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**ATTITUDE AND AWARENESS OF UNIVERSITY TEACHERS
TOWARDS IMPLEMENTING SUSTAINABLE DEVELOPMENT
GOALS IN PUBLIC UNIVERSITIES IN MALAYSIA**

Master's thesis

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I hereby declare that I have compiled the thesis independently and all works, important standpoints, and data by other authors have been properly referenced, and the same paper has not been previously presented for grading.

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ABSTRACT

Education is the central pole for sustainable development goals. universities are the leaders because they can make social changes for the benefit of societies. They have the potential to extend support for sustainable development for education. But SDG in universities is still in infancy, and the low implementation of SDG is found in many universities in other countries. Malaysia is one of the leading countries implementing SDG in universities. But many studies found that the attitude of Malaysian university staff was positive, and at the same time, awareness was low. These contradictory opinions of studies influence the researcher to measure the attitude and awareness towards implementing SDG in Malaysia. The main aim of the study is to find out the attitude and awareness of university teachers towards implementing SDG in public universities in Malaysia. This study measured the aspects of quantitative research methods. Samples of the study are university teachers who pick out convenience sampling methods. Such samples acquire from five public universities. Some of the selected University of Malaysia, University of Putra Malaysia, University Malaya and University Teknologi Malaysia and University Kebangsaan Malaysia. After determining the samples, this study uses a self-structured questionnaire in gathering opinions from the respective samples. Statistical tools are utilised in measuring the awareness and attitude of sustainable development goals. The outcome reveals that the university teacher's awareness and attitude of SDG are low and moderate, respectively. University teachers' differences in awareness and attitude in terms of the demographic profile are not statistically significant for gender, program, age, and education. The science university teachers statistically differ from non-science major teachers. Finally, the study concludes that universities have to take steps to enrich the knowledge of university teachers and successfully implement sustainable development goals in the public universities in Malaysia.

Keywords: sustainable development goals, university teachers, awareness and attitude

INTRODUCTION

The agenda 2030 gains attention globally because it covers a wide variety of interrelated goals: from poverty eradication to peace for all by the end of 2030 (El-Jardali *et al.* 2018; United Nations 2017). According to Sustainable Development Goals (SDG), the targets are education, health, energy, food and more (Mawonde, Togo 2019). Among the targets, standalone goals are dedicated to education. It is the central pole for sustainable development goals (Sonetti *et al.* 2020). In education, universities are the leaders because they can make social changes for the benefit of societies (Blasco *et al.* 2021). Forty-two national and international networks have already extended the network to launch SDG in universities (SDG Accord 2017). Universities had an important role in supporting Agenda 2030 in implementing SDG through learning, teaching, research, and curriculum orientation (Purcell *et al.* 2019; Bhowmik *et al.* 2017). Such implementation depends on four pillars: research, education, operation & governance and community (Kestin *et al.* 2017; Bhowmik *et al.* 2017). With the support from the pillars, universities extend sustainable development in education (Torres *et al.* 2017). SDG universities' implementation is still in infancy (Leal Filho *et al.* 2019). It is well known from the studies that implementation of sustainable development for education in universities are moderate (Torres *et al.* 2017).

On the contrary to the above, fair implementation observes in other universities (Omisore *et al.* 2017; Shehu, Shehu 2018). Such a low level of implementation is acting as a threat to implement SDG in universities (Afroz, Ilham 2020; Albahlal *et al.* 2017; Issa *et al.* 2017; Mori Junior *et al.* 2019). Even some more universities are still lacking in raising awareness of education for sustainable development (Kanapathy Junior *et al.* 2019; Manolis, Manoli 2021). On the contrary, some of the previous studies have mentioned that universities are taking steps to increase the awareness through implementation of SDG in university education (Smaniotto *et al.* 2020; Issa *et al.* 2014). Recent studies indicate that quantitative research methods have tackled awareness issues (Smaniotto *et al.* 2020; Alghamdi 2018; Aye *et al.* 2019; Vernia Carrasco *et al.* 2020). Such methods reveal that SDG implementation in universities increases students' awareness of sustainability (Wee *et al.* 2017; Jati *et al.* 2019; Ejechi 2018). Consequently, the study will focus

on measuring the awareness of sustainable development goals for education in universities in qualitative research methods.

