EVALUATION OF AWARENESS, KNOWLEDGE, ATTITUDE, AND OPINION ON ENVIRONMENTAL SUSTAINABILITY AMONG YOUTHS IN PENANG, MALAYSIA

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LIST OF SYMBOLS

z	standard score
Q-Q	Quantile-quantile
P-P	Probability-probability
r	Correlation
R^2	R Square
p	Probability
M	Mean
SD	Standard Deviation
t	Size of difference
d	Effect size

LIST OF ABBREVIATIONS

IPT	Institut Pengajian Tinggi
SPSS	Statistical Package for Social Science
HEIs	Higher Educational Institutions
UN	United Nations
ETP	Economic Transformation Plan
SDGs	Sustainable Development Goals
ESD	Education for Sustainable Development
DESD	Decade of Education for Sustainable Development
GAP	Global Action Programme
EE	Environmental Education
DoE	Department of Environment
MoE	Ministry of Education
NGOs	Non-Profit Organisations
SD	Sustainable Development
MDGs	Millennium Development Goals
OECD	Organisation for Economic Co-operation and Development
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
UNCED	United Nations Conference on Environment and Development
SMK	Sekolah Menengah Kebangsaan (Secondary schools)
SMJK	Sekolah Menengah Jenis Kebangsaan
USM	Universiti Sains Malaysia
CGSS	Centre for Global Sustainability Studies
PT3	Pentaksiran Tingkatan Tiga (Form Three Assessment Test)
SPM	Sijil Pelajaran Malaysia (Malaysia Certificate of Education)
MD	Mahalanobis Distance
VIF	Variance Inflation Factor
CI	Condition Index
ANOVA	Analysis of Variance
UKM	Universiti Kebangsaan Malaysia
UM	University of Malaya
UPM	Universiti Putra Malaysia (UPM)

LIST OF APPENDICES

PENILAIAN KESEDARAN, PENGETAHUAN, SIKAP, DAN PENDAPAT TERHADAP KELESTARIAN ALAM SEKITAR PADA KALANGAN BELIA DI PULAU PINANG, MALAYSIA

ABSTRAK

Kelestarian alam sekitar adalah salah satu tonggak utama pembangunan lestari. Keperluan untuk mendidik dan menyemai kesedaran intelektual mengenai kelestarian alam sekitar adalah memang tidak disangkalkan lagi penting berikutan krisis alam sekitar global. Transformasi intelektual dan tindakan yang mendalam adalah prasyarat untuk pembangunan lestari, dan ini dapat dicapai dengan pengetahuan, kemahiran, nilai, dan sikap yang betul. Sementara itu, objektif kurikulum dalam pendidikan termasuk kesedaran, pengetahuan, dan sikap terhadap alam sekitar telah diterokai dalam kajian terdahulu sebagai cara untuk memperbaiki tingkah laku keseluruhan terhadap alam sekitar. Sebagai tambahan, penglibatan belia dalam menangani isu-isu kelestarian alam sekitar adalah penting untuk pembangunan belia yang positif. Malah, Agenda 21, khususnya pada Bab 25, menegaskan penglibatan belia untuk alam sekitar dan membuat keputusan. Oleh itu, tujuan kajian ini adalah untuk menilai tahap kesedaran, pengetahuan, sikap, dan pendapat mengenai kelestarian alam sekitar di kalangan belia di Pulau Pinang. Satu set soal selidik telah dibangunkan untuk menilai kesedaran, pengetahuan, sikap, dan pendapat belia terhadap alam sekitar. Sebanyak 773 data terkumpul daripada belia di sekolah. menengah dan Institut Pengajian Tinggi (IPT). digunakan untuk analisis data. Data dianalisis menggunakan perisian *Statistical Package for Social Science* (SPSS). Kajian ini mendapati bahawa majoriti remaja mempelajari tentang isu-isu kelestarian alam sekitar melalui laman sesawang. Statistik deskriptif dalam bentuk min telah digunakan untuk menilai tahap kesedaran,

pengetahuan, sikap, dan pendapat tentang kelestarian alam sekitar. Hasil kajian menunjukkan tahap kesedaran, pengetahuan, dan sikap yang tinggi terhadap kelestarian alam sekitar. Selain itu, belia mempunyai sokongan positif tentang nilai dan usaha pemuliharaan alam sekitar. Sementara itu, keputusan ujian *t* menunjukkan terdapat perbezaan yang signifikan antara tahap sikap di kalangan belia di sekolah menengah dan belia di IPT. Hasil kajian menunjukkan bahawa belia yang lebih tua di IPT mempunyai sikap yang lebih positif terhadap kelestarian alam sekitar berbanding dengan belia yang lebih muda di sekolah menengah. Manakala, ujian regresi berganda mendapati terdapat hubungan yang signifikan antara kesedaran dan pengetahuan alam sekitar terhadap sikap yang positif. Hasil kajian ini membuktikan bahawa kesedaran dan pengetahuan alam sekitar berkait dengan sikap pro-alam sekitar. Sebagai kesimpulan, kajian ini menyokong kepentingan inisiatif kelestarian alam sekitar seperti melalui pendidikan formal dan tidak formal dalam meningkatkan tahap kesedaran, pengetahuan, dan sikap belia terhadap alam sekitar. Sebagai tambahan, pendapat belia dari kajian ini boleh menjadi bantuan dan garis panduan bagi Kementerian Pendidikan Malaysia dan pembuat dasar lain untuk mengambil langkah seterusnya untuk membimbing belia dalam memulihara alam sekitar kita.

