 2019, while according to Abd-Mutalib et al. (2021) the firm and board characteristics have an impact on how much e-waste is reported. This research aims to fill a gap in the body of literature, particularly in sectors other than the technology and telecommunications sector, by focusing on e-waste information disclosure progress from 2019 to 2021 to assess how e-waste information disclosure has improved among Bursa Malaysia listed companies.

As environmental management is crucial in every business, involvement from management is needed. Given that directors have a fiduciary duty to monitor the company's strategy, risk, and capital allocation, the board of directors has a considerable impact in this area (Deloitte Touche Tohmatsu Limited., 2018). This study will specifically look at the effect of board characteristics on e-waste information disclosure

via the lens of the virtue ethics theory, which advocates moral excellence, goodness, chastity, and good character. There has not been much study has been done on this area of discussion. The virtue ethics theory exhorts the board to act morally by acting with goodness and to act intellectually by acting for the proper reasons (Annas, 2003). It demonstrates how a board with the finest qualities may result in excellent e-waste management.

Due to the board's involvement in corporate actions that affect environmental reporting in a firm, previous study has found that board size is one of the factors that impact environmental reporting (Barbu et al., 2014; Janggu et al., 2014; Latif et al., 2020; Shwairef et al., 2021). The size of the board of directors affects the organization's capacity, showing that the board's size has an effect on the organization's capabilities (Wincent et al., 2013). Greater intellectual capacity on larger boards facilitates decision-making, which improves both financial and non-financial performance (Hidalgo et al., 2011). Other than that, board independence has also been used as one of the characteristics. In previous studies, board independence has been shown to impact environmental reporting (Aliyu, 2019; Htay et al., 2012; Ienciu et al., 2012; Sallehuddin & Fadzil, 2013). The result from the research shown that independent boards will act more ethically and not be biased in decision-making. If an independent director manages the board's goals fairly, they can provide effective leadership (Securities Commission Malaysia, 2012).

Meeting frequency, or the number of meetings held by the board of directors, is another board characteristic that will be studied in this research (Ntim & Osei, 2011; Odoemelam & Okafor, 2018). Past studies have shown that with frequent meetings, the

quality of environmental disclosure will get better (Odoemelam & Okafor, 2018). The board meeting is a platform for all board members to exchange their knowledge and information. These meetings are a vital and necessary resource for the company to effectively discuss management issues (Aliyu, 2019). With more frequent meetings, it has been shown that more brilliant ideas from directors can be obtained. It can lead to making the right and ethical decisions with regard to e-waste disclosure. Lastly, board gender diversity also plays a role in environmental reporting (Al-Shae & Zaman, 2016; Aribi et al., 2018; Baalouch et al., 2019; Nadeem et al., 2017; Sartawi et al., 2014). According to Adams et al. (2015), ethical behaviour varies between men and women, and female directors have unique views and are more concerned with stakeholders. The likelihood of include more diverse information, ideas, and perspectives throughout the decision-making process increases when there is gender diversity on the board of directors (Post, 2015). As a result, board of directors may increase its performance and efficiency (Upadhyay & Zeng, 2014).

The sustainability steering committee will be included in the research model together with board characteristics in an effort to close a gap in earlier material. A sustainability steering committee may have an influence on environmental reporting, according to a few previous studies (Eccles et al., 2014; Garcia-Torea et al., 2016; Lau et al., 2016; Liao et al., 2015; Peters & Romi, 2011; Shwairef et al., 2021). Businesses may benefit from the assistance of a sustainability steering committee, a team of specialists, in creating plans to improve the social and environmental disclosure and performance (Biswas et al., 2018). Environmental reports can be properly prepared by experts (Lau et al., 2016). The sustainability steering committee is expected to perform the right thing

according to environmental disclosure requirements. According to the Malaysian Code on Corporate Governance, each publicly listed company must select a member of management who will be strategically focused on sustainability issues (Securities Commission Malaysia, 2021). The sustainability steering committee's contribution to increased environmental reporting and the publication of e-waste data has, however, received little research attention in Malaysia. Therefore, the objective of this research is to examine if the sustainability steering committee will have a good impact on e-waste information disclosure by following the new Malaysia Code on Corporate Governance 2020 requirement. Draw upon the virtue ethics theory, a sustainability steering committee will have a person in charge to be responsible for sustainability activities and doing the right thing for the right reason regarding environmental activities and reporting.

In conclusion, this research by drawing upon the theory examines the influence of board characteristics and the sustainability steering committee on the e-waste information disclosure. There is limited study regarding board characteristics in e-waste information disclosure. The effect of the sustainability steering committee on the disclosure of e-waste information in public listed companies also has not been studied before. Empirical study is required to address this deficiency to address the gaps identified in this research field.

1.3 Research Questions

- i. What is the extent and the quality of e-waste information disclosure of Malaysian Public Listed Companies?
- ii. Is there any difference in the extent of e-waste information disclosure by Malaysian Public Listed Companies according to industry?
- iii. Do board characteristics (board size, board independence, board meeting and board gender diversity) influence e-waste information disclosure in public listed companies in Malaysia?
- iv. Does the sustainability steering committee influence e-waste information disclosure in public listed companies in Malaysia?

1.4 Research Objectives

- i. To examine the extent and the quality of e-waste information disclosure by Malaysian Public Listed Companies
- ii. To examine if the level of e-waste information disclosure by Malaysian Public Listed Companies differs between industries.
- iii. To investigate if board characteristics have an impact on e-waste information disclosure by Malaysian Public Listed Companies.
- iv. To examine if the sustainability steering committee has an influence on e-waste information disclosure by Malaysian Public Listed Companies.

1.5 Scope of the study

This study investigates how board characteristics and sustainability steering committee affect an organization's disclosure of e-waste in Malaysia. Publicly listed companies on the Bursa Malaysia main market included in this study. The sample is selected because the main market is a prime market for established companies (Bursa Malaysia Securities Berhad, 2020). It is due to their ability as a large corporation. It is because, as a large corporation, they may have sufficient resources for commercial activities and may be utilising modern digital technology in their daily operations, such as more digital appliances and computers.

It is expected that board characteristics and sustainability steering committee play an essential role in e-waste reporting of an organisation. The good attributes of the board can lead to better e-waste reporting since it manages and makes decisions in an organisation. The virtue ethics theory will be used to understand how board qualities and the sustainability steering committee affect how Malaysian companies disclose their e-waste. This study uses secondary data from annual reports and relevant reports from 2019 to 2021, such as corporate governance and sustainability reports. All the reports are obtained from the company's official website and Bursa Malaysia. The number of public listed companies on the main market is 960 companies in 14 industries, including the construction industry, telecommunications industry, technology industry, financial services industry and health care industry.

1.6 Significance of study

This research will add to the body of knowledge since it examines significant board features and sustainability steering committee variables with regards to information disclosure about e-waste. The following are some specific reasons that this study will be significant:

1.6.1 Theoretical Significance

The results of this study may offer in theoretically fresh empirical understandings of the virtue ethics theory, and more specifically, the impact of board characteristics. Many researches have been carried out in developed nations (Bhattacharyya, 2014; Che Ku Kassim et al., 2019; Dobbs & van Staden, 2016; Moalla et al., 2020; Shwairef et al., 2021) and developing countries (Indrasari et al., 2021a; Malik et al., 2017; Odoemelam & Okafor, 2018; Suttipun & Stanton, 2012a), to find out the effect of board characteristics on environmental reporting. However, despite its impacts on environment and human health, very few studies have been conducted on e-waste disclosure by business entities. This research will add to the numerous attempts to better understand board characteristics. The study will also investigate the sustainability steering committee as a new variable and its influence on e-waste information disclosure. Moreover, most previous studies have used the agency theory as the research theory to justify board characteristics (Aliyu, 2019; Htay, 2012; Ienciu et al., 2012; Khalili & Azwan, 2020; Latif et al., 2020; Odoemelam & Okafor, 2018). The virtue ethics theory has only been applied in a small number of studies to explain how board characteristics and the sustainability steering committee relate. In conclusion, the study findings should contribute to closing this knowledge gap.

1.6.2 Practical Significance

To the best of the researcher's knowledge and experience, this study can contribute to Bursa Malaysia's sustainability policy. This study can measure the significance of the sustainability steering committee and the effect of board characteristics in the disclosure of e-waste information. The impact of board characteristics and sustainability steering committees on the disclosure of e-waste information in Malaysia has not been sufficiently demonstrated in prior studies. Nik Azman & Mohd Salleh (2020) did not focus on any board characteristics, while Abd-Mutalib et al. (2021) only focused on board size and gender diversity, and e-waste disclosure. Furthermore, this study will take place in the context of Malaysian business, which differs from studies undertaken in other business settings in some ways. As a result, many stakeholders in Malaysian corporate organisations, including regulators, investors, enterprises, and even employers, will benefit greatly from the practical contribution made by this study's findings. For instance, this enables companies to fill in information gaps and increase transparency in their e-waste reporting performance, regardless of how well they are performing or not. In addition, they can acquire the legitimacy and social acceptability they need to succeed by demonstrating their social commitment, accountability, and long-term behaviour. E-waste reporting may help improve and make green investing more transparent, as companies that properly treat and disclose their e-waste have a greater chance of attracting green investors. This study also can enhance Malaysia to achieve the Goal 11 and Goal 12 from 17 Sustainable Development Goals (SDGs) in 2030.

1.6.3 Methodological contribution

To the e-waste information disclosure approach, this study will also offer a significant methodological contribution. Past studies have focused on e-waste information disclosure with the information extracted from the “Environmental, Social, and Governance” (ESG) reports on the aspect of the environment (e-waste reduction) reporting (Nik Azman & Mohd Salleh, 2020). Each company's e-waste reduction score was reported, along with an assessment based on the company's initiative to join 3R “ Recycle, Reuse, Reduce”, substitute, treat, or phase out e-waste (Nik Azman & Mohd Salleh, 2020). However, this study focuses on the extent and quality of e-waste information disclosure that are not measured in previous studies. The extent of e-waste information disclosure will be measured using two metrics: (1) the number of words in the report about e-waste, and (2) the number of sentences in the report. To assess the quality of e-waste information disclosure, 4- point quality index of measurement of disclosure index will be used.

1.7 The organisation of Study

The remainder of the study will be covered in the next sections. Review of the literature on environmental disclosure and e-waste is presented in Chapter 2. The development of hypotheses and the methods for conducting the study are covered in Chapter 3. Reporting and discussing the findings will be in Chapter 4. In Chapter 5, the conclusion and recommendations are presented.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The relevant literature on e-waste, e-waste research, and e-waste information disclosure is reviewed in this chapter. It also sheds light on the characteristics of the board, including its size, independence, meetings, and gender, and discusses how these factors affect environmental reporting. The impact of the sustainability steering committee on environmental reporting is also highlighted in the discussion, which is followed by the theory employed in this study.

2.1.1 Electrical and electronic waste

Electrical and electronic waste is known as "e-waste." E-waste is self-explanatory in the sense that it is an acronym for electronic waste. The concept heavily relies on the word "waste." It logically suggests that the thing has no utility going forward and that its owner considers it to be excess or useless in its current condition (The Step Initiative, 2014). E-waste can also be known as broken, non-working, obsolete electronic appliances, such as electric cooker, toaster and refrigerators. Domestic e-waste refers to e-waste generated by households, companies, and institutions, whereas industrial waste refers to e-waste generated by manufacturing or industrial activity (Department of Environment Malaysia, 2020). Industrial e-waste mostly consists of electrical and electronic scrap produced by businesses (for example, discarded copper wires). However, domestic e-waste is created by both homes and businesses (Suja et al., 2014).

Electrical and electronic equipment includes a wide range of devices containing circuitry or electrical components, as well as a power source or battery (The Step Initiative, 2014). Most homes and workplaces have essential kitchen equipment, toys, musical instruments, and information and communication technology (ICT) tools like computers and cell phones (Forti et al., 2020). In addition to typical household and corporate use, electrical and electronic equipment is widely employed in transportation, health, security, and energy producers, such as photovoltaics are increasingly containing electronic components, contributing to the global e-waste problem (Forti, 2020).

A total of 280,000 tonnes, or 8.8 kg of electronic garbage per person, were created in Malaysia. E-waste is only anticipated to rise as Malaysia moves from a middle-high to a high-income nation (Forti, 2020). Department of Environment has taken responsibility to manage e-waste. Industries that produce e-waste use the electronic scheduled waste information system (eSWIS) to monitor the development, collection, storage, disposal, and recovery of scheduled e-waste before transferring it to recovery facilities (eSWIS, 2018). Every piece of e-waste contains various of dangerous materials that need to dispose of and recycled in various ways. If improperly handled, it may harm the environment and peoples lives in a number of ways (Forti, 2020).