Implementation of SDG in university education can be developed through cognitive and affective domains. The study states that factors that determine SDG are education, living environment, and society (Mulder 2017). Out of the factors, the inclusion of sustainability principles in education plays a key role in increasing the attitude toward sustainability (Sidiropoulos 2014). Studies have shown a positive attitude towards SDG in University communities (Omisore *et al.* 2017; Okubo *et al.* 2021; Sunthonkanokpong, Murphy 2019; Balakrishnan *et al.* 2020). Previous studies are directed at measuring the SDG attitude of universities in quantitative research methods. Such studies did not obtain the accurate value of attitude of SDG. So, the study focuses on measuring the attitude of university teachers towards implementing SDG in universities.

Focusing on Malaysia is one of the leading countries in the Asia Pacific region (Knight, Morshidi 2011; Lee 2014). Because some of the models of higher education institutions in the country are public universities, private universities, polytechnics, private colleges and branches of foreign universities (Saadatian *et al.* 2011). The government funds public universities, whereas financially sound corporations fund private universities.

These universities are monitored by Malaysia's Ministry of Higher education (Ilham *et al.* 2020). According to studymalaysia.com (2016), the country has public universities (20), private universities (43), private colleges (31), foreign university branches (9) and polytechnics (34) (StudyMalaysia.com 2016). One public university provides some insights on sustainable education (Crosling *et al.* 2020). Public universities have a workforce of 33000, and the workforce equips with sound knowledge on sustainability (Quantity Surveying 2019; Da Wan *et al.* 2015). Such knowledge raises due to the country support of SDG implementation in public universities (General Mills Global Responsibility 2018). One recent study pinpointed a positive level of understanding and attitude in public universities' academic staff in education for sustainability development (Crosling *et al.* 2020).

In contrast, the lack of sustainability awareness is high in Malaysian universities (Mahmud 2017). Lack of understanding of concepts, lack of teaching skills of ESD teachers act as a threat to the implementation of ESD in the universities (*ibid*). Together, Velazquez *et al.* (2005) highlighted a small number of staff awareness discourages sustainability. Such contradictory opinion influences

the researcher to measure the teachers' attitudes and awareness towards implementing SDG in Malaysia.

Gap: The comprehensive analysis of literature studies observes that the studies focused on assessing awareness and attitude of sustainable development goals. Very few studies assessed the university teachers' attitudes towards SDG. Hence, the author identified the gap, executed the study through a selected research method. The study focuses on addressing the gap through quantitative research methods. A detailed description of how to carry out the research is presented in the subsequent section.

Aim: The Master thesis aims to find out the attitude and awareness of university teachers towards implementing SDG in public universities in Malaysia.

Research questions

- 1) What is the awareness of university teachers towards implementing SDG in public universities in Malaysia?
- 2) What is the level of attitude of University teachers towards implementing SDG in Public universities in Malaysia?
- 3) Is awareness of university teachers differs from the demographic profile of University teachers?
- 4) Does university teachers' attitude differ from the demographic profile of University teachers?

The first chapter is the theoretical background of the study. It contains information on how existing studies made relating to sustainability, Sustainable development goals, strategies for implementing sustainable development goals, SDG in education, Awareness of SDG, attitude towards SDG. The study finds gaps existing from previous studies.

The second chapter represents the research methodology. It includes research methods, samples, sampling technique, data collection, validity, reliability, tools used in the analysis and ethics.

The third chapter is an analysis & findings of the study. It has the subsections like the profile of respondents, the association between awareness and attitude of teachers, a summary of findings, discussion and implications. The last chapter is the conclusion of the study.