EVALUATION OF AWARENESS, KNOWLEDGE, ATTITUDE, AND OPINION ON ENVIRONMENTAL SUSTAINABILITY AMONG YOUTHS IN PENANG, MALAYSIA

ABSTRACT

Environmental sustainability is one of the main pillars of sustainable development. The necessity to educate and sow the seed of intellectual awareness about environmental sustainability is unquestionably essential in the wake of the global environmental crisis. A profound transformation of intellectual and action is a prerequisite for sustainable development, and this can be achieved with the right knowledge, skills, values, and attitudes. Meanwhile, curriculum objectives in education, including environmental awareness, knowledge, and attitude have been explored in previous researches as ways to improve the overall behaviour towards the environment. In addition, engaging youth in tackling environmental sustainability issues is critical to positive youth development. Agenda 21, specifically in Chapter 25, stressed the involvement of youth in environment and development decision-making. Hence, the purpose of this research is to evaluate the level of awareness, knowledge, attitude, and opinion on environmental sustainability amongst youths in Penang. A set of questionnaire was developed to evaluate the level of youths' awareness, knowledge, attitude and their opinion towards environmental sustainability. A total of 773 collected data from youths in secondary schools and Higher Educational Institutions (HEIs) were used for data analysis. All data were analysed using the SPSS software. The findings found that the majority of youth learned about environmental sustainability issues through the website. A descriptive statistic in the form of mean was used to evaluate the level of awareness, knowledge, attitude, and opinion on

environmental sustainability. The results showed that youth had a high level of awareness, knowledge, and attitude on environmental sustainability. Also, the youth were supportive in their opinion on environmental sustainability values and efforts. Furthermore, a *t*-test result indicated that there was a significant difference between the level of attitude among youth in secondary schools and youth in HEIs. The findings mean that older youths in HEIs had more positive attitude on environmental sustainability compared to younger youths in secondary schools. Meanwhile, multiple regression tests found that there was a significant relationship between environmental awareness and knowledge towards a positive attitude. The result proved that environmental awareness and knowledge is are related to pro-environmental attitude. In conclusion, this study supports the significance of environmental sustainability initiatives such as through formal and informal education in increasing the level of environmental awareness, knowledge, and attitude of the youth. In addition, the opinion from youth from this research may serve as an aid and guideline for the Ministry of Education Malaysia and other policymakers to take a further step in guiding the youth in preserving our environment.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter reviews the importance of environmental sustainability and education for sustainability to promote awareness, knowledge, and positive attitude towards the environment amongst youth. Besides that, this chapter also reviews the problems of environmental sustainability in Malaysia which occurs due to lack of awareness, knowledge, and good attitude towards the environment. Furthermore, this chapter also review the objectives of the study, its significance, and the definition of key terms in this study.

1.2 Research background

Global environmental crises such as climate change, degradation of land, increase in greenhouse gases, air, and water pollution, and the depletion of the world's natural resources are the result of human's selfish greed in pursuing unsustainable wealth and economic growth. Mat Said, Ahmadun, Paim, and Masud, (2003) stated that the primary reasons of environmental issues is due to uncontrolled human activities. Therefore, to overcome environmental issues, many important parties in the world, including Malaysia are taking necessary steps in recent years to issue better environmental policies and plan of action for environmental protection. For example, in 2015, countries of the world had committed to the Paris Climate Agreement to tackle global climate change. The agreement aims to limit global warming to below 2°C above preindustrial levels and pursuing means to limit the temperature increase to 1.5°C (Roelfsema et al., 2020). Consequently, during the United Nation (UN) Climate Action Summit in 2019, environmental groups and climate activists had urged global

political leaders to take stronger climate action and the political and business leaders had offered their commitments to achieve net-zero gas emissions by 2050 to avoid the worst effects of global warming (Sengupta and Friedman, 2019).