Other than that, The Communications and Multimedia Commission (MCMC) implemented the “Small Information Technology and Telecommunication Devices Recycling Project (KITAR)” in September 2021 to promote recycling, particularly with regard to e-waste (The Sun Daily, 2021). E-waste collection stations have also been established in accessible areas by the MCMC. They also hope to educate consumers on the dangers of improperly disposing of electrical and electronic equipment to persuade

them to properly dispose of their old phones (Malaysian Communications and Multimedia Commission, 2018; Otto et al., 2018).

Dangerous and harmful substances from toxic metal and chemical substances are produce by e-waste. One of the primary reasons for adequately handling and recycling household e-waste is due to its severe impacts on health and the environment (Department of Environment Malaysia, 2020). For example, the open burning of e-waste can discharge dangerous compounds into the atmosphere, including dioxins, polycyclic aromatic hydrocarbons, and heavy metals. E-waste can also leak hazardous compounds like lead and mercury that can cause contamination of neighbouring soils, surface water, and groundwater. People who live near e-waste disposal sites may be exposed to the emitted pollutants (Brusseau et al., 2019). The materials and components that might be in the e-waste are shown in Table 2.1

Table 2.1

Material and Components of E-waste

Materials And Components
Batteries
Cathode Ray Tubes (CRTs)
Mercury- Such as In Switches
Toner Cartridges, Liquid and Pasty, As Well As Colour Toner
Printed Circuit Boards
Capacitors In Polychlorinated Biphenyl (Pcb)
Liquid Crystal Displays (Lcds)
Halogenated Flame Retardants in Plastics
Crc Hcfc Or Hfcs
Gas Discharge Lamps

Other than that, e-waste can cause many damages to a human being via routes such as ingestion, inhalation, and direct contact with e-waste. A study by Alabi et al. (2021) found that children, pregnant women, and workers at primitive recycling plants are the most susceptible to e-waste damage. A study by Grant et al., (2013) also shows that DNA damage has been caused to more people who lived or worked in e-waste recycling towns rather than those in control towns. In two Delhi junkyards, a research by Kowsar et al. (2010) studied the influence of e-waste recycling on workers' and others' health. According to this study, injuries, burns, and skin disorders were identified on 90% of the hands, faces, and legs. Table 2.2 summarises the result of this study on the health conditions of workers engaged in this activity (Kowsar et al., 2010).

Table 2. 1

Health Condition of Workers

Diseases and symptoms	Percentage of workers (%)
Respiratory tract irritation	30.2
Kidney and blood infections	11.1
Symptoms of lung cancer	6.3
Nervous breakdown and brain diseases	3.2

The achievement Goals in Sustainable Development Goals in Goal 3 “Good health and well-being”, Goal 6 “Clean water and sanitation” and 12 “Responsible Consumption and Production” is directly correlated with improved knowledge of and management of e-waste. Goal 3 states that amount of diseases and fatalities caused by the production of dangerous chemicals and pollutions, such as air pollution, can be decreased with a proper

procedure of managing e-waste. At the same time, Goal 6 states that it can aid in achieving universal and equitable access to clean, affordable tap water for all people. In addition, Goal 12 can be met by appropriately managing e-waste to lessen its negative effects on both human health and the environment. It can be accomplished by environmentally responsible management of all trash and chemicals over their entire life cycles (United Nation, 2021). Even though e-waste disclosure is very important in order to achieve this goal, unfortunately, research on e-waste disclosure in Malaysia are still limited. E-waste needs more attention and focuses from every industry because every sector contributes to e-waste production in a significant volume or small volume.

2.1.2 E-waste Research in Malaysia

E -waste management has been discussed in Malaysia (Ismail & Hanafiah, 2021; Suja et al., 2014). Malaysia has taken steps like gathering information and data on e-waste generation, implementing rules and procedures, and only permitting facilities with licences to treat and recover e-waste (Suja et al., 2014). On the other hand, Suja et al. (2014) asserted that stricter regulations are needed to ensure that all e-waste is gathered, cleaned, and recovered by approved facilities. It is important to establish standards to ensure that technologies are safe for the environment and those who handle e-waste.

The handling of e-waste in Malaysia has to be monitored and planned for in the future. Ismail & Hanafiah (2021) identified alternatives for managing e-waste in Malaysia, including landfill disposal, direct burning with energy recovery, materials recovery with and without energy recovery. The life cycle assessment (LCA) and material flow analysis (MFA) are used to analyse these choices. The study found that, among the four e-waste

treatment methods examined, direct incineration with energy recovery is the most effective (Ismail and Hanafiah, 2019).

Other than that, a study by Mahat et al., (2019) found e-waste disposal awareness in the Malaysian community. The study's goal is to determine how much people in Malaysia know about e-waste disposal. This poll included 500 respondents from nine districts around Selangor. According to the findings, respondents reported a high level of e-waste disposal knowledge and attitudes but only a medium level of e-waste disposal behaviour.

Besides that, Shahrudin et al. (2020) studied the factors that caused Malaysian youth's intentions to dispose of e-waste. 400 surveys were distributed to Malaysian youth in Putrajaya and found that perceived convenience and policy effectiveness have a considerable beneficial impact on the reason to dispose of portable e-waste.

A study about the intention of Malaysian public to recycle e-waste has been found (Mohd Noor, 2023). The purpose of this study is to ascertain the degree to which knowledge, incentives, and attitudes may affect people's intentions to recycle e-waste in Malaysia. The results show a significant positive relationship between information, incentives, attitude, and e-waste recycling intention. The findings also indicate that the most important element affecting the public's tendency to recycle e-waste is incentives.

Other than that, a study about examining family intentions to donate mobile phones to collection boxes in Malaysia has been reported Afroz (2020). This study added environmental awareness and knowledge to the concept of planned behaviour. Additionally, two components of the perceived behavioural control were examined, including the disposal expense and the accessibility of the disposal infrastructure. As the

result, it shows that environmental awareness and knowledge significantly influence household attitudes towards recycling intentions. Additionally, it was discovered that household intention is positively correlated with attitude and the cost of disposal infrastructure.

A few studies on e-waste information disclosure have been carried out in Malaysia. For example, Nik Azman and Mohd Salleh (2020) and Abd-Mutalib et al. (2021). The research by Nik Azman and Mohd Salleh (2020) investigated the connection between company performance and the reporting of e-waste information. Return on Equity and Return on Assets have been used as the independent variables to quantify corporate success. The study used Malaysian public listed companies in 2018 as the research sample. The research found no significant relationship between Return on Asset, Return on Equity and the e-waste information disclosure, which means other factors, such as board qualities, regulatory policies, and company size, may influence e-waste information disclosure (Nik Azman & Mohd Salleh, 2020).

Meanwhile, the influence of firm and board characteristic on disclosure of e-waste information has been discovered (Abd-Mutalib et al. 2021). The studies only include board size, board performance, board gender diversity, and company size as study variables. The research also discovered that company size has a strong link with e-waste disclosure, implying that large organisations are more likely to reveal e-waste data than small companies (Abd-Mutalib et al., 2021). From all the previous study, there is gap in e-waste information disclosure and board characteristics in Malaysia. Research in this field is very limited.

2.1.3 Environmental and E-waste Information Disclosure

The business sector is under growing pressure to provide more information about its operations' environmental effects (Uwuigbe, 2011). As a result, environmental reporting has become an issue of the national and worldwide discussion. Many types of research have been conducted on environmental reporting worldwide. Studies have been carried out in developed and developing countries (Bhattacharyya, 2014; Che Ku Kassim et al., 2019; Contrafatto, 2014; Dobbs & van Staden, 2016; Indrasari et al., 2021a; Malik et al., 2017; Moalla et al., 2020; Odoemelam & Okafor, 2018; Shwairef et al., 2021; Suttipun & Stanton, 2012b; Yunusa et al., 2016). Most studies use public listed companies in their country as the research sample (Bhattacharyya, 2014; Contrafatto, 2014; Indrasari et al., 2021a; Malik et al., 2017; Shwairef et al., 2021; Suttipun & Stanton, 2012b; Yunusa et al., 2016). There are prior studies that used different samples in the research, such as multinational companies (Moalla et al., 2020), local governments companies (Che Ku Kassim et al., 2019), and public listed companies (Odoemelam & Okafor, 2018). Previous studies have shown mixed findings of the extent of environmental reporting. Some developed companies have good disclosure of the environment, which is more than 70% of the companies sample disclosed their environmental reporting (Bhattacharyya, 2014; Che Ku Kassim, 2019; Dobbs & van Staden, 2016; Moalla et al., 2020). In contrast, most developing countries have poor e-waste information disclosure in the samples of the studies (Indrasari et al., 2021b; Malik et al., 2017; Odoemelam & Okafor, 2018; Suttipun & Stanton, 2012b). E-waste information disclosure is also at a minimum, especially in the public listed businesses sector (Nik Azman and Mohd Salleh, 2020; Abd-Mutalib et al., 2021).

To improve the environmental reporting in Malaysia, Bursa Malaysia had made a change several years ago. The Bursa Malaysia Sustainability Reporting Guidelines 2nd Edition 2018 has emphasised the importance of companies disclosing their electronic waste activities in the telecommunications and technology industries to demonstrate their environmental commitment (Bursa Malaysia Securities Berhad, 2018a).

2.1.4 Board Characteristics and Environmental Reporting

As there is limited prior studies on e-waste information disclosure, studies on environmental reporting will be revised since it is the most relatable to e-waste information disclosure and e-waste information disclosure is part of the environmental disclosure.

2.1.4.1 Board Size and Environmental Reporting

Previous research has looked at how the size of the board affects environmental reporting. Previous studies from Janggu et al. (2014) and Latif et al. (2020) have been using agency theory as the research theory to predict the impact of board size on environmental reporting, because agency theory assumes that principals and agents have separate ownership and control (Jensen & Meckling, 1976). Companies should have a solid corporate governance framework that aligns the principals' and agents' goals while decreasing agency costs (Latif et al., 2020). As a result, having a large enough board of directors can help with dispute resolution and voluntary environmental disclosures.

Previous study shows that company with more significant number of board will enhance environmental reporting due to the knowledge shared by directors in the company (Barbu et al., 2014). Larger boards usually to have greater experience, financial

expertise, and problem-solving skills, all of which may improve a company's reputation (Ntim, 2015). As a result, the board's ability to analyse and recognise opportunistic managerial behaviour increases (Elmagrhi et al., 2016; Mallin et al., 2013).

In the Malaysian context, board size is one of the board features that affect environmental reporting disclosure (Janggu et al., 2014; Latif et al., 2020; Shwairef et al., 2021). The size of a company is frequently used to reflect its visibility, but it can also indicate its financial capabilities to engage in social responsibility and environmental activities (Joshi et al., 2011). According to certain research, the size of the board has a favourable effect on environmental and sustainability disclosure (Janggu, 2014; Shwiref et al., 2021). Other research has discovered that larger boards may significantly influence environmental reporting (Buniamin et al., 2008). Corporate transparency can be fostered when a business has a big board of directors because of the available resources and pool of expertise (Hidalgo et al., 2011). The organization's broader board effectively builds its relationship to its environment while conserving scarce resources. A larger board of directors includes experts with a wide range of experience who provide professional counsel to management on critical topics. It is possible for the senior management to control the board of directors. It proves that having a larger board increases value.

Furthermore, because highly ethical members are more likely to influence ethics disclosure, a larger board is more receptive to it (Sankara et al., 2017). It shows that larger board members can drive virtuous business conduct and promote an ethical corporate culture. It will also lead to a positive relationship with voluntary disclosure (Abeysekera, 2010; Allegrini & Greco, 2013).

Despite the findings above, previous studies show a different perspective of the impact of large board size towards the board on environmental reporting (Aliyu, 2019; Azlan & Roszaini, 2011; Ienciu et al., 2012; Latif et al., 2020; Wan Abdullah et al., 2012). However, despite the fact that the findings are inconclusive, numerous research do demonstrate that there are differences. According to Weisbach (2013), larger boards are significantly less effective than small boards because when a board has a large number of members, agency issues may occur since some directors may join as free riders. It is improbable that a board of directors with more than seven or eight members will operate effectively. This is due to the fact that in bigger groups, decision-making, coordination, and communication are frequently hindered. Therefore, the final decision will be made by top management (Florackis, 2008).

The effect of board size on environmental reporting, however, has been the subject of conflicting study in the past. Future research will make use of alternative settings because studies on the impact of board size on environmental reporting are already overloaded and saturated. It will be studied whether board size affects the disclosure of e-waste information.