1. THEORETICAL BACKGROUND OF THE STUDY

1.1. Principles and roles of sustainability

Sustainability refers to “offering the potential to reduce the long-term risk integrated with resources depletion, volatility in energy costs, product liabilities, pollution and waste management”. The other definition says that the development meets the present generation’s needs without compromising the ability of future generations to meet the needs. The word sustainability indicates integrating social, environmental criteria or qualities in human actions. Sustainability is the actions that are part of social-ecological systems (Salas-Zapata, Ortiz-Muñoz, 2019). Sustainability refers to studying a reference system's economic, social, and environmental variables. Since from 20th century, sustainability concerns have played a key role in thinking about the development and configuration of alternatives. Sustainability indicates the shared purpose or mission of the transformation followed by sustainable development to achieve the strategic mission (Purcell *et al.* 2019). Recently, sustainability and sustainable development are the integral discussion points at major forums (Jacobi 2003). As per (*ibid*), sustainability intends to set growth possibilities limits. It is in charge of outlining the initiatives which take participants and social partners based on their educational practices. It is a dialogical process that strengthens the responsibility of those seeking values. There are 17 goals, and among them, poverty, hunger, health and education are the most important aspects due to fundamental needs. To ensure sustainability, first, need to go through the key indicators which have wide access to play a vital role in sustainable development.

Sustainability indicators would fulfill basic requirements to analyze or evaluate sustainability fairly, safely and competently and present accurate results (Hák *et al.* 2016). According to UNSD (2015), there is a significant necessity to organize the SDG data into a conceptual model. It will ensure that the parameter set is accurate and that links between indicators are highlighted, reducing absurdity in the hiring process (Griggs *et al.* 2013). A comprehensive social and environmental approach for the SDGs controls exchange and optimizes target benefits; the concept and strategies that could be used to construct indicator structure can be split into two groups: Solution based on

strategy and techniques based on concepts (Hák *et al.* 2016). SDG development refers to the process that involves both the generation of scientific evidence and the development of constitutional principles, and both elements must be addressed. These approaches are linked in a completed diagnostic design if the overall process indicates development is well-designed and executed (Rametsteiner *et al.* 2011). Sustainable Development in education (ESD) is such a method of distributing the values and ideals of SD to a large number of people. (Balakrishnan *et al.* 2020). According to Al-Naqbi *et al.* (2018), Education sustainable development is a foundation for synthesizing the right information, abilities, and attitudes to help build the core ideas of SD in academics. In higher education in Malaysia, a wide range of programs is being taught, and sustainable development is one of them. Even though the existing education sustainability understating and practice improved, it has not been recognized by any studies (Reza 2016).

1.1.1. Sustainable development goals

Sustainable development refers to the development that meets the current requirement without compromising the ability of future generations to meet their needs. United Nations initiation has certain targets and goals representing the world's vision. SDG is an international agreement of various countries under UN initiation. The main intention is to develop a global partnership. SDG is keen on eradicating poverty, protecting people and the planet, setting up partnerships, and ensuring prosperity and peace.

UN SDG has one hundred and sixty-nine targets for seventeen goals (Figure 1). It acts as a plan to accomplish a better and more sustainable future for global countries. All the seventeen targets are exhibited in the below diagram.



Figure 1. Sustainable development goals
Source: SDG 2015

As per proposed SDG 2015, the crucial element is education because formal education directs the importance of SDG and its implementation in daily lives. A detailed description of the importance of SDG in education is presented in detail. To ensure the food for all the people worldwide becomes the primary focal point and the need to concern about the environmental issues. (UNDP, retrieved on 10th Aug 2019). Incorporating Zero Hunger into Global Educational Curriculum has a huge impact on nurturing a sustainable society in the future and improving Malaysia's educational standards. (Thomas, Devasia *et al.*).

Among the 17 SDG, clean water and sanitation are of them. Due to fresh water crisis all over the world which has a great impact and 40 per cent is drinking fresh water supply crisis. (UNDP 2019). That means the need to find a sustainable solution for fresh drinking water by 2030. Also, in a study, around four and half billion people are without access to a safe sanitation facility, while more than 2 billion people have no basic sanitation facility. (UNDP 10th Aug 2019). The Sustainable Development Goals (SDGs) provide a holistic view of human needs and wants, including financial, societal, and environmental impacts. Strong connectivity and multiple bridge features from across objectives and outcomes are included in the 2030 plan. (United Nations 2015).