Malaysia is a developing country that is blessed with various natural resources such as tin and minerals and has a diverse flora and fauna with rich rain forests. Malaysia also produces petroleum products, gold, bauxite, silica sand, limestone, timber, palm oil, natural rubber, tobacco, and pepper (Bada, 2018). Malaysia has transformed itself from an agrarian state to an industrialised state by exploiting the natural resources base available in the country (Mokthsim and Salleh, 2014) and its goal is to become a high-income nation by the year 2020. Malaysia too is committed in the fight for environmental sustainability. New legislation, policies, and action plans were introduced in Malaysia in pursuing green growth and environmental sustainability. The significance of environmental sustainability was emphasized by the government since the Third Malaysia Plan (1976-1980) (Tedong, Wan Abd Aziz, and Zyed, 2020). Furthermore, Economic Transformation Plan (ETP) was initiated by the government to focus on sustainable energy while the Renewable Energy Act (2011) was introduced to boost renewable energy growth in Malaysia (Tedong et al., 2020). Moreover, on September 2015, Malaysia has adopted the 2030 UN Agenda for Sustainable Development Goals (SDGs) (Tedong et al., 2020). Additionally, to manage the problem of disposable plastic pollution, all state governments in Malaysia have expressed support to implement the No Plastic Bag Campaign initiative starting in December 2020 to encourage the green lifestyle among Malaysians (BERNAMA, 2020). These efforts show that the government has already taken gradual steps in achieving environmental sustainability.

In addition to efforts to strengthen policies, the role of education is important in achieving sustainability goals. Choi and Didham, (2011) mentioned that education is the basis to tackle sustainable development challenges as it offers individuals with the knowledge and skills to make smart decisions. According to UNESCO, (2005), education should be cultivated to improve the quality of the environment and human life. Education for Sustainable Development (ESD) focuses for a scientific and balanced curriculum that will incorporate significant sustainable development concerns in academic teaching and learning (Reza, 2016). Besides, ESD also highlight on the critical development challenges, including climate change and disaster risk reduction, so to empower future leaders to ensure sustainability in their social systems (Reza, 2016). Hence, the Decade of Education for Sustainable Development (DESD) was launched in 2005 and ended in 2014. DESD's main goal was to establish the philosophy, ideology, and activities of sustainable development into every level of education that encourage behavioural changes for a sustainable future (UNESCO, 2005b). After that, Global Action Programme (GAP) was introduced at the World Conference on Education for Sustainable Development as a link between efforts to strengthen the sustainable development agenda through education. GAP concentrates on developing and increasing ESD activities to boost development towards sustainability (UNECSO, 2015). Consequently, ESD is increasingly recognised as a fundamental influence in nurturing awareness and developing a positive attitude towards the environment.

The Malaysian National Policy on the Environment has outlined 'Education and Awareness' as one of the Green Strategies in line with the recommendations of Agenda 21 of the UN (MOSTE, 2002). Additionally, environmental education (EE) has been implemented in the Malaysian education system since 1998 (Jannah, Halim,

Meerah, and Fairuz, 2013). Aminrad, Sayed Zakariya, Hadi, and Sakari, (2013) reported that EE is found across school curriculums in Malaysia. In secondary schools (for 13-17 years old), EE is integrated into subjects such as geography, science, moral education, and life skills (Said, Yahaya, and Ahmadun, 2007). According to Corcoran et al., (2012), EE is an 'instrument that contributes to behavioural changes to ensure a sustainable society.' Furthermore, Aminrad et al., (2013) stated that EE helps to achieve awareness, knowledge, attitude, and responsible behaviour towards the environment. Similarly, Yahya, (2020) expressed that EE is to develop youth awareness and knowledge of environmental protection issues so that they can practice healthy lifestyles and promote a sense of responsibility.

Schools and other educational institutions play an important role in determining the successful implementation of EE among the students. The Department of Environment (DoE) in cooperation with the Ministry of Education (MoE), had initiated the *Anugerah Sekolah Lestari* (Sustainable School Award) in 2005 to encourage schools to practice environmental principles (DoE and LESTARI, 2004). At the tertiary level, the government had developed ESD initiatives lead by top universities in Malaysia. The ESD initiatives are:

1. Creation of research centres for sustainability studies
2. Creating a sustainability curriculum framework
3. Creation of regional and national networks on sustainability

Besides that, there are specialised short courses and training programmes organised by universities to increase awareness and enhance local capacity to manage the environment (Corcoran et al., 2012). Furthermore, formal environmental education

curriculum is usually focused on tackling environmental challenges such as littering, air and water pollution, and loss of biodiversity (Corcoran et al., 2012). Besides formal education in educational institutions, the non-governmental organisations (NGOs) and relevant industries are also involved in implementing environmental education to students and the public through activities including talks, workshops, seminars, exhibition, radio shows, competitions, clean-up campaigns, camping and tree planting (Said et al., 2007). In general, education and educational institutions really play an important role in implementing and spreading the values and elements of environmental sustainability to the public specifically among the young generation or youth.

The youth of today are a group of people that play a serious part in supporting the implementation of sustainability policies and goals. The UN also has acknowledged youth as agents of change for the present and future generations (UN, 2015). Moreover, in Agenda 21 specifically in Chapter 25 had stressed the importance of involving youth in relevant levels of decision-making processes for their own future (UN, 1992). In addition to their intellectual input and their potential to mobilise support, youth could bring unique perspectives that need to be considered (UN, 1992). Besides that, engaging youth in environmental programs is vital as they a large group of people with 2.8 billion worldwide population (Joha, 2018). Whereas, youth in Malaysia constitute 31.7 million or 46 percent of total population (Joha, 2018). Thereby, their large population makes it essential to ensure they have the right knowledge, understanding, and awareness of environmental sustainability to make smart decisions, help them ready to work for achieving sustainable development goals and becoming responsible citizens.