2.1.4.2 Board Independence and Environmental Reporting

Board independence is a useful indicator of how well the board is being monitored because it examines the competence of the persons who serve on it. The board of directors is directly responsible for developing and implementing business strategy and for overseeing the company's daily operations (Weir & Laing, 2001). An independent director can give effective leadership by honestly marshalling the board's priorities (Securities Commission Malaysia, 2021). This character is crucial as the foundation for making good

decisions and ethical responses. Independent directors are meant to represent the stakeholders' interests (Bursa Malaysia Securities Berhad, 2020). Requirements for Listing on the Bursa Malaysia Part A of Practice 5.2 states that independent directors must make up at least half of a listed company's board of directors or the majority of a large company's board of directors (Securities Commission Malaysia, 2021). If the chairman is not someone who is able to fairly share power and authority, the board must include a sizable number of independent directors (Securities Commission Malaysia, 2021). Such board members' supervision responsibilities are more closely aligned with authorised standards, rules, and regulations (Peters & Romi, 2015). The board's virtuous character is also expected to lead to correct behaviour in adhering to laws, rules, and regulations. The extent of environmental reporting disclosures must be determined with consideration for the independence of the board of directors. The purpose of independent directors is to encourage other directors to voluntarily provide stakeholders with more information about the company (Sallehuddin & Fadzil, 2013).

Previous studies show that independent board positively impacts environmental reporting (Aliyu, 2019; Htay et al., 2012; Ienciu et al., 2012; Sallehuddin & Fadzil, 2013). It demonstrates that more independent non-executive directors have a considerable influence on the clarity of environmental reporting (Ienciu et al., 2012). It demonstrates how more impartial board members might avoid conflict of interest problems in environmental reporting. A board member's likelihood of disclosing environmental information increases with their level of independence (Htay, 2012; Sallehuddin 2013). The fact that independent non-executive directors have a desire to demonstrate their credentials as experts explains why boards with more of them are thought to be more

successful. Additionally, having more independent directors allows for more effective oversight and control the management in the company (Fama & Jensen, 1983). Independent boards serve a crucial role in an organisation since they are required to represent the interests of other stakeholders of the company. As a result, independent outside directors may function as a representation of multiple stakeholder groups as well as boost shareholder efficiency (Elmagrhi et al., 2016; Ntim & Soobaroyen, 2013). As they bring to company boards a larger range of expertise, abilities, and commercial relationships (Ntim & Soobaroyen, 2013). As a result, the board is predicted to act ethically in an affective and brilliant way on behalf of stakeholders with their experiences, knowledge and skills. It is anticipated that they will have a greater impact on environmental reporting (Haniffa & Hudaib, 2006).

However, interestingly, this is contrary to the finding of a number of prior studies which found a negative association between board independence and environmental reporting (Barako et al., 2006; Buniamin et al., 2008; Razak & Mustapha, 2013; Shwairef et al., 2021; Wan Abdullah et al., 2012). There are also prior studies that found no significant relationship between board independence and environmental reporting in Malaysia, based on prior studies (Buniamin et al., 2008; Razak & Mustapha, 2013).

Previous study on the impact of board independence on environmental disclosure has shown conflicting results, and further research may be necessary in a different context. In this study, the effect of board independence on the disclosure of e-waste information by Malaysian public listed firms will be explored. Environmental reporting includes the disclosure of e-waste information.

2.1.4.3 Board Meeting and Environmental Reporting

A board meeting is an assembly of a business's directors when significant decisions on the operations and policy of the firm in the future are discussed. Actions taken or to be taken on behalf of the corporation are decided upon or approved by the board of directors. The frequency of board meetings is a measure of board activity, according to Aliyu (2019).

The board meeting is examined to ascertain the board's dedication to the company. A non-financial measure of the director's performance is the board of directors' attendance at the meeting (Hodge & Piccolo, 2005). The board meeting has enhanced disclosure quality nearly always, increased board oversight and scrutiny, decreased agency costs and information asymmetry (Chou et al., 2013). It implies that board policies, such as satisfying requirements, have an influence on the board's capacity to evaluate reports in order to address agency issues and raise transparency standards (Knechel, Robert W; Salterio, 2017; Xie et al., 2003).

Similarly, more frequent board meetings are connected to ethical corporate social responsibility reporting (Sankara et al., 2017). Thus, the board can inspire a good character to buffer a potential crisis during the meeting. This shows that board meetings can enhance ethical acts in disclosing commitment and quality.

A board meeting has a beneficial association to environmental reporting (Odoemelam & Okafor, 2018). Previous study stated a relationship between a board meeting and environmental reporting disclosure. The study has been done on non-financial companies in Nigeria from the 2015 annual report. It shows that when the board meeting is frequently

held, the board can focus on the current issues, including environmental issues, environmental strategies, performance, and reporting (Odoemelam & Okafor, 2018). Board meetings can positively impact environmental reporting because they allow directors to stay informed and up to speed on important changes inside the firm, allowing them to handle developing critical concerns more quickly (Mangena et al., 2012). The board can discuss and content with a new set of strategies, more time to confer and appraise managerial performance (Vafeas, 1999a).

Despite prior evidence, a few studies show disagreement with the positive relationship between a board meeting and environmental reporting (Khalili & Azwan, 2020; Siman et al., 2019). A study has found board meeting has an insignificant relationship with environmental disclosure in the plantation industry (Siman et al., 2019). A study based in Malaysia also resulted in the same finding of the frequency of board meetings and environmental disclosure (Khalili & Azwan, 2020). The lack of significance between a board meeting and environmental reporting may be attributed to the absence of significant discussion within the little time that directors spend together in a board meeting (Vafeas, 1999b). Routine tasks, such as presenting management reports and various formalities, consume a large portion of the meetings, reducing the time outside directors have to oversee management effectively (Lipton & Lorsch, 1992). It can have negative impact on environmental reporting.

Board meetings can significantly or insignificantly affect environmental reporting, according to prior studies. As the influence of board meetings is not conclusive towards environmental disclosure, further research in the context of e-waste information

disclosure will be done in this study. This research will find out the impact of the board meeting on e-waste disclosure.

2.1.4.4 Board Gender Diversity and Environmental Reporting

Diverse perspectives on the board add to a wide range of experiences and information, allowing for better strategic decision-making. As a result, gender diversity on boards became a well-known trait (Mahmood et al., 2018; Pechersky, 2016). If the board of directors is gender diverse, it is more probable that different types of expertise, ideas, and viewpoints will be included in the decision-making process (Post et al., 2015). It will improve the companies' performance and efficiency (Mahmood et al., 2018). In France, the law mandated half of the gender parity on the boards of all public companies by 2015 (Post et al., 2015). However, in Malaysia, MCCG has recently updated one of the requirements for public listed companies in Part A, guidelines 5.9, that stated at least 30% of the directors on all boards should be women (Securities Commission Malaysia, 2021). Numerous studies have demonstrated the commercial logic for board gender, notably existence of women on boards. If a board's female representation is less than 30%, the board must state what efforts it has taken or plans to take to get it to 30% or greater and the timeframe for doing so. A reasonable timeline is three years or fewer (Securities Commission Malaysia, 2021).

Men and women act ethically in various ways, according to Adams et al. (2015). Male directors are less concerned about stakeholders than female directors, who have their own ideals. The level of sustainability reporting is raised when there are female directors on a board of directors (Al-Shaer & Zaman, 2016). This enhanced supervision by female

directors improves companies disclosure (Aribi, 2018; Liao et al., 2015; Sartawi et al., 2014). According to Post et al. (2011), female directors exhibit more social responsibility. It demonstrates that women directors possess virtue as a personal quality, and that virtue may inspire positive behaviour. Business performance is improved financially and attempts to address other sustainability concerns, such as environmental performance, are coordinated when there are more women serving on boards of directors, according to Baalouch et al. (2019). Female directors consequently have positive associations between the standard of environmental disclosure and corporate sustainability initiatives (Khalili & Azwan, 2020; Nadeem et al., 2017). According to a Malaysian study reported by Khalili and Azwan (2020), The effectiveness of the sustainability reporting is connected with the proportion of female directors on a board.

Furthermore, because women are more likely to prioritise and symbolise taking care of others' needs in their activities and employment, it can enhance sustainability reporting disclosure when they hold important decision-making positions (Fernandez-Feijoo et al., 2014). Increased female representation on boards improves the board's ability to manage stakeholders and promotes the adoption of sustainable practises for climate change reporting (Ben-Amar et al., 2017). Women are more likely than males to recognise and behave ethically in the circumstances requiring ethical judgement, and some suggest that hazard (Post, 2011).

Nevertheless, Yusoff et al., (2016) found a non-relationship between the board gender and environmental reporting. The study stated that both genders had an insignificant influence on environmental reporting disclosure in non-financial companies from 2011 until 2013 in Malaysia. Evidence of prior studies on the association between

board gender diversity and sustainability reporting is not conclusive and need further research in a different setting. This variable will be used as one of the board characteristics to determine the influence on e-waste information disclosure.

2.1.5 Sustainability Steering Committee and Environmental Reporting

The board sub-committee in environmental issues is known as the sustainability steering committee. The sustainability steering group's duties and tasks include advising management on strategy development and frequently evaluating sustainability performance (Eccles et al., 2014). The sustainability steering committee assists businesses in developing, implementing, and systematically reviewing sustainability policies. It also analyses its sustainable growth partnerships and relationships and its sustainable growth communication and marketing methods (Liao et al., 2015).

The board needs to appoint committed persons within management to strategically manage sustainability, including incorporating sustainability issues into the company's operations (Securities Commission Malaysia, 2021). This code is intended to ensure a specific member disclose environmental reporting in their companies. As the result, the environmental reporting will be more details and well reported for the company.

For the board of directors and its committees to successfully carry out their numerous duties and obligations, there should be a right balance of talents, experience, independence, and sector expertise (Liao, 2015). The board of directors appointed a sustainability steering group that would bring experience, independence, and knowledge to the company's sustainability initiatives and disclosure. The sustainability steering committee's work responsibilities have exposed the group to positive characteristics that

are often utilised to determine how morally decent a person is (Kantudu & Samaila, 2015). It shows that the sustainability steering committee enables the companies to perform the right things that are ethical for the companies and the environment.

Board role influence can increase environmental reporting by enhancing a company's duty to society and the environment through appropriate environmental reporting disclosure by competent managers (Shahin & Zairi, 2007). Previous studies found that the environmental disclosure would perform better with the environmental committee (Eccles et al., 2014; Garcia-Torea et al., 2016; Lau et al., 2016; Liao et al., 2015; Peters & Romi, 2015; Shahin & Zairi, 2007). Previous studies found that improving environmental reporting through an effective board significantly reduces knowledge asymmetry. In order to increase environmental transparency, it was advised that companies establish an environmental committee on its board of directors (Yahaya, 2022).

According to Peters and Romi (2011), an environmental committee may be just as important for environmental disclosure as an audit committee. According to another study, the environmental committee may help staff members better grasp the environmental implications of the work and the responsibilities to mitigate any negative effects. Based on psychology's learning theory, which sees all behaviour as the result of observations and adaptations, Arjoon (2010) has proven this point of view. It proven that values can be successfully taught to people. Individuals can acquire virtuous attributes through adapting to their environment and gaining new skills. These committees also can set ambitious goals and monetary and non-monetary incentives to encourage employees to take action and inspire changes that improve the organisation's adaptability (Dietz et al., 2007).

Aside from that, as an expert group, the sustainability steering committee can utilise its knowledge and experience to help firms improve their social and environmental performance (Biswas et al., 2018). Recent evidence shows that having independent directors with prior experience and awareness of environmental concerns on the sustainability steering committee positively impacts the Dow Jones Sustainability Index (DJSI) (Del Valle et al., 2019). It is also, having an independent board and experienced person in sustainability steering committee can give an advantage in the effectiveness of sustainability steering committee.

However, a number of studies discovered that the sustainability steering committee really had a favourable impact on environmental reporting. Sustainability steering committees have a negligible impact on corporate social responsibility reporting in shariah-compliant businesses in the Jakarta Islamic Index (JII) and FTSE Bursa Malaysia Hijrah Shariah Index (FBHMI), according to a research by Muntaha & Haryono, (2021). Limited companies in the shariah-compliant sector appoint sustainability steering committees in companies (Muntaha & Haryono, 2021). The sustainability steering committee has little impact on corporate social responsibility reporting, according to an empirical research by Vu & Buranatraku (2018).

The previous study shows a mixed finding of the influences of sustainability steering committees towards environmental and environmental reporting. However, studies on sustainability steering committees are still limited and new in environmental reporting research field. The sustainability steering committee will be used in this study to measure e-waste information disclosure.