Climate change is one of the major concerns all over the world. Due to carbon emission, the temperature has rapidly increased in the last three decades. It is estimated that greenhouse gas emissions account for more than half of all emissions. As a result, teaching anyone about the greenhouse effects and the drawbacks of progress should be a priority in starting the task to minimize gas emissions. This includes policy, strategy, and preparation to address the problem in each country. (Thomas *et al.* 2020). Although Malaysia holds an excellent performance in eliminating poverty, the current problem is developing inequities among Malaysian's different ethnic groups. But gender equality has a positive sign for Malaysia (Jayasooria *et al.* 2016). The Study from the National Investigation into the Land Ownership of Aboriginal Peoples' by the Malaysian Human Rights Council exposes that crimes against humanity and breaches of aboriginal people's land rights (*ibid*).

Education is the most significant aspect of the 17 SDG of a united nation. The idea of sustainability has also been introduced into university education and local academic institutions. It has already been checked and matched their development strategy and objectives with the 17 Sustainable Development Goals (Choong *et al.* 2020). Furthermore, university staff and teachers were encouraged to avoid plastic which is unfriendly for the environment (*ibid*). There were different papers already published in terms of the goals of 17 SDGs; scientific papers, social inclusion, content generation, seminar and program at universities. The academic institutions have indeed released information demonstrating their pledges and efforts to the 17 SDGs as part of community Agenda 21, a three-level harmonization initiative. (Ang *et al.* 2021).

1.1.2. SDG in education

Education is widely recognized as one of the most important tools for achieving sustainable development (SD). It can encourage people to develop knowledge and awareness of SD and change their behaviours to act in ways that address the sustainability challenges facing humanity. Education is closely engaged with other SDGs, and particularly education is vital for almost all SDGs to be accomplished. Other aspects of SDGs positively impact education (Asongu *et al.* 2019). Education for sustainable development and implementing SDGs in higher education could be a chance to establish synergies between the university's departments, between the university and the society, and between degrees (Silvia *et al.* 2018). Developments in higher education in achieving the SDGs have been reviewed by Moon *et al.* (2018). Higher education institutions' governance is not entirely committed to achieving the SDGs (*ibid*).

Sustainable development goals have not been taken as individual goals. Rather it can be taken as a collective goal. Universities act as actors in the changing ecosystem (Purcell *et al.* 2019). They are helping the world to tackle the constraints indicated in SDG (Trencher *et al.* 2014). Universities are the forerunner of scientific and technological advances engaged in global research. It is educating future leaders and professionals. It can deliver a power effect of knowledge of youth in all sectors across the nations. They are also acting as anchors to serve nationally and internationally. Moreover, they can facilitate change to have an equitable society and create a better world by having SDG at the strategic level. Universities act as a means of connecting education with business, partners, health care and entrepreneurs (Finder *et al.* 2019).

The role of universities is to implement SDG in teaching and learning activities. Some activities include SDG in undergraduate and postgraduate teaching curriculum, offering professional training to the students and teachers, online learning, and student club and societies (Leal Filho *et al.* 2019). SDG in the curriculum is enhancing human actions to live a sustainable life. SDG in education affected securing environmental goals and making a better future (Leal Filho *et al.* 2018). Sedlacek (2013) discussed the strong effect identified with SDG on education. Such an effect offers societal benefits owing to quality education on SDG extends further benefit to institutions and students, contributing to SDG implementation in several levels of education (UG, PG and executive training) (UNESCO 2016; Kestin *et al.* 2017). Quality education plays a crucial role for citizens in enhancing and advancing sustainable development (Annan-Diab, Molinari 2017).