Nevertheless, lack of education, knowledge, and awareness regarding sustainability values and attitudes amongst youth need to be improved (Yahya, 2020). Furthermore, as future leaders, it is important to learn, understand, and measure youth's opinion on sustainable development and pro-environmental behaviour (Yahya, 2020). Choudri, Baawain, Al-Sidairi, Al-Nadabi, and Al-Zeidi, (2016) suggested that examining the people awareness, concerns, and perceptions on environmental problems give significant information to make important decisions. Therefore, it is essential to investigate the level of youth awareness, knowledge, attitude and opinion on sustainability as a valuable tool for policy making. It can also provide useful evidence to assess the effectiveness of EE on the level of youth awareness and knowledge concerning environmental sustainability. According to Michalos et al., (2015), there has been limited evidence that education can influence knowledge, attitudes, and behaviours. This research fills this gap by evaluating the effect of awareness and knowledge towards youth attitude concerning environmental sustainability values. This research also aims to better understand the current levels of youth awareness, knowledge, and opinion on environmental sustainability. Additionally, with the collected information, this research can produce a baseline data to assess changes in levels of awareness, understanding, and knowledge over the next years among the youth population.

1.3 Research problems

Rapid industrial and urban development in Malaysia has caused several environmental damages including air pollution, deforestation, soil erosion, and river pollution. There are various environmental policies and laws which has been introduced to prevent more environmental damages and for future environmental

protection. Nevertheless, it has been observed that environmental awareness among the general public is still poor and inadequate (Khalil, Husin, Mahat, & Nasir, 2011). Several studies in Malaysia showed that understanding and awareness on sustainability were at unsatisfactory level (Abolore, 2012; Karpudewan, Ismail, & Mohamed, 2013; Nazirah, 2010). Moreover, the citizen's low attitude is among of the reasons that constitutes to environmental issues, particularly in developing countries (N. Khalil et al., 2011). Inglehart, (1995) proposed that the success of government plans and strategies developed to address environmental problems can only be accomplished with public's support for environmental protection. Moreover, Mohamed, Wee, Chen, Masrom, and Abd Rahim, (2015) reported that the lack of knowledge transfer in local governments has jeopardised the implementation of sustainable development agenda. Besides, there is often a lack of understanding and awareness of sustainability issues within university communities, leaving them in confusion and lack of dedication to implement sustainability agendas (Ralph and Stubbs, 2014). Thus, lack of awareness, knowledge and acceptance of environmental sustainability concept can act as barriers to implementation this concept in the country.

Education is necessary for fostering sustainable development and strengthening the ability of individuals to tackle environment and development issues (Reza, 2016). Besides, it is vital to evaluate how students are learning from these approaches of sustainability and how these approaches are developing their feel of accountabilities to apply those in their practical life (Reza, 2016). Moreover, Reza, (2016) also indicated that studies on the effectiveness of teaching-learning programs are still lacking. In addition, Wang et al., (2013) noted that studies on the growth in educational efforts on sustainability in higher education, that were stressed on education, research, outreach and greening campus operations in universities were

largely carried out in the context of developed countries instead of developing countries.

On the other hand, youth participation in pro-sustainability activities does not meet the expectations even with constant attempt to promote environmental sustainability amongst youth in Malaysia (A. L. Ahmad, Rahim, Pawanteh, & Ahmad, 2012; Said et al., 2007). Besides that, Riemer, Lynes, and Hickman, (2014) argued that many more empirical studies and evaluations on youth are needed as too little is known about which non-formal programmes are truly effective in engaging young people on youth-based programmes. Hence, it is useful to focus this research on youth to understand their attitude towards environmental sustainability.

1.4 Research objectives

The objectives of this research are as follows:

1) To measure the level of awareness, knowledge, attitude, and opinion on environmental sustainability amongst youths in Penang.
2) To evaluate the differences in the attitude scores amongst youths in secondary schools and youth in HEIs in Penang.
3) To determine the relationship of awareness and knowledge scores with attitude on environmental sustainability.

1.5 Research questions

From the above specific research objectives, this study had developed several research questions as follows:

1) What is the level of environmental awareness, knowledge, and attitude, and opinion on environmental sustainability amongst youth in Penang?

2) Is there a significant difference in the attitude scores amongst youths in secondary schools and youths in HEIs in Penang?
3) Is there any significant relationship of awareness and knowledge scores with attitude on environmental sustainability?

1.6 Significance of the research

Firstly, the findings of this study will be useful to help better understanding youth's awareness, knowledge, attitude as well as their opinion concerning environmental sustainability values and its challenges in the current time. Apart from that, this study involving youth reflects the critical role they play in decision-making and protection of the environment. As believed by Riemer et al., (2014), youth are the key stakeholders in the quest to address the threat that environmental issues pose to the future generation.