2.2 Research theory

2.2.1 Discussion Of Theories Used in Research Accounting and Sustainability.

The first theory commonly used in accounting and sustainability studies is agency theory. The assumptions behind agency theory are asymmetric information, opportunism, and a potential conflict between managerial and stockholder interests. As a result, managers must be controlled or monitored to guarantee that their efforts maximise investor wealth (Fama & Jensen, 1983). The board of directors is viewed as the ultimate vehicle of corporate control in the agency theory paradigm. When making choices on the future of the company, the boards act as the principal on behalf of the owner, supervising and evaluating the agent (management) (Siman et al., 2019).

Foundation of agency theory defined that companies should have an effective corporate governance structure in place that unifies the objectives of the principals and agents while minimising agency costs (Latif et al., 2020). As a result, having a sufficient number of board members may help to mediate conflicts and increase voluntary environmental disclosures (Latif et al., 2020).

According to Solomon's agency theory (2007:82), the presence of independent non-executive directors on the board of directors can assist in lowering agency costs by reducing the conflict of interest between shareholders and the company's management because they are tasked with overseeing the board independently, increasing objectivity and independence (Ienciu et al., 2012). Additionally, according to agency theory, Sallehuddin & Fadzil (2013) found that independent non-executive directors are tasked with monitoring management to ensure that the purpose to running the business is not

involving any personal interest. In other words, non-executive independent directors will assist in disclosing corporate social actions, particularly in annual reports. As we know, board members' supervision responsibilities are more closely aligned with authorised standards, rules, and regulations. This aligns with the agency hypothesis, according to which independent board members would be able to oversee managers' self-interested behaviour and reduce agency costs (Peters & Romi, 2015).

Other than that, the legitimacy theory is also one of the typically employed theories in social and environmental reporting research (Buniamin et al., 2008; Haladu & Bt. Salim, 2016; Ofoegbu et al., 2018; Shwairef et al., 2021). The existence of 'legitimacy' is defined as a link between an organization's operations and public expectations. The strategy is based on the concept of a "social contract," which limits an organization's behaviours to those prescribed by society (Gray et al., 1996). In essence, the organisation will continue to operate and receive support from stakeholders as long as its operations are safe or, at the very least, useful to society. Otherwise, the organisation must close the "legitimacy gap" by enhancing its current performance, altering societal expectations, altering how the general public perceives its performance, or deflecting the general public's attention from the current problem (Lindblom, 1994). When there is a 'legitimacy gap,' one of the most effective strategies for educating stakeholders is disclosure in the company report. It also shows that the legitimacy theory is considered to be a valid explanation for the sudden increase in environmental disclosure that has occurred recently as businesses aim to operate more sustainably (Braam et al., 2016; Lan et al., 2013; Prasad & Kalro, 2020).

The stakeholder theory also used for explaining environmental reporting practices. This theory has been used in several studies (Boiral, 2013; Deegan & Blomquist, 2006; Depoers et al., 2016; Haniffa & Hudaib, 2006; Mahmood et al., 2018). The normative stakeholder theory and the empirical stakeholder theory are two strands of theory (Gray et al., 1996). The normative stakeholder theory, which is the more applicable of the two theories, contends that an organisation (which includes all parties interested in a company's environmental performance, such as NGOs, the government, and the general public) will report on the environment merely because the "environment" is one of its many stakeholders with information needs that must be satisfied. It necessitates recognising and identifying the relationship between a company's activities and their effects on its stakeholders. The stakeholder theory's point of view considers the environment of the company, which includes clients, partners, employees, and other members of society. Due to this relationship, the company is dependent on the backing of its stakeholders in order to exist and prosper. The link needs to be managed if the corporation sees the stakeholders as being important. Giving information through voluntary social and environmental disclosures to obtain support and consent from many stakeholders is one way to maintain that relationship. Stakeholders with authority, urgency, and validity determine these enterprise stakeholders and their lobbying decisions (Ahmad, 2015).

It may be said that the explanations of social and environmental effect disclosure procedures are dominated by the theories of agency, legitimacy, and stakeholder. These hypotheses, however, have already received sufficient attention and research for our study. In this study, a non-typical theory will be used to explain the influence of board

characteristics and the sustainability steering committee on the disclosure of information about e-waste from a fresh perspective and to give different insight and conclusions that may guide practise. and contribute to the body of knowledge.

2.2.2 Virtue Ethics Theory

The core of the virtue ethics theory is the pursuit of moral excellence, goodness, purity, and great character. Virtue is a way of thinking that influences how one behaves in a certain situation. In the sense that a practise could be thoughtless, it is not a habit (Annas, 2003). The affective and intellectual components of this idea are presumably connected. According to virtue theory, doing the right thing while feeling good is known as the affective idea, while doing the right thing for the right reason is known as the brilliant idea (Annas, 2003). Other than that, intellectual virtues are closely linked to this ability to consider various facts. They have the distinct value of being intellectual and practical simultaneously (Alejo Jose et al., 2015). These virtues' intellectual activity necessitates study and meditation on concepts and principles, realising that this act must be of content and goodness (Alejo Jose et al., 2015).

This theory encourages any individual to perform the right thing. It is stated that virtues are directly related to knowledge and relevant reason (Alejo Jose et al., 2015). While morality encourages doing the right thing and feeling good, intellectuality encourages doing the right thing for the right reason (Abdullah & Valentine, 2009). The focus of virtue ethics is on the formation of moral character to produce morally righteous behaviour (Crane, 2010). A person's virtues are a collection of characteristics that contribute to their ability to live a happy life. If someone is exposed to good ethical

principles like honesty, justice, and fairness, he will uphold them and they will embed themselves in his desire to act morally in all circumstances (Audi, 2012). For example, if a board member decides to be honest, he strengthens his honesty virtue, leading to better environmental reporting.

The theory has been empirically evaluated in prior studies to define and assess virtuous leadership based on Confucian and Aristotelian virtue ethics. While Gotsis and Grimani (2015) found that a study differentiates between virtuous managerial, leadership, and employee attitudes, virtuous management and leadership development, and virtuous employee training based on the potential foci and loci of virtuous behaviour. Six characteristics, including four Aristotelian cardinal virtues (courage, temperance, justice, and prudence) and two Confucian cardinal virtues (humanity and truthfulness), were found to be shared by the leadership styles assessed in the study, according to the research (Hackett and Wang, 2012). Other than that, a study by Baldo (2019) shows that integrity is linked to the underlying motives of business owners and management in the context of corporate social responsibility (CSR). The scientific, political, and corporate communities have recently been more interested in approaches that emphasise intrinsic motivation for sustainability and CSR initiatives, although a growing body of evidence supports the need to address both internal and external factors. Integrity may be used as a management control technique based on the adoption of organisational values and virtues since organisational practises have both a formal and an informal dimension (Baldo, 2019).

In order to overcome the limitations of legal compliance programmes and improve managerial control of behaviours, the virtue ethics perspective enables the conceptualization of the normative aspects of virtuous competence that make up the good

character of the board and management applied to the decision-making process (Baldo, 2019). Due to this condition, virtue ethics can be related to board characteristics such as board size, board independence, board meeting and board gender diversity and sustainability steering committee.

Wang and Hackett (2016) has discovered that virtue ethics is a beneficial framework for driving virtuous business activity and promoting ethical company culture. It is a significant discovery because ethical corporate practices and a strong ethical culture are vital. For example, larger board size is more conducive to ethical disclosure, such as environmental reporting (Sankara et al. 2017).

Other than that, independent directors will perform more to laws and regulations and give effective leadership by honestly handling the board's priorities (Peters and Romi, 2015; Securities Commission Malaysia, 2012). Moore (2005) has shown that corporate character is significant in virtue ethics because a good character is a foundation for anything that becomes excellent, such as running a successful business.

With more frequent board meetings, there is more impact of ethical actions on environmental reporting. Virtue ethics allows board members to emphasise inspirational standards of ethics, motivating them to do good even when they are not being watched (Arjoon, 2010). According to virtue ethics theory, virtue ethics can also be easily integrated into company codes of ethics, inspiring the board of directors to have a good character that can act as a buffer against future crises (Wang and Hackett, 2016).

The female director also resulted in being more socially responsible and more concerned to stakeholders (Adams, 2015; Post et al., 2011). According to Rachels and

Rachels (2019), it is connected to virtue ethics since in virtue ethics, a person is considered morally upright if their actions exhibit a certain virtue. While good behaviour should follow from virtue, it is important to note that virtue and right action do have a connection.

Additionally, attempts to develop employees into moral corporate employees are linked to moral management initiatives and leaders' obligations to advance the greater good. This statement can be related to sustainability steering committee and board meeting. It affirms the morality of the organisation (Gotsis and Grimani, 2015).

According to a study, the job of an environmental committee in a sustainability steering committee is to develop, execute, and review sustainability policies and actions in a systematic manner. Sustainability steering committee can improve employee awareness of the environmental issues that give implications in works and the responsibilities to reduce the harmful effects (Dietz et al., 2007). According to Arjoon (2010), it is connected to virtue ethics since virtuous features are admirable qualities that are frequently seen as influencing how morally upright a person is. It is important to remember that all behaviours can be learned, including ethical behaviour. This viewpoint is founded on psychology's learning theory, which considers all behaviour results from observations and adaptations. It suggests that virtues can be successfully taught (Arjoon, 2010).

The virtue ethics theory was used in this study because it amply demonstrates how board characteristics and sustainability steering committee features may be converted into improved e-waste information disclosure utilising the virtue ethics theory. Such a viewpoint results in the strong support of the research's theoretical foundation.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter includes details of the study's methodology, research framework, and developed hypotheses. This chapter will address the research design, data collection techniques, sampling approach, research tools, unit of analysis, variable measurement, and data analysis.

3.2 Research Framework

3.2.1 Proposed Research Framework

The model of the present study is conceptualized and adapted from the previous works on environmental reporting (Aliyu, 2019; Doan & Sassen, 2020; Latif et al., 2020; Shahab et al., 2020; Shwairef et al., 2021), board characteristics (Aliyu, 2019; Janggu et al., 2014; Khaireddine et al., 2020; Latif et al., 2020; Liao et al., 2015; Shwairef et al., 2021; Yunusa et al., 2016) and sustainability steering committee (Biswas et al., 2018; Dietz et al., 2007; Eccles et al., 2014; Liao et al., 2015; Peters & Romi, 2015). The board of directors, who are in control at the top of the organisational hierarchy or top management of publicly listed companies in Malaysia, are the primary subject of this research. This research aims to examine board characteristics and sustainability steering committee impact on extent and quality of information of e-waste informed.

The framework is underpinned by virtue ethics theory. The theory combines two elements which are affective and intellectual. The former entails doing the right thing while feeling good, and the latter entails doing the right thing for the right reason (Annas, 2003). Generally, virtue ethics is a school of thought that holds that developing moral character is the best way to influence ethics and moral society (Palanski & Vogelgesang, 2011). This theory can evaluate the virtue ethics in the characteristics of the board and towards the sustainability steering committee on e-waste information disclosure. This ethics can also improve the board's decision-making perspective on e-waste information disclosure and do the right thing in an affective and intellectual way for the companies, human beings, and environment.

The study used the board characteristics of board size, board independence, board meeting, board gender, and sustainability steering committee to construct a research framework on the influence of environmental reporting based on previous literature.

This study proposes board characteristics as a variable in e-waste information disclosure. As there is the least number of research on the influence of board size on e-waste information disclosure to the author's knowledge, this study uses board size as a criterion for determining if board size has a substantial effect on e-waste information disclosure using the virtues ethic theory. According to prior research, the board is more likely to include high-ethical members who impact ethics disclosure. A large board is more receptive to ethical disclosure (Sankara et al., 2017). The larger the board, the more intelligent it is, and the more likely it will do the right thing. One of the criteria for board characteristics in this study is board independence. The board's independence may be very beneficial for disclosing information on e-waste. According to the virtues ethic theory, a

more independent board can lead to moral perfection and expose the board to great and positive ethical norms. Independent directors offer a wider variety of skills, networks, and expertise to the table (Ntim & Soobaroyen, 2013).

In addition, the board meeting shows how committed the board is to the firm. A previous study found that more frequent board meetings are associated with ethical disclosure of corporate social responsibility (Sankara et al. 2017). According to the virtue ethics theory, it might be argued that holding more board meetings will result in better strategic e-waste management and organised e-waste information disclosure. Before and after e-waste management and reporting orders are issued, it allows for additional discussion. However, a prior study found that there had been little research into how board meetings affected the sharing of e-waste information. Therefore, this characteristic will be investigated in this study.

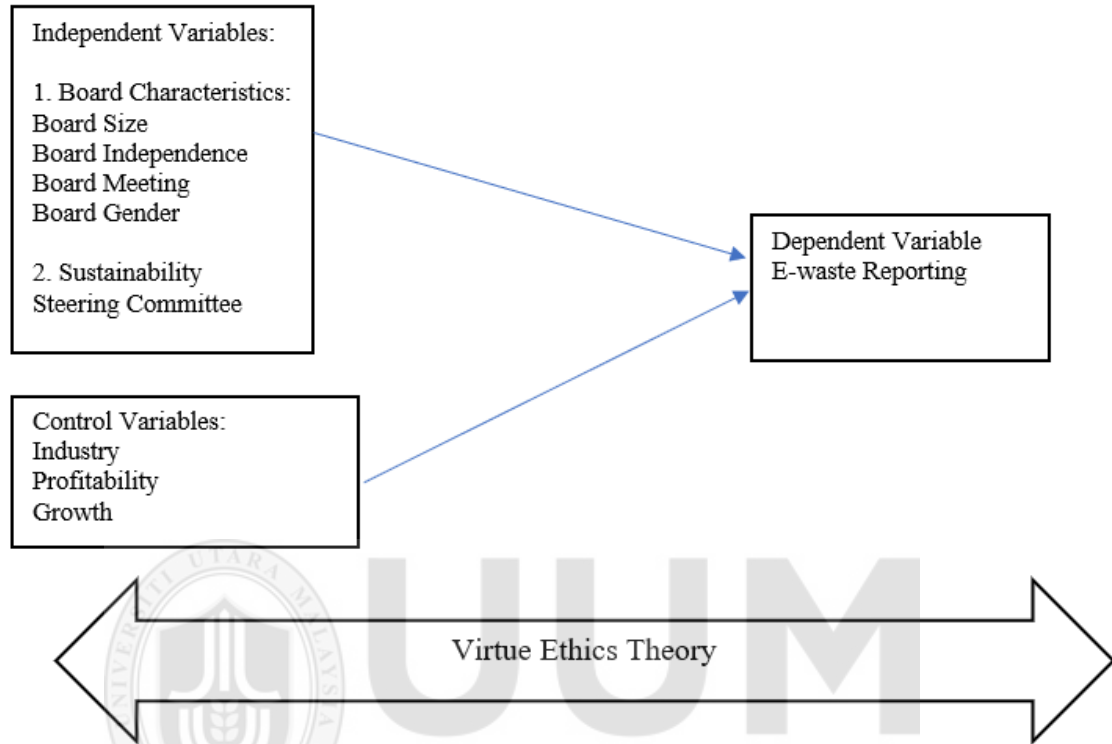
The board's gender diversity was one of the variables utilised in this study. Gender diversity on boards is now a well-known aspect of board diversity that has been used in previous studies (Mahmood et al., 2018). Gender diversity has been demonstrated to improve environmental reporting (Ben-Amar et al., 2017; Elmagrhi et al., 2016; Giannarakis et al., 2020; Ntim, 2015). Female directors will enhance environmental reporting, according to a recent study. Research shows that women are more to recognise the moral challenges and behave morally in certain situations than males (Post et al., 2011). According to study by Castilla-Polo (2018), the Unified Code of Corporate Governance promotes the appointment of women to the board of directors as a way to improve corporate social responsibility and challenge ethics, policy, and practises. Aside from that, Ben-Amar et al. (2017) discovered that having more women on the board

increases board performance in managing stakeholders and encourages sustainability reporting implementation. It is in line with the virtue ethics hypothesis, which contends that female directors would honestly and sensitively discuss environmental issues facing their organisations. However, the research is limited in e-waste information disclosure specifically and need further investigation with a different setting. It is expected that the female director would significantly impact e-waste information disclosure due to their excellent character and positive ethical norms.

Another independent variable of the study is the sustainability steering committee. The previous study primarily demonstrates that improved environmental disclosure may be achieved through the formation of sustainability steering committee in a company (Eccles et al., 2014; Garcia-Torea et al., 2016; Lau et al., 2016; Liao et al., 2015; Peters & Romi, 2014; Shahin & Zairi, 2007). It shows that the company's sustainability steering group will make the best decision possible. The virtue ethics school of thought holds that the capacity to consider a variety of facts is closely related to intellectual qualities. They stand out for being both intelligent and practical at the same time (Alejo Jose et al., 2015). However, in e-waste information disclosure research, the study involving the sustainability steering committee is somewhat limited and need further investigation with a different context. The virtue ethics theory predicts that the disclosure of e-waste information will take place in the formation of a sustainability steering committee due to committee's strong ethical standards.

Figure 3. 1

Proposed Research Framework



3.3 Hypotheses Development

Following the establishment and explanation of the study framework and theoretical knowledge, this section offers and examines the research hypotheses. The theoretical framework shown in Figure 3.1 is used to generate the hypotheses. The board characteristics, the sustainability steering committee, and the disclosure of e-waste information are the three factors that were taken into consideration in this study, as was explain in Chapter Two. The next subsections give a description of each component's hypothesis.

3.3.1 Different Industries and E-waste Information Disclosure

According to a study from Bursa Malaysia Securities Berhad (2018a), the only businesses required to disclose their yearly e-waste information disclosure in the sustainability reporting are the telecommunications and technology sectors and it is compulsory for telecommunication and technology industries as one of the requirements in public listing requirements (Bursa Malaysia Securities Berhad, 2018a). It is because these both industries are closely tied to the use of technological devices (Abd-Mutalib et al., 2021). It shows that telecommunication and technology industries should have better e-waste information disclosure from other industries.

H₁: Telecommunication and technology industries have a significant difference in e-waste information disclosure from other industries.

3.3.2 Board Characteristic and E-waste Information Disclosure

3.3.2.1 Board Size and E-waste Information Disclosure

Previous studies show a connection between environmental reporting and board size that is positive (Janggu et al., 2014; Shwairef et al., 2021). Other research found larger boards may negatively influence environmental reporting (Aliyu, 2019; Azlan & Roszaini, 2011; Ienciu et al., 2012; Latif et al., 2020; Wan Abdullah et al., 2012). These studies have shown that the influence of board size on environmental reporting is not conclusive. Thus, it is argued that board size would influence environmental reporting. However, e-waste information disclosure will be used to substitute environmental reporting as the dependent variable in this study.

Meanwhile, from perspective of virtue ethics theory, a larger board can contribute to ethical behaviour. It consists of more ethical members conducive to ethics disclosure because virtue ethics drives virtuous conduct and can lead to ethical corporate culture. The board will be more focused on the importance of moral attitude and integrity (Sankara et al., 2017; Wang & Hackett, 2016).

H₂: A larger board size in companies are more likely to impact e-waste information disclosure positively.

3.3.2.2 Board Independence and E-waste Information Disclosure

The previous studies have concluded, mixed findings on the influence of board independence on environmental reporting have shown. Several studies found that board independence contributes to environmental reporting (Aliyu, 2019; Donnelly & Mulcahy, 2008; R. M. Haniffa et al, 2005; Htay et al., 2012; Ienciu et al., 2012). The more independent a board member is, the more likely environmental disclosure is (Htay et al., 2012; Sallehuddin & Fadzil, 2013). Some researchers also found that board independence is insignificant to environmental reporting (Barako et al., 2006; Buniamin et al., 2008; Razak & Mustapa 2013; Shwairef et al., 2021; Wan Abdullah et al., 2012). Since there are inconclusive findings from the past studies and drawing upon the study hypothesized it.

By virtue ethics theory, board independence can be related to this theory because an independent director can give effective leadership better than a non-independent director. An independent director can provide effective leadership by objectively marshalling the board's priorities (Securities Commission Malaysia, 2012). An independent director must be unaffected by any factors, including environmental

concerns, that might skew their professional judgements, honesty, or objectivity with regard to the company's financial objectives (Wan Abdullah et al., 2012). It shows independent boards will act more ethically.

H₃: More independent boards in companies are more likely to impact e-waste information disclosure positively.

3.3.2.3 Board Meeting and E-waste Information Disclosure

The virtue ethics theory shows that having more frequent board meetings impacts ethical corporate social responsibility disclosure (Sankara et al., 2017). It also boosted board supervision and scrutiny, reduced agency costs and information asymmetry, and almost always improved disclosure quality (Chou et al., 2013). From virtue ethics theory perspective, virtue ethics can also be easily integrated into business codes of ethics, inspiring the board of directors to have a good character that can act as a buffer against a future crisis (Wang & Hackett, 2016). Virtue ethics provides an opportunity to emphasise inspirational codes of ethics, encouraging board members to do good even when they are not being observed. A paradigm that emphasises human character and integrity can be used to resolve a corporate problem effectively (Arjoon, 2010).

There is a significant positive relationship between board meetings with environmental disclosure (Conger et al., 1998; Ntim & Osei, 2011; Odoemelam & Okafor, 2018). The extent of environmental disclosure will be positively impacted by the frequency of board activities and the existence of a committee charged with environmental responsibility (Odoemelam & Okafor, 2018). It is because, the board will discuss environmental matters in board meeting (Giannarakis et al., 2020). On the other

hand, some research contradicts the positive association between board meetings and environmental reporting (Kantudu & Samaila, 2015; Siman et al., 2019). Drawing upon the virtue ethics theory and prior studies' findings, the following hypothesis has been proposed.

H₄: More board meetings are more likely to impact e-waste information disclosure positively.

3.3.2.4 Board Gender and E-waste Information Disclosure

In the perspective of virtue ethics theory, board gender can be relatable in this theory context because research found that women directors are more responsible and improve companies' disclosure, especially in environmental disclosure (Al-Sher & Zaman, 2016; Aribi et al., 2018; Post et al., 2011; Sartawi et al., 2014). According to Rachels and Rachels (2019), virtues are a character attribute displayed in activity beneficial to anyone. A person is deemed morally right in virtue ethics if their acts demonstrate a particular virtue (Rachels & Rachels, 2019). While a virtuous character is expected to lead to good behaviour, it is worth mentioning that virtuous character and proper action do have a relationship (Rachels & Rachels, 2019).

Previous research has shown a variety of results. According to previous studies, the level of environmental reporting is improved by the existence of woman on the board of directors (Al-Shaer & Zaman, 2016; Aribi et al., 2018; Nadeem et al., 2017; Sartawi et al., 2014). It is because woman director is more responsible (Post, 2015). According to a prior study, having more women on boards of directors improves financial performance and encourages firms to make more positive changes to other sustainability variables,

such environmental performance (Baalouch et al., 2019). In opposite, some studies stated that board gender is insignificant with environmental reporting (Prado -Lorenzo & Garcia-Sanchez, 2010; Stefanescu, 2013).

Due to this mixed finding, further research will be carried out in a different setting. Women directors are closely linked to virtue ethics attitudes (Al-Shaer & Zaman, 2016; Aribi et al., 2018; Nadeem et al., 2017; Post et al., 2011; Sartawi et al., 2014). A hypothesis has been developed.

H₅: Companies with more woman directors are more likely to impact e-waste information disclosure positively.

3.3.3 Sustainability Steering Committee and E-waste Information Disclosure

Virtue ethics theory suggests there is a connection between the theory and sustainability steering committee. A study shows that the sustainability steering committee could help create environmental awareness to the employees about the implication of the work and the responsibility to reduce harmful effects (Dietz et al., 2007). In virtue ethics theory, virtuous attributes are those that are frequently viewed as determining how morally righteous a person is (Arjoon, 2010). It is worth noting that all behaviours, including ethical behaviour, can be taught through observations and adaptations (Arjoon, 2010). Virtue ethics theory is relatable to sustainability steering committee because sustainability steering committee can show the employees of the company the positive traits.

Several prior studies document a significant positive relationship between the sustainability steering committee with environmental disclosure (Dietz et al., 2007;

Garcia-Torea et al., 2016; Lau et al., 2016; Liao et al., 2015; Peters & Romi, 2011). On the other hand, A research study contradict the positive relationship between board meetings and environmental reporting (Rodrigue et al., 2013). Based on the argument provided that draws upon the virtue ethics theory and finding from previous studies, the following hypothesis is proposed.

H₆: Sustainability steering committees are more likely to impact e-waste information disclosure positively.

3.4 Research Design

The main goal is to establish the sustainability steering committee and board characteristics as the independent variables that might affect the e-waste information disclosure. All research variables were assessed simultaneously for this study. Data are collected from annual reports, corporate governance reports, and sustainability reports, were utilised in this study.

3.5 Operational Definition

3.5.1 E-waste Information Disclosure

All e-waste information disclosure includes disposing of, recycling, reusing, reducing, substituting, treating, or phasing out the e-waste (Nik Azman & Mohd Salleh, 2020).

3.5.2 Board Characteristics

3.5.2.1 Board Size

The size of the board represents the size of the boards, which might be large or little. The size of a company's board is determined by the number of internal and outside directors that serve on it in a particular year (Khairredine et al., 2020).

3.5.2.2 Board Independence

Independent directors have no personal or business ties to the corporation on directors (Ogbechie et al., 2009).