Whereas, the instrument developed in this study will provide the basis for further research related to the awareness, knowledge, attitude, as well as opinion on environmental sustainability. Furthermore, this study will also provide information to educational planners and other researchers to rethink and reform the educational curriculum with better and meaningful education values.

Most importantly, this study serves as a guideline for the MoE and policymakers in improving the current policy and education curriculum in response to the current level of awareness, knowledge, attitudes, and opinion on environmental sustainability. On top of that, this study is in line with the UN Sustainable Development Goals, which is for Quality Education (Goal 4). Additionally, this study also fills the gap and provides evidence that environmental awareness and knowledge could contribute to a high level of environmental attitude.

1.7 Definition of key terms

a) Environmental sustainability

In defining the term environmental sustainability, Goodland, (1995) stated that environmental sustainability is the 'maintenance of natural capital.' Natural capital or the natural environment refers to the "stock of environmentally provided assets," including soil, atmosphere, forests, water, and wetlands that are renewable or non-renewable and marketed or non-marketed (Goodland, 1995). Similarly, environmental sustainability, according to Hák, Janoušková, and Moldan, (2016), is "maintaining and improving the integrity of the Earth's life-supporting systems." Meanwhile, Sartori, Latrônico, and Campos, (2014) had described sustainability as a process and mechanism to achieve the intended sustainable development. Therefore, environmental sustainability refers to a state of stability, resilience, and interconnectedness that allows human society to satisfy its needs while maintaining the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs (Morelli, 2013).

b) Environmental education

Filho, (1997), refers to EE as the process of understanding the value of the environment and the importance of environmental resources, intending to encourage people to use such resources more sustainably. Meanwhile, UNESCO, (1978) describes EE as a process of developing a global population that is conscious of and concerned about the environment and its issues, and which has the knowledge, skills, attitudes, motivations, and commitment to solving current problems and the prevention of new ones. Besides, environmental education also is a process that prepares people to prevent and solve environmental problems (Day & Monroe, 2000).

c) Youth

In general, youth is a phase between children and adults. Moreover, the age at which a person is considered 'youth' varies worldwide. The UN, for statistical reasons, defines youth as people between the ages of 15 to 24 years old (United Nations, n.d.). In Malaysia, youth refers to young men and women between the ages of 15 and 40 years (Official Portal for Ministry of Youth and Sports, n.d.). In 2019, an amendment was passed by the *Dewan Rakyat* to change the definition of youth as individuals between the ages of 15 and 30 (Yunus & Landau, 2019).

d) Environmental awareness

Environmental awareness refers to one's capabilities to understand the relationship existing "between human activities, the current status of environmental quality, and willingness to take part in environmental activities" (Du et al., 2018) Similarly, Hassan, Noordin, and Sulaiman, (2010) understand the context of environmental awareness as a concept that consists of the emotional, attitude, and practice of sustainability awareness. Mei, Wai, and Ahamad, (2016) suggested that combining psychological and emotional factors drives individuals to perform environmentally-friendly actions. Lastly, Lavega, (2004) defines environmental awareness as developing concern and sensitivity towards the environment and its problems.

e) Environmental knowledge

Environmental knowledge refers to information on environmental issues and the capability to incorporate fully by the personal learning process (Zareie & Navimipour, 2016). The learning process is rooted in several factors that are

socioeconomic, political, cultural, historical, and ecological (Ramdas & Mohamed, 2014). Besides that, Burchett, (2015) described environmental knowledge as a measure of an individual's understanding on the interactions of people and their environments, environmental issues, and the various connections in ecological systems. In a simple definition, environmental knowledge is to have experiences and a basic understanding of the environment and its problems (Lavega, 2004).

f) Environmental attitudes

Pepper and Leonard, (2016) regarded environmental attitudes as a person's opinions on the importance of the environment and people's obligation and role in the environment. While Brick and Lewis, (2014) explained environmental attitudes as individual attitudes for favouring or loathing any issues related to the environment. Lokhorst, Hoon, Le Rutte, and De Snoo, (2014) defined environmental attitudes as individual continuous inner consciousness, assessment, and intention towards environmental issues. Generally, environmental attitude referred to people's values, feelings of concern, and motivation towards the participation of environmental improvement and protection (Lavega, 2004).

g) Opinions

Opinions can be referred to as a method of communication (Stockmann & Luo, 2017). Besides that, (Converse, 1987) described public opinion as the understanding on public matters believed by the individuals who kept themselves aware on such issues.

1.8 Organisation of thesis

Chapter 1: Introduction

The first chapter introduces the background of this study. The research problems, which served as input for this study, are also elaborated. Then, the research objectives and research questions are addressed. The significance of this research, definition of terms used in this study, and the flow of this study are also outlined.

Chapter 2: Literature Review

The significance of AKA, opinion, and age difference as the subject in this research is explored in this chapter. Besides, this chapter reviews past works of literature that are related to the research.