3.5.2.3 Board Meeting

The term "board meeting" refers to gatherings convened by the board of commissioners to perform the management control role (Khairredine et al., 2020).

3.5.2.4 Board Gender Diversity

Board gender is defined by the presence of male and female directors on corporate boards (Latif et al., 2020).

3.5.3 Sustainability steering committee

The body in charge of the business's sustainability strategy and performance is called the sustainability steering committee. (Yeo, 2018).

3.6 Population, Sampling and Data Collection Method

The population of study is the public listed companies in Bursa Malaysia. Public listed companies were chosen because every public listed company needs to disclose a

sustainability statement and environmental policies as a big company (Bursa Malaysia Securities Berhad, 2020). A large corporation may have sufficient resources for commercial activities and may employ modern digital technology in their daily operations, such as more digital appliances and computers. There were 960 companies under the listed industrial products sector (Bursa Malaysia Securities Berhad, 2021). This study uses one of the popular methods to determine the sampling size proposed by Krejcie & Morgan (1970). This approach produces a table based on a sample size formula for a finite population to make selecting a sample size for a small population easier. The list of companies in every sector shows in Table 3.1. However, only companies established and reported annual reports, annual reports, corporate governance reports, and sustainability reports from 2019 until 2021 will be chosen as samples. The years has been chosen from 2019 to 2021 because technology and telecommunication industries have been required to report e-waste disclosure since 2018 and sustainability steering committee has been required by MCGG in 2021 (Bursa Malaysia Securities Berhad, 2018a; Securities Commission Malaysia, 2021).

Even though e-waste information disclosure is only compulsory for the technology and telecommunications industry (Bursa Malaysia Securities Berhad, 2018b), this study has decided to include all public listed companies from the primary market as the sample of the population. As a justification, a study in India found that the emergence of the IT sector has been included in the banking sector and education sector (Borthakur & Govind, 2017). It shows that e-waste is generated in telecommunication and technology industries and other industries. It has raised concern on e-waste production for every public listed company indirectly.

Table 3.1 shows that if the total population of publicly listed companies is 960, the sample would be approximately 274 yearly (Krejcie & Morgan, 1970). The research has applied for three years, total sample should be 822 sample. The sampling will proceed with stratified sampling according to the industry. The formula will be used as below :

Sample for every industry = (no of companies in industry / total no of companies in the industry) X 274 companies

Table 3. 1

Population and Sample

Sectors	Population	Sample	Percentage (%)
Construction	71	20	7.3
Consumer Products & Services	205	58	21.2
Energy	41	12	4.4
Financial Services	35	10	3.7
Health Care	14	4	1.5
Plantation	46	13	4.8
Industrial Products & Services	275	78	28.5
Property	130	37	13.5
Technology	54	15	5.5
Real Estate Investment Trust	17	5	1.8
Telecommunication & Media	20	7	2.6
Transportation & Logistic	37	10	3.7
Utilities	14	4	1.5
Total Companies	960	274	100

The method used is based on the goals and research questions of the researchers' problems attempting to solve or answer. Furthermore, the research objectives, availability, and costs of performing the research are critical considerations in determining the research design (Quinlan et al., 2019). The research will use secondary data collected from the selected companies' relevance reports to achieve the research objective. The relevant

reports are annual reports, corporate governance reports and sustainability reports if any. Secondary data is the best data collection medium for obtaining information regarding the board characteristic in an organisation. Every company must disclose the board's details (Securities Commission Malaysia, 2021). It is also thought to be the most appropriate for this study because gathering data has been made more difficult by the current pandemic state. The data was gathered from reports that were pertinent for the period 2019–2021. Every report that is accessible will be examined in the context of the research.

3.7 Measurement of Variable

3.7.1 Dependent Variable

The data of e-waste was extracted from the Environmental Social and Governance Report by Bursa Malaysia. The extent and quality of e-waste disclosure was evaluated. Two measurements measure the extent of e-waste information disclosure: (1) the number of words count about e-waste in the report and (2) the number of sentences to measure the quality of the e-waste information disclosure. For quality measurement, will use 4-point quality scale measures was used. This method has been adapted from Abd-Mutalib et al., 2021; Bakar et al., (2019) in measuring sustainability reporting. The existence of the words such as 'e-waste', 'electronic waste', 'electrical waste' or 'e waste' have been search indicator throughout the report as the content analysis technique in order to extract the data. By finding these keyword in the report, from there the word count, number of sentence extent and the quality of information disclosed measured based on 4 point quality scale.

Table 3. 2*Measurement of Dependent Variable*

Variable	Measurement
E-waste Reporting	the number of words counts about e-waste the number of sentences to measure the quality of the e-waste reporting 0 = non-disclosure 1 = a general qualitative disclosure 2 = specific qualitative disclosure 3 = quantitative disclosure 4 = quantitative and qualitative disclosure

3.7.2 Independent Variable

The method of measuring the independent variables in this study is the same as used in past investigations (Ienciu et al., 2012; Janggu et al., 2014; Razak & Mustapha, 2013). These variables were measured to test the hypotheses that had been developed previously. Each company's annual reports for 2019-2021 were used to compile the data for these variables.

The total number of board members was used to calculate board size (Aliyu, 2019; Shwairef et al., 2021). Then, the percentage of independent non-executive directors divided by the total number of directors was used to determine board independence (Aliyu, 2019; Latif et al., 2020; Shwairef et al., 2021). Board meetings can be measured by the total number of meetings held by the company's board (Aliyu, 2019; Ntim, 2015; Odoemelam & Okafor, 2018). For the board gender diversity variable, the total number

of women directors will be divided by a total number of directors, to measure the influence of gender (woman) on e-waste (Biswas et al., 2018; Latif et al., 2020; Odoemelum & Okafor, 2018). The existence and the number of members in the environmental committee can measure sustainability steering committee inboard (Biswas et al., 2018; Eccles et al., 2014; Peters & Romi, 2011; Shwairef et al., 2021).

Table 3. 3

Measurement of Independent Variables

Variable	Measurement
Board Size	The total number of the board members in the company (<i>n</i>)
Board Independence	The number of independent non-executive directors divided by the total number of directors on board (%)
Board Meeting	The total number of meetings held by the board (<i>n</i>)
Board Gender Diversity	The number of female directors divided by the total number of directors on board (%)
Sustainability Steering Committee	The existence of a sustainability steering committee One if exist 0 if non-exist

3.7.3 Control Variable

The first control variable is growth. Growth can mitigate the issue of bias outcome as a control variable (Frias-Acetuno et al., 2013). The market-to-book assets ratio (MTBV) is a metric that compares a company's market value to its book value. Despite the availability of different growth potential metrics such as price-earnings ratios and market-to-book ratios, Adam & Goyal, (2008) discovered that the market-to-book assets ratio provides the most informational content in terms of investment opportunities. Frias-

Aceituno et al., (2013) investigate the impact of various board characteristics on the amount of information given by prominent non-financial multinational corporations. To counteract the bias problem in their results, Frias-Acituno et al. (2013) discovered that one of their control variables was growth opportunities. Companies with a higher market to book value are anticipated to provide more information to stakeholders in order to reduce information asymmetry (Mustafa et al., 2011). As a proxy for firm growth, market to book value was employed. In the Malaysian context, they discover a substantial link between company growth (as measured by MTBV) and the level of minority shareholder rights expropriation.

Other than that, profitability is also one of the control variables. One of the most popular metrics used to evaluate a company's performance is profitability. Return on Equity (ROE) was used to determine profitability, computed by dividing net income with total equity (Aliyu, 2019; Shwairef, 2021). This metric is commonly used in social and environmental reporting investigations (Aliyu, 2019; Biswas et al., 2018; Shwairef et al., 2021; Suttipun & Stanton, 2012b).

Lastly, industry is one of the control variables. It can be measured by the difference industries of every companies. As stated before, in Malaysia, technology and telecommunication industries have been compulsory industries that need to disclose the e-waste reporting annually (Securities Commission Malaysia, 2021). It can be one variable in measuring this study. Previous study from Abd-Mutalib et al., (2014) has use industries difference as one of the measurement in measuring the existence, quality and extent of sustainability reporting study.

Table 3. 4

Measurement of Control Variable

Variable	Measurement
Growth	Net Operating Profit After Tax / Invested Capital
Profitability	Return on Equity (ROE) = Net income / total equity
Industry	The difference of industries selected 1 for technology and telecommunication industry 0 for other industries

3.8 Data Analysis

The information was gathered between 2019 and 2021 via yearly reports as annual reports, corporate governance reports, and sustainability reports. SPSS software was used to analyse the data and assess the hypotheses using a range of statistical methodologies and techniques. The methods for determining the responses to all of the research questions—descriptive analysis, multiple linear regression, and T-test—are described.

3.8.1 Data Cleaning

The first stage in data analysis is cleaning the data, which identifies any missing values or data. A researcher must be aware of any missing data since it could be misleading when choosing the best approach for gathering and evaluating the data, according to Hair et al. (2018). After the data has been cleansed in syntax (a statistical programming language), the SPSS analytic technique may start with the coding phase.

3.8.2 Descriptive Statistics Analysis

The study's data is described and summarized using descriptive statistics analysis. All measurements, such as mean, standard deviation, maximum and minimum count, are generally described in the study (Hair et al., 2018; Latif et al., 2020). Thus, the first analysis describes the basic features of all the data gathered, which are board size, board independence, board meeting, board gender, and sustainability steering committee.

3.8.3 T-test

By comparing the means of two separate groups, the Independent Samples T-test determines whether there is statistical support for the hypothesis that the related population's means differ considerably. The T-test for Independent Samples is a parametric test. T-test has been used in a study by Abd-Mutalib et al., (2021). T-test will be analysed which industries have a better e-waste information disclosure among 14 industries.

3.8.4 Multiple Linear Regression

The impact of board size, board independence, board meetings, board gender, and the sustainability steering committee on the extent and quality of e-waste information disclosure disclosures is investigated using multiple regression analysis. The following is the regression model:

$$EID = a + \beta_1 BSize + \beta_2 BInd + \beta_3 BMeeting + \beta_4 BFemale + \beta_5 SSCommittee + \beta_6 Profit + \beta_7 Growth + \beta_8 Industries + \varepsilon$$

Where:

EID = E-waste information disclosure score measured by number of words, number of sentences and the disclosure index score

BSize = Total number of directors on board

BInd = number of independent non-executive directors scaled by the total

BMeeting = Total number of meetings held by board

BFemale = Percentage of female directors on board

SSCommittee= Sustainability Steering Committee

Profit = The return on equity of the company

Growth = The market to book asset ratio

Industries = The difference of Industries

α = Constant

ε = The error term

3.9 Summary

The methodology, research strategy, and development hypotheses for this study are all presented in this chapter. In this study, 274 sampled firms from the population of publicly listed companies in Bursa Malaysia were chosen between 2019 and 2021 using a stratified selection approach. In this research, the impacts of five independent factors on one dependent variable—the disclosure of e-waste information were examined. The dependent variables are the extent of e-waste information disclosures and the quality of e-waste information disclosure. The sustainability steering committee and board characteristics are all independent variables. Analytical analysis, descriptive statistics analysis, and multilinear regression were all applied in the data analysis.

CHAPTER 4

RESULT

4.1 Introduction

The results are presented in this chapter in four sections. Descriptive statistics are used to analyse the dependent, independent, and control variables at the beginning of this chapter. The preliminary analysis that was conducted to clean up the data and check for problems with heteroskedasticity and multicollinearity is then presented in the paper. The chapter then proceeds with test of difference, show the results of the regression analysis used to test the initial hypotheses, and wrap up.

4.2 Preliminary Analysis

4.2.1 Data cleaning and screening

The study discovered 38 missing values during the data gathering process, as shown in the table below. Microsoft Excel is used to extract and record the data from the yearly reports, sustainability report, and Datastream. These data are then combined into one Microsoft Excel working sheet in the appropriate format for transfer or import into SPSS.

Table 4. 1*Missing Value*

Type of Data	Remarks
E-waste Information disclosure	
1. No of words	No Missing Value
2. No of Sentences	
3. Quality	
Board Characteristics	
1.Board Size	No Missing Value
2.Board Independence	
3.Board Meeting	
4.Board Gender Diversity	
Sustainability Steering Committee	No Missing Value
1. Existence of Sustainability Steering Committee	
Industries	15 of the sampled firms indicate missing values for ROIC, measured by return on invested capital, and 8 firms indicate missing values for ROE measured by return on equity.
Return on Equity	
Return on Invested Capital	

Due to the fact that 15 firms' ROIC values and 8 firms' ROE values were absent, this study found 23 firms to have missing data. As a result, 799 companies remain after the removal of all observations with missing values. The test for identifying outliers has not yet been performed, so this sample size is not final.