Chapter 3: Methodology

This chapter details step-by-step the procedures employed in this research. It includes the research design, data collection, sample study, procedure, pilot study, and data analysis.

Chapter 4: Findings and Discussion

This chapter presents the result of data analysis and its interpretations of the data. Also, this chapter discusses the findings from the data analysis.

Chapter 5: Conclusion and Future Recommendation

The last chapter of this study presents some concluding remarks on the present study. Additionally, this chapter also explains the limitation throughout conducting this study as well as some suggestions for further study.

1.9 Summary

This chapter discusses on background of this research, the problems in this research, the purpose of research, significance of this research, and definitions of the main terms used in this research. The aim of this research is to evaluate the level of AKA and opinion on environmental sustainability among youths. Besides that, this research also aims to identify the difference in the environmental attitude between youth in secondary schools and youth in HEIs. Lastly, this research intends to determine whether the combination of environmental awareness and environmental knowledge will lead to a better environmental attitude. The following chapter will discuss previous studies related to the topic of this research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter presents past discussion, literature, and research related to environmental education, educational institutions, youth, AKA, and opinions towards environmental sustainability. This chapter ends with the conceptual framework of this research.

2.2 Sustainable development

In 1987, the UN World Commission on Environment and Development or famously known as the Brundtland Commission issued its report (*Our Common Future*) on the danger of unlimited economic advancement towards humankind and the Earth's natural resources. *Our Common Future* became the most commonly read UN report in history and it led to the Earth Summit in Rio where over 100 leaders of states and governments dedicated themselves to amend the policies that were at the cause of ongoing environmental destruction and to undertake a rapid change towards sustainable forms of development (Borowy, 2014). In addition, the Brundtland Commission also set the framework for the ongoing discussion on the relationship between the environment and the economy and on the issue of climate change as reflected, for example, in the 2002 and 2012 Summits on Sustainable Development (Borowy, 2014).

Furthermore, the term 'Sustainable Development' (SD) has been defined in the report as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 41). The Brundtland Commission's definition of SD acknowledged the need to respect the rights of future generations and the need to live within nature's limit. Several years later, the

quest of SD is declared as a major policy goal of many global institutions including the UN, the World Bank, and the World Trade Organisation (Elliott, 2013). Thus, we arrive at the age of sustainable development.

SD promotes a set of goals to which the world should pursue (Sachs, 2015). For instance, Sustainable Development Goals (SDGs) are widely adopted by countries around the world to help drive the future direction of economic and social development as well as environmental protection from human-induced degradation (Sachs, 2015). Thus, sustainable development proposes a comprehensive framework that aims for balance development in economic, social, and environment.

2.3 Environmental sustainability

The aim of environmental sustainability is to preserve human life support systems. The shift to environmental sustainability is critical as the global life support systems continues to deteriorate (Goodland, 1995). Meanwhile, social and economic sustainability are equally important for sustainable development, but, environmental sustainability is a requirement to make development stable (Goodland, 1995). Goodland, (1995) further explained that environmental sustainability strives to improve human welfare and natural capital for human needs within the limitations of the environment, so as to prevent harm to humans. Furthermore, Ekins, (2011) stressed in his article that the efforts to achieve environmental sustainability should now take precedence over economic growth. According to Ekins, (2011), the ecosystem perform several environmental functions for human benefits such as provision of resources and absorption of wastes. Overall, the ecosystem functions offer significant benefits for humans including inputs into the economy and the maintenance of conditions beneficial to human health and human welfare (Ekins, 2011). Besides that, Morelli, (2013)

proposed that a sustainable environment is not dependent on either society or economic sustainability. In fact, without a sustainable environment such as clean air and clean water to supply a resource foundation, it would be difficult to have a sustainable society (Morelli, 2013). In addition, without a steady flow of material, energy, and environmental resources, economic systems will fail (Morelli, 2013). Therefore, social and economic sustainability could not be achieved without environmental sustainability.

The definition of environmental sustainability is the "maintenance of natural capital" (Goodland, 1995). Natural capital is the environmentally provided resources that are renewable and non-renewable including soil, atmosphere, forests, water, and wetlands, which deliver a flow of valuable goods or services (Goodland, 1995). Besides that, the Organisation for Economic Co-operation and Development (OECD) Environmental Strategy defines environmental sustainability with four specific criteria: (1) regeneration - systematic use of renewable resources that does not exceed their long-term rates of natural regeneration, (2) substitutability – systematic and limited use of non-renewable resources which can be balance by substitution by renewable resources, (3) assimilation - releases of hazardous materials to the environment shall not exceed its assimilative capacity, and (4) avoiding irreversibility – irreversible adverse effects of human activities on ecosystems (OECD, 2001). Next, Ekins, (2011) defined environmental sustainability as the "maintenance of environmental functions" which provide a significant contribution to human welfare. Also, Moldan, Janoušková, and Hák, (2012) suggested that environmental sustainability is to sustain the integrity of the nature's life supporting systems at a suitable level. Other than that, Morelli, (2013) specified environmental sustainability as a state of balance that allows people to fulfil its demands without exceeding the capacity of its supporting ecosystems to further

regenerate the services needed to meet those needs without lessening biological diversity. Thereby, environmental sustainability is about limiting the use of renewable and non-renewable natural resources that the people depends on.