4.2.2 Normality tests and outlier detection

Normality tests are typically used to determine whether data collected is distributed normally within a specific population (Singh, & Masuku, 2014). Kurtosis measurements can determine whether a curve is normal or abnormally formed. In contrast, Kurtosis provides information on the distribution's peakedness, which can be either excessively peaked or too flat (Tabachnick & Fidell, 2007). A curve may be positively or negatively skewed. The majority of the scores on negatively skewed curves are above the mean, the exact opposite of positively skewed curves. The result of both curves is a normal asymmetrical curve. Skew and kurtosis can be evaluated using descriptive statistics. Kurtosis is allowed between -10 and +10, while skewness is allowed between -3 and +3 (Kline, 2015).



Table 4. 2*Descriptive Statistics*

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
EID_NOW	799	5.88	0.086	42.042	0.173
EID_NOS	799	5.681	0.086	40.175	0.173
EID_Q	799	3.848	0.086	14.128	0.173
BS	799	0.607	0.086	0.046	0.173
Bind	799	0.925	0.086	1.574	0.173
BM	799	2.815	0.086	10.537	0.173
BD	799	1.046	0.086	2.575	0.173
SSC	799	1.425	0.086	0.03	0.173
ROE	799	1.856	0.086	21.454	0.173
ROIC	799	1.836	0.086	15.33	0.173
ID	799	3.164	0.086	8.029	0.173
Valid N (listwise)	799				

Variables Definition:

EID_NOW = No of Word of E-waste Information Disclosure; EID_NOS =No of Sentence of E-waste Information Disclosure; EID_Q = Quality of E-waste Information Disclosure 0 = non-disclosure 1 - a general qualitative disclosure 2 -specific qualitative disclosure 3 - quantitative disclosure 4-quantitative and qualitative disclosure; BS =The total number of the board members in the company (n) ; BInd = The number of independent non-executive directors divided by the total number of directors on board (%); BM =The total number of meetings held by the board (n); BD=The number of female directors divided by the total number of directors on board (%); SSC= The existence of a sustainability steering committee1- exist0- non-exist; ROE = Return On Equity- Return on Equity = Net income / total equity; ROIC = Return On Invested Capital; Net Operating Profit After Tax / Invested Capital ; ID = Industries Difference= The difference of industries selected,1 for technology and telecommunication industry, 0 for other industries N = 799.

The variables EID_NOW, EID_NOS, EID_Q, BM, ROE, and ROIC indicate a non-normality condition where the skewness or kurtosis is more than 3.00 and 10.00 in the table above. According to Hair (2011), researchers may think about using data

transformation to fix the issue of non-normality to obtain normal data. A variety of transformation methods, including the square root, log, and ranking value, can be used to enhance the normalcy of a distribution (Conover, 2012; Hair, 2011). The natural log (ln) transformation and fractional ranking for transformation are applied in this paper. The results demonstrate that, despite most variables having improved measurements of skewness and kurtosis, the variables EID_NOW still hint at a non-normal condition where the scores for skewness and kurtosis are greater than 3.00 and 10.00, respectively. To find the outliers that can affect the normality of the data, additional analysis is conducted. Boxplot, a test for identifying multivariate outliers, is used in this study. The study finds 14 data that suggest multivariate outliers from the boxplot tests on all tested models. As a result, the sample is reduced to 785 businesses after eliminating all 11 outliers. When the variables' skewness and kurtosis are again assessed after elimination, all the variables show normal distribution. The last names of the variables following transformation shows in the table 4.3

Table 4. 3*Skewness and Kurtosis*

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
EID_NOW	785	3.007	0.087	7.512	0.174
EID_NOS	785	2.979	0.087	7.562	0.174
EID_Q	785	2.922	0.087	6.933	0.174
BS	785	0.612	0.087	0.058	0.174
Bind	785	0.927	0.087	1.567	0.174
BM	785	1.192	0.087	2.372	0.174
BD	785	0.779	0.087	1.119	0.174
SSC	785	1.444	0.087	0.086	0.174
ROE	785	3.195	0.087	8.226	0.174
ROIC	785	0.007	0.087	-0.099	0.174
ID	785	0.001	0.087	-0.118	0.174
Valid N (listwise)	785				

Variables Definition:

EID_NOW = No of Word of E-waste Information Disclosure; EID_NOS =No of Sentence of E-waste Information Disclosure; EID_Q = Quality of E-waste Information Disclosure 0 = non-disclosure 1 - a general qualitative disclosure 2 -specific qualitative disclosure 3 - quantitative disclosure 4-quantitative and qualitative disclosure; BS =The total number of the board members in the company (n) ; Bind = The number of independent non-executive directors divided by the total number of directors on board (%); BM =The total number of meetings held by the board (n); BD=The number of female directors divided by the total number of directors on board (%); SSC= The existence of a sustainability steering committee1- exist0- non-exist; ROE = Return On Equity- Return on Equity = Net income / total equity; ROIC = Return On Invested Capital; Net Operating Profit After Tax / Invested Capital ; ID = Industries Difference= The difference of industries selected,1 for technology and telecommunication industry, 0 for other industries N = 799.

4.2.3 Results of multicollinearity

Multicollinearity, according to Pallant (2007), exists when the independent variables have a strong correlation ($r = 0.90$ or above). To check for multicollinearity in the regression model, collinearity diagnostics based on variance inflation factor (VIF) tolerance statistics were used. This research uses correlation analysis and VIF to examine the multicollinearity issue, and they utilized the VIF and tolerance value as the initial test

for multicollinearity detection. According to Chatterjee et al. (2000), a multicollinearity issue is indicated by any VIF value greater than 10 with a tolerance value of less than 0.10. Referring to the table below, the outcome indicates that the VIF score for each variable is less than 10. This result shows that the model has no multicollinearity issues.

Table 4. 4

<i>Coefficients</i>	Collinearity Statistics	
	Tolerance	VIF
BS	0.556	1.799
BInd	0.489	2.044
BM	0.812	1.232
BD	0.901	1.11
SSC	0.983	1.017
ID	0.96	1.041
ROE	0.917	1.09
ROIC	0.988	1.012

a. Dependent Variable: No of Sentences E-waste Information Disclosure

Variables Definition:

EID_NOW = No of Word of E-waste Information Disclosure; EID_NOS =No of Sentence of E-waste Information Disclosure; EID_Q = Quality of E-waste Information Disclosure 0 = non-disclosure 1 - a general qualitative disclosure 2 -specific qualitative disclosure 3 - quantitative disclosure 4-quantitative and qualitative disclosure; BS =The total number of the board members in the company (n) ; BInd = The number of independent non-executive directors divided by the total number of directors on board (%); BM =The total number of meetings held by the board (n); BD=The number of female directors divided by the total number of directors on board (%); SSC= The existence of a sustainability steering committee1- exist0- non-exist; ROE = Return On Equity- Return on Equity = Net income / total equity; ROIC = Return On Invested Capital; Net Operating Profit After Tax / Invested Capital ; ID = Industries Difference= The difference of industries selected,1 for technology and telecommunication industry, 0 for other industries N = 799.

4.3 Descriptive Statistics Analysis

Table 4. 5

Descriptive Statistics

	N	Minimum	Maximum	Mean
EID_NOW	785	0	220	7.39
EID_NOS	785	0	9	0.31
EID_Q	785	0	4	0.22
Valid N (listwise)	785			

The sample companies were chosen at random using computer-generated numbers from 785 listed companies in Bursa Malaysia across 14 categories. Table 4.5 displays all variables' descriptive statistics. In the table above, the minimum score for the number of sentences, words, and quantity index of e-waste information disclosure is 0. This finding indicates that several companies fail to mention e-waste in annual or sustainability reports. A total of 220 words, 9 words, and a quality score of 4 can be earned for the disclosure, which is in both quantitative and qualitative disclosure. While the mean score of 7.39 words, 0.31 sentences, and 0.21 indicates low and weak disclosure, the quality disclosure index indicates that the e-waste disclosure quality is centred between nothing and general qualitative disclosure.

Other than that, for descriptive analysis, this study also compare the difference of e-waste information disclosure by industries according to number of words of e-waste information disclosure, number of sentences of e-waste information disclosure and the quality of e-waste information disclosure.

Table 4. 6

Descriptive Statistics
 Number of Words of E-waste Information Disclosure

Industries	N	Mean	Std. Deviation	Minimum	Maximum
Construction	58	6.90	31.599	0	186
Consumer Products & Services	164	5.38	24.033	0	199
Energy	34	7.68	27.963	0	131
Financial Services	30	16.87	38.061	0	162
Health Care	11	0.00	0.000	0	0
Industrial Products & Services	227	1.63	15.965	0	220
Plantation	38	4.47	19.235	0	85
Property	107	7.05	30.789	0	196
Real Estate Investment Trust	15	0.00	0.000	0	0
Technology	40	26.50	52.646	0	200
Telecommunication & Media	19	54.68	69.742	0	209
Transportation & Logistic	30	5.50	14.441	0	55
Utilities	12	16.42	34.786	0	104
Total	785	7.39	29.375	0	220

As can be seen from Table 4.6, the number of words of e-waste information disclosure, the highest number of e-waste information disclosure reported are from telecommunication and media industries (mean = 54.68) and followed by technology industries (mean = 26.50), utilities industries (mean = 16.42) and financial services industries (mean = 16.87). The study also reported the lowest number of e-waste information disclosure has been produced by health care and real estate investment trust industries.

Table 4. 7*Descriptives Statistics***Number of Sentences of E-waste Information Disclosure**

Industries	N	Mean	Std. Deviation	Minimum	Maximum
Construction	58	0.24	1.113	0.146	7
Consumer Products & Services	164	0.24	1.008	0.079	8
Energy	34	0.35	1.178	0.202	6
Financial Services	30	0.60	1.303	0.238	4
Health Care	11	0.00	0.000	0.000	0
Industrial Products & Services	227	0.08	0.604	0.040	7
Plantation	38	0.16	0.679	0.110	3
Property	107	0.21	0.858	0.083	5
Real Estate Investment Trust	15	0.00	0.000	0.000	0
Technology	40	1.25	2.262	0.358	8
Telecommunication & Media	19	2.47	3.186	0.731	9
Transportation & Logistic	30	0.33	0.758	0.138	3
Utilities	12	0.50	1.000	0.289	3
Total	785	0.31	1.165	0.042	9

Next, Table 4.7 shows that the number of sentences of e-waste information disclosure, the highest number of sentences of e-waste information disclosure reported are from telecommunication and media industries (mean = 2.47) and followed by technology industries (mean = 1.25). There is only difference between utilities industries (mean = 0. 50) and financial services industries (mean = 0.60). The study also reported the lowest sentence number of e-waste information disclosure has been occurred among health care and real estate investment trust industries.

Table 4. 8*Descriptive Statistic*

Quality of E-waste Information Disclosure

Industries	N	Mean	Std. Deviation	Minimum	Maximum
Construction	58	0.21	0.894	0.117	0
Consumer Products & Services	164	0.15	0.648	0.051	0
Energy	34	0.21	0.641	0.110	0
Financial Services	30	0.50	1.075	0.196	0
Health Care	11	0.00	0.000	0.000	0
Industrial Products & Services	227	0.05	0.373	0.025	0
Plantation	38	0.16	0.679	0.110	0
Property	107	0.20	0.782	0.076	0
Real Estate Investment Trust	15	0.00	0.000	0.000	0
Technology	40	0.90	1.446	0.229	0
Telecommunication & Media	19	1.21	1.584	0.363	0
Transportation & Logistic	30	0.33	0.758	0.138	0
Utilities	12	0.75	1.422	0.411	0
Total	785	0.22	0.792	0.028	0

Lastly, as presented in Table 4.8 for the quality of e-waste information disclosure, the disclosure index of e-waste information disclosure are from telecommunication and media industries (mean = 1.21) and followed by technology industries (mean = 0.90). The research also revealed that the health care and real estate investment trust sectors had the lowest quality e-waste information disclosure.

The following findings indicate that more information regarding e-waste has been released by the telecommunications and media, and technology industries than by any other industry in annually. It might happen due to the obligation from both industries to report the e-waste management activities annually.