2.4 Education for environmental sustainability

Education plays a significant role in changing how people think and act in their daily life. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) stated that "education at all levels can shape the world of tomorrow, equipping individuals and societies with the skills, perspectives, knowledge, and values to live and work in sustainable manner" (UNESCO, 2009).

The idea concerning education for environmental sustainability was captured in several conferences and declarations. The 1972 UN Conference on the Environment presented 26 principles to accomplish environmental sustainability. Principle 19 specified the need for EE from young until adulthood with the objective to develop the basis for an informed opinion and responsible behavior by individuals, enterprises, and communities in conserving and improving the environment (UN, 1972). Besides that, the first Intergovernmental Conference on Environmental Education that was held in Tbilisi in 1977 stressed the role of education in facing the challenges of environmental problems. The Tbilisi Conference suggested that formal and informal EE should be provided to the public (children, youth, and adults) and many occupational groups whose responsibilities bear directly on environmental problems such as engineers, planners, architects, teachers, and industrial managers (UNESCO, 1978). The goal for EE is to help people to understand the complexities of the environment and the need for people to accommodate their activities and continue their development in ways that will not harm the environment (UNESCO, 1978). Another conference that was dedicated to

environmental sustainability is the United Nations Conference on Environment and Development (UNCED) which took place in Rio de Janeiro in 1992. A historic document that is Agenda 21 was a product of the conference. Chapter 36 of Agenda 21 particularly discussed challenges related to sustainability in education (UNCED, 1992). Chapter 36 acknowledged a lack of environmental awareness across the world, and identified formal and informal education to schoolchildren, university graduates, and local communities as a solution to environmentally unsustainable behaviour (UNCED, 1992).

Meanwhile, in Malaysia, education has been one of its key policy areas since independence (Corcoran et al., 2012). Education is considered as an important strategy in the development process of Malaysia (Abdul Rahman and Mahani, 2007). Furthermore, education is a central factor in developing public knowledge and awareness on environmental issues (Esa, 2010). In addition, education is vital for increasing the capability of the public to tackle environment and development problems (Reza, 2016). Hence, EE was emphasized into Malaysia's educational system so as to make the public especially the young generation understand the importance of sustainable development (Jannah, Halim, Meerah, and Fairuz, 2013).

Many educational scholars supported the idea of EE as it helps in raising awareness, knowledge as well as contributes to change of attitudes and behaviour towards environmental sustainability (Jannah et al., 2013). Several scholars also acknowledged that EE help creates awareness, concern, recognition of the consequences of their actions and thus practising an environmentally responsible behaviour (Bradley, Waliczek, & Zajicek, 1999; Fien, 1997; Salequzzman & Stocker, 2001).

In general, it is a necessity for people to have a basic knowledge from the natural and social sciences to understand the principles of environmental sustainability, how they can be implemented, the values involved, challenges in its implementation as well as implications of their implementation. Therefore, for this research, EE is seen as an effective form for youth to acquire awareness, perspectives, values, knowledge, and positive attitude to live sustainably in their surroundings.

2.5 The role of youths in environmental sustainability

Youth, as the future leaders and agents of change, are essential to environmental sustainability. Riemer, Lynes, and Hickman, (2014) believed that environmental engagement efforts could be targeted at different age groups, including children, youth (age 13-18), young adults (age 18-25), and adults older than 25. Specifically, youth and young adults are a good target group for environmental engagement for various reasons, such as:

1) During this period, people usually form their identities that can sustain throughout their lives. Hence, it is significant that young people see themselves as active participants in their communities.
2) Youth are instrumental in relaying messages to different groups, such as family members and members of their communities.
3) Youth are most likely to keep themselves updated on environmental issues through modern technologies such as the Internet and social media (Riemer et al., 2014).

In addition, the risk that global climate change and environmental deterioration create for future generations makes youth key stakeholders to address environmental issues through social change (Riemer et al., 2014).

2.6 Awareness, knowledge, and attitude on environmental sustainability

The primary goal of EE is to offer every person with chances to acquire the awareness, knowledge, attitudes, skills, and participation needed to safeguard and improve the environment (UNESCO, 1978). Nevertheless, the importance of environmental awareness, knowledge, and attitude are the three concepts that frequently mentioned in the literature. Nazirah, (2010) believed that efforts toward sustainability are immensely determined by awareness, knowledge or understanding of the behavioural impact of a personal deeds.