4.4 Test of Difference

Table 4. 9

Test of Difference

Sector Difference		N	Mean	Std. Deviation	Std. Error Mean
EID_NOW	Telecommunication and Technology	60	34.98	59.250	7.649
	Other Industries	725	5.11	24.084	0.894
EID_NOS	Telecommunication and Technology	60	1.62	2.617	0.338
	Other Industries	725	0.20	0.870	0.032
EID_Q	Telecommunication and Technology	60	0.98	1.479	0.191
	Other Industries	725	0.16	0.670	0.025

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
EID_NOW	Equal variances assumed	118.440	<0.001	7.858	783.000	<0.001	29.872
	Equal variances not assumed			3.879	60.624	<0.001	29.872
EID_NOS	Equal variances assumed	196.935	<0.001	9.551	783.000	<0.001	1.415
	Equal variances not assumed			4.169	60.085	<0.001	1.415
EID_Q	Equal variances assumed	110.175	<0.001	8.045	783.000	<0.001	0.823
	Equal variances not assumed			4.277	61.024	<0.001	0.823

The second goal is to determine if the sampled companies' disclosure of information on e-waste varies depending on the industry. The table 4.9 demonstrates a significant difference between the telecommunications and technology industries and other industries in the mean scores of the amount of words, sentences, and e-waste reporting quality. Based on the number of words reported about e-waste information disclosure, telecommunication and technology industries ($M = 34.98$, $SD = 59.250$) shows more significant ($t = 7.858$, $p = <0.001$) than other industries ($M = 5.11$, $SD = 24.084$). Same result is showed for number of sentences reported about e-waste information disclosure ($M = 1.62$, $SD = 2.617$) and the quality of e-waste information disclosure ($M = 0.98$, $SD = 1.479$). Telecommunication and technology industries are more significant in number of sentences ($t = 9.551$, $p = <0.001$) and quality of e-waste information disclosure ($t = 8.045$, $p = <0.001$) than other industries.

4.5 Regression Analysis

The ultimate objective is to ascertain if the sustainability steering committee and board features significantly affect the disclosure of e-waste information. Board characteristics are represented by board size, board independence, board meetings, and board diversity.

The results in Table 4.10 show that the regression analysis and models 1, 2, and 3 match the research model. This is because the model fits the data and establishes a linear relationship between the dependent variable and independent variables, as indicated by the adjusted R-squared of 0.1203 and the F ratio being significant ($p < 0.01$). The similar

circumstance is seen in models 2 and 3, where the adjusted R-squared for the regression is 0.1312 and 0.1145, respectively, and the F ratio is significant ($p < 0.01$).

Results in the Table 4.10 indicate that only board meeting and the existence of steering committee suggests a significant positive impact on all measures of e-waste information disclosure. The board meeting shows that the significant value of 0.002 in model 1, 0.003 in model 2 and model 3 which are consistent with the virtue ethics theory that posits more number of board meetings held, there is positive impact of ethical actions on environmental reporting. Virtue ethics allows board members to emphasise inspirational standards of ethics, motivating them to do good even when they are not being watched (Arjoon, 2010) which is had been justified with previous findings from Conger et al., (1998), Ntim & Osei, (2011) and Odoemelam & Okafor (2018).

For sustainability steering committee, it has shown with significant value of 0.030 in model 1 and model 2. 0.034 in model 3. These results are align with virtue ethics theory when s sustainability steering committee can improve employee awareness of the environmental issues that give implications in works and the responsibilities to reduce the harmful effects (Dietz et al., 2007). It is related to virtue ethics because virtuous traits are positive attributes that are usually perceived as shaping the amount to which a person is morally right, according to Arjoon (2010). This result also has been justified by previous studies from Dietz et al. (2007), Garcia-Torea et al. (2016), Lau et al. (2016), Liao et al., (2015) and Peters & Romi (2011). Other tested variables (board size, board independence, board diversity) were not statistically significant. The results thus confirm H_1 and H_6 ; however, they do not support H_2 , H_3 and H_5 .

Table 4. 10*Multilinear Regression*

	Model 1			Model 2			Model 3		
	DV = Extent of Disclosure (No of Words)			DV = Extent of Disclosure (No of Sentences)			DV = Quality of Disclosure (Quality)		
	Standardized Coefficients	t	Sig.	Standardized Coefficients	t	Sig.	Standardized Coefficients	t	Sig.
	Beta			Beta			Beta		
F Ratio	4.489(p <0.01)			4.320 (p <0.01)			4.155 (p <0.01)		
R	.347a			.362a			.338a		
R Square	0.1203			0.1312			0.1145		
Adjusted R Square	0.1112			0.1223			0.1053		
Std. Error of the Estimate (Constant)	0.4962			0.6443			0.4252		
		-	0.394		-	0.030		-	0.513
		0.853			2.172			0.655	
BS	0.018	0.399	0.690	0.018	0.401	0.689	0.018	0.389	0.698
Bind	-0.007	-	0.885	0.001	0.022	0.982	0.002	0.033	0.974
		0.145							
BM	0.117	3.158	0.002	0.111	2.975	0.003	0.114	3.032	0.003
BD	0.015	0.439	0.661	0.020	0.553	0.581	0.026	0.719	0.472
SSC	0.073	2.176	0.030	0.074	2.175	0.030	0.072	2.122	0.034
ID	0.329	9.642	0.001	0.314	9.138	0.001	0.303	8.783	0.001
ROE	-0.008	-	0.827	-0.017	-	0.630	-0.016	-	0.645
		0.218			0.482			0.461	
ROIC	0.007	0.210	0.834	0.005	0.161	0.872	0.005	0.136	0.892

Variables Definition:

EID_NOW = No of Word of E-waste Information Disclosure; EID_NOS =No of Sentence of E-waste Information Disclosure; EID_Q = Quality of E-waste Information Disclosure 0 = non-disclosure 1 - a general qualitative disclosure 2 -specific qualitative disclosure 3 - quantitative disclosure 4-quantitative and qualitative disclosure; BS =The total number of the board members in the company (n) ; BInd = The number of independent non-executive directors divided by the total number of directors on board (%); BM =The total number of meetings held by the board (n); BD=The number of female directors divided by the total number of directors on board (%); SSC= The existence of a sustainability steering committee1- exist0- non-exist; ROE = Return On Equity- Return on Equity = Net income / total equity; ROIC = Return On Invested Capital; Net Operating Profit After Tax / Invested Capital ; ID = Industries Difference= The difference of industries selected,1 for technology and telecommunication industry, 0 for other industries N = 799.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

The research covered in the next three sections is summarised in this section. The key findings that support the study's objective are summarised in the first part. The study's limitations are discussed in the next part, and research recommendations for future study are suggested in the last section.

5.2 Discussions on Research Findings

5.2.1 Extent and Quality of E-waste Information Disclosure

The first research aim is to observe the extent and the quality of e-waste information disclosure by Malaysian Public Listed Companies. These companies only have a mean e-waste reporting score between 7.39 words and 0.31 sentences. The results also show that the quality seems to be just between general qualitative disclosure and non-disclosure (quality index mean score = 0.22). These findings are very different from those of a previous study by Nik Azman and Mohd Salleh (2020) but remarkably similar to that of Abd-Mutalib et al. (2021), which show that the sampled firms had low extent and poor-quality reporting in e-waste information disclosure. In their study, Nik Azman and Mohd Salleh (2020) discovered that 57% of the examined companies disclosed their use of e-waste, compared to 8% reported by Abd-Mutalib et al. (2021), and this study's 9.6% disclosure rate from the entire sample is slightly higher. The result may be due to the

authors' sampling technique, which examined e-waste information disclosure, thus concluding that the sampling technique was purposive. For example Abd-Mutalib et al. (2021) only used companies from telecommunication and media industry and technology industry as sample while Nik Azman and Mohd Salleh (2020) has used 59 public listed companies that provided Environmental, Social, Governance (ESG) report. The findings also show that companies have made some progress and dedication in resolving their e-waste and have sufficiently revealed their duties in their reporting, notwithstanding the limited scope and poor quality of e-waste disclosure noted in this study. Other than that, from industry perspective, telecommunication and media industry and technology industry has huge different of e-waste information disclosure than other industries. This may be taking place as a result of Bursa Malaysia's mandate that publicly listed companies in these sectors shall disclose information on their use of e-waste on an annual basis (Securities Commission Malaysia, 2021). These findings and the authority's more forceful pushing could lead to a greater level of e-waste disclosure.

5.2.2 Extent of E-waste Information Disclosure in Telecommunication and Media Industry and Technology Industry

The second goal of this research is to investigate how differently each industries publicly traded Malaysian companies disclose information on e-waste. The companies in the technology and telecommunications business provide e-waste information disclosure that is far broader and more high-quality than those in other industries—nearly six times as much. The scenario could be justified by Bursa Malaysia's mandate that technology and telecommunications companies disclose their e-waste information on an annual basis. (Securities Commission Malaysia, 2021). At the same time, the other industries are not

compulsory. As for now, we can conclude that Bursa Malaysia is on track to achieve this goal.

5.2.3 Board Characteristics on E-waste Information Disclosure

The third goal of this study is to investigate, by drawing upon using the virtue ethics theory, how board characteristics impact the quality of data that is revealed regarding e-waste in publicly listed companies in Malaysia. Board size, independence, board meetings, and the percentage of diversity on the board are used to select board characteristics. According to the study's findings, only board meetings significantly improve all e-waste information disclosure metrics. Because frequent board meetings are associated with moral corporate social responsibility reporting that is consistent with the concept of virtue ethics (Conger et al., 1998; Ntim & Osei, 2011; Odoemelum & Okafor,). Board meetings might inspire an excellent response to buffer a potential crisis during the meeting and enhance ethical acts in disclosing commitment and quality. It shows that when the board meeting is held, the board can focus on the current issues, including environmental issues, environmental strategies, performance, and reporting (Odoemelum & Okafor, 2018). It allows directors to stay informed and up to speed on essential changes inside the firm, allowing them to handle developing critical concerns more quickly (Mangena et al., 2012).

5.2.4 Sustainability Steering Committee Influence on E-waste Information Disclosure

Lastly, this study focuses on the influence of sustainability steering committee on e-waste information disclosure among publicly listed companies based on virtue ethics

theory perspective. Evidence indicate the sustainability steering committee and the sharing of e-waste information have a positive relationship. This happen because the sustainability steering committee assists companies in planning, implementing, and reviewing sustainability policies (Liao et al., 2015). The sustainability steering committee might also improve employee awareness of environmental reporting among a company's board. It helps create environmental awareness to the employees (Dietz et al. 2007). It is worth noting that all behaviours, including ethical behaviour, can be taught through observations and adaptations (Arjoon, 2010). Sustainability steering committee can show the employees of the company the positive traits. Additionally, it has been demonstrated by previous research that the sustainability steering committee has a beneficial effect on environmental reporting (Dietz, 2007; Garcia-Torea et al., 2016; Lau, 2016; Liao, 2015; Peters & Romi, 2011).

5.3 Limitations and Recommendations for Future Study

This study is restricted to cross-sectional analysis employing only publicly listed companies from the main market and randomly chosen 822 Industrial Companies due to time constraints and an extensive data collection approach. This study does, however, have several shortcomings that can be addressed going forward. The annual reports, Data Stream, and the sustainability reports were the first sources where secondary data was obtained. Staff interviews and corporate websites are other sources to be considered in addition to yearly reports. Many businesses do not provide any e-waste data in their annual reports. Even these businesses may have generated and disposed of e-waste, it may not have been disclosed annually because not all businesses are required to do so. These companies would view them as irrelevant or unimportant criteria.

Second, only a few corporate governance and characteristic factors are used in this study. Other researchers may take a broader view of corporate governance factors, such as CEO duality, a Muslim chairman, ownership, and the professional and educational backgrounds of directors and the risk management committee. These limitation reduce the researcher's ability to take a more comprehensive look at the factors that may affect the sharing of information about e-waste under the most recent laws imposed by the Malaysian government.

Other than that, future studies can extend the time to analyse recent information of e-waste information disclosure in line with global trends and legal requirements by the Malaysian government since the Bursa Malaysia requirement for the technology and telecommunication sectors to report e-waste is still new. Bursa Malaysia may gain from improved corporate governance as a consequence, furthering its goal of turning into a sustainable business.

Due to time limits, the study is limited to public listed companies in the main market. For future research, the scope of the population can be increased by including the ace market. Other than that, this study will be limited to up to five board characteristics. More variables can be added in terms of board diversity and board integrity. Lastly, this study will only cover the 2019 to 2021 period. This research can be improved by using a more extensive secondary data range. Lastly, future studies can observe the extent of e-waste reporting using qualitative methods to explain the reporting practices in more depth.

5.4 Summary of study

In summary, this thesis investigates how board characteristics and the sustainability steering committee affect the disclosure of e-waste information. Our comprehension of companies' disclosure of e-waste information is improved by the study's findings. Only the board meeting and the sustainability steering committee, in this specific context, had an impact on the disclosure of e-waste information. Additionally, this study advances knowledge of the impact of board director traits that may enhance future e-waste information disclosure. With more enhancement on e-waste reporting board directors which lead to top management, it can help every company and individual in the company to be more responsible in handling harmful waste. Once this goal has been accomplished, number of unmanageable e-waste can be reduced globally. It can help our community to live in healthier and safer environment.

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