Several studies have emphasized that a healthy environment relies on the level of knowledge, attitude, values and practices of the people (Mansaray & Abijoye, 1998; Schulitz & Oskamp, 1996). Furthermore, in the opinion of Madsen, (1996), the concept of awareness is the driving force that stimulates knowledge. Madsen further explained the recognition that environmental problem exists requires being more aware of the facts about the state of the environment. “This degree of environmental awareness involves a personal commitment to work to solve environmental problems” (Madsen, 1996). Moreover, there are three levels of awareness. They are the fundamental belief of an environmental problem, factual and scientific knowledge, and a commitment to solving environmental problems (Madsen, 1996). Besides that, Lavega, (2004) stated that the three components that are awareness, knowledge, and attitude towards the environment play an essential role in the impact students will have throughout their lives inside and outside the classrooms.

Nonetheless, a study by Stamm, Clark, and Eblacas, (2000) conducted at a metropolitan area, reported that residents were well aware of global warming and climate change but were inadequately informed about the reasons and consequences those environmental issues and possible solutions to both issues. Further, the research

suggested that mass media and person-to-person communication can positively contribute to understanding, as well as to perpetuate prevailing misconceptions.

Further, a study on students' (12 to 13 years old) understanding of sustainability by Walshe, (2008) using concept-mapping and semi-structured interviews revealed that the students possessed expressed better understanding of sustainability through interviews rather than in concept-mapping. More importantly, the students had a broad understanding of sustainability.

Apart from that, a survey aimed at highlighting the public attitudes and understanding of climate change and global warming in Southern England revealed that the general public has extensively recognised the existence of both environmental issues, although the majority regarded global warming as more critical (Whitmarsh, 2008). Nonetheless, most respondents collectively agreed that both issues are significant, and immediate strategy like government financial incentive was suggested for specific pro-environmental actions to elicit changes in behaviour among the target audiences effectively.

Then, Burmeister and Eilks, (2013) reported that practices focusing on ESD are not often put into practice in many educational disciplines, specifically in chemistry teaching in German. Hence, the researchers conducted a study on the level of knowledge and attitudes toward sustainability and ESD among student teachers and trainee teachers in German secondary school chemistry education. The study found that most of the teachers lacked any theory-based knowledge about ESD. Besides that, the teachers may not possess highly-developed knowledge on the topics of sustainability and ESD. Further, the teachers demonstrated that learning about sustainability and promoting ESD seems to be a low priority for them. The researchers explained that the teachers were sceptical of any related pedagogies, which may aid them in connecting ESD to

chemistry education. Even so, when the teachers showed a high level of support when asked to rate the importance of ESD in general and chemistry education. The result means that the teachers showed a positive attitude regarding ESD and acknowledge the importance of ESD for chemistry education. Additionally, the teachers conveyed that chemistry, biology, politics, and economics subjects might be the best for promoting ESD.

Another interesting study by Michalos et al., (2015) was to measure progress in knowledge, attitude, and behaviour toward sustainable development among Tenth-grade students in Manitoba after several years of ESD introduction in their education system. The theory for this study was that knowledge and pro-sustainability attitude will initiate positive behaviours. The findings found that prolonged revelation to education generate more positive outcomes compared to brief exposure of 1 or 2 years. Moreover, the researchers also recommended to go over the range of conventional education in shaping and strengthening students' understanding and knowledge of sustainable choices and actions.

Nousheen, Yousuf Zai, Waseem, and Khan, (2020) conducted a study to assess pre-service teachers' attitude concerning sustainable development at the beginning and at the end of the course namely "Education for Sustainable Development". Several approaches and teaching plans were applied to improve pre-service teachers' awareness and attitude, including course materials, assignments, projects, classroom discussion, and presentations. Then, respondents were divided into 2 groups. The first group is the experimental group who had taken the course while the second group is the controlled group, who did not study the course. The results of quantitative and qualitative data suggest a positive change in the awareness, understanding, and attitude of the respondents in experimental group after taking the course. Meanwhile, there is no

changes in the attitude of the controlled group towards sustainable development. Furthermore, the experimental group respondents also engaged themselves in pro-environmental behaviours such as saving water, reusing, and planting trees. The researchers also stressed to utilise a mixed method technique such as critical action research, participatory experiences, group discussion, and presentations to achieve the short and long term objectives of education for sustainable development. Additionally, the researchers proposed that education has a significant impact on the respondents' attitude towards sustainable development. Therefore, education should be included into different courses to optimise the role of education in achieving sustainable development (Nousheen et al., 2020).

In the context of Malaysia, several studies were conducted in regards to the level of environmental awareness, knowledge, and attitude towards environmental sustainability. Mat Said, Ahmadun, Paim, and Masud, (2003) carried out a study to determine the level of environmental knowledge, concern, consumer behaviour, and involvement in nature-related activities of the teachers in Selangor. The result indicated that respondents were aware of common environmental problems and the impact of human activities on the environment, such as pollution, deforestation, flash flood, and land degradation, but lacking in understanding the underlying causes of the environmental problems. Respondents also mentioned that the government, private sectors, and individuals are all responsible for maintaining and protecting the environment. The study concludes that having considerable knowledge of environmental sustainability does not affect environmentally responsible behaviour among school teachers.

Next, Sumiri, (2008) conducted quantitative research on the level of understanding on environmental sustainability among pre-school teachers, secondary