1.1.3. Awareness of SDG

Awareness refers to how social groups and individuals are conscious and sensitive towards the environment (Keleş, Aydoğdu 2010). It can increase consciousness and sensibility in directing the individual behavior (Engin, Çam 2005). Previous studies investigated that education plays a key role in increasing the awareness of SDG (Smaniotto *et al.* 2020; Alghamdi 2018; Sonetti *et al.* 2021; Aye *et al.* 2019). Similar work on awareness of the implementation of SDG has been pursued by others in which quantitative research methods used, indicating the awareness level of education for sustainable development goals (Smaniotto *et al.* 2020; Alghamdi 2018; Sonetti *et al.* 2021; Aye *et al.* 2019; Wahono, Chang 2019; Vernia Carrasco *et al.* 2020). Notably, none of the work discussed considers the teachers perspective of education for sustainable development in

public universities. A descriptive review of the existing studies indicates that quantitative research methods are the most commonly used. So, the present study measures the awareness of implementing sustainable development goals for education in quantitative research methods. Previous studies and their descriptive review is presented in detail.

Smaniotto *et al.* (2020) discuss that Universities in Europe developed, cultivated and implemented SDG in education for both students and teachers. The study aims to measure the university's awareness, attitude, and sustainability knowledge. The author measured through quantitative research methods. Five-point Likert scale questions framed and gathered the opinion through an online questionnaire. Analysis showed that sustainability education increased the awareness of the concepts and encouraged people to stick more to engagement and sustainable behavior. Also, a low percentage of knowledge was observed among SDG educational activities. Thus, the study gives an insight to the researcher that SDG in University education is low but at the same time interest of people is high. Also, the researcher observes that they can measure the aspects through a five-point Likert scale. Therefore, the study aims to replicate a similar kind of Likert scale in the research.

Alghamdi (2018) mentions that sustainable development goals focused on 17 ambitious and 169 challenging targets. Out of the goals, one goal was to increase the awareness of sustainable development in the developing world. Recently, Saudi Arabia launched Vision 2030 focused on a vibrant society, a thriving economy, and ambitious nations. The country is keen on making a massive investment in health, education and infrastructure. Saudi Arabia is cultivating sustainability in youths through universities. Universities act as a medium to resolve the issues through youth. Hence the author focused on measuring awareness and sustainability among Saudi Arabia public universities. The measurement was made through quantitative research methods; a questionnaire was used. The outcome of the study indicated that there was less knowledge observed in universities. Therefore, the study provides knowledge that there is a need to investigate the awareness of sustainable concepts in universities.

Sonetti *et al.* (2021) have discussed that universities act as formal institutions and places where experts' knowledge meets. Sustainable development goals call on orienting institutions and imposing knowledge on future generations. Italy makes a starting step to underpin meaning and relevance about SDG to administrative, teaching staff and students. The survey gathered responses from Italian universities specializing in engineering, industrial design, and architecture.

Findings of the study showed that low consciousness was observed about sustainability and societal challenges. Also, differences of awareness were found between staff, academics and students.

Moreover, dissimilarities of SDG were found between individuals and universities. The researcher observes that the Anova test was used to measure the differences of opinion of the study's staff, academics, and students. Also, the study gives the knowledge to measure the opinion of various specialized universities. Therefore, the researcher has taken the aspects into account.

Alghamdi and El-Hassan (2020) mention that Saudi people are precarious. They are giving more care to sustainability. The findings of the study showed that a deep lack of awareness was observed among students. However, teachers found inquiry-based teaching and learning motivated the students to understand individual actions against climate change. The researcher observes that the knowledge of teaching pedagogy is important for SDG from the study. Also, the study shows that the students found encouraging with the pedagogy. Therefore, the study considers pedagogy in the questionnaire.

Albareda-Tiana *et al.* (2018) discusses the principles and practices of sustainable development in the university education curriculum. Hence, the author aimed to explore the integration of SDG in the learning and teaching practices of the University of Catalonia empirically. Analysis showed that the constraints, difficulty in practices show the starting position integrating to the SDG.

Aye, *et al.* (2019) has stated in the study that the awareness, knowledge, and attitude of sustainable development goals among employees in Malaysia. Assessment of employee opinion provided an outcome that employees had a positive attitude towards sustainable development goals. Moreover, they showed their willingness to have it in teaching subjects.

Nevertheless, the study found low awareness and did not recognize the concepts. It was primarily due to inadequate integration of the concepts into their teaching subjects. Also, no statistical differences were found in awareness & knowledge and attitude of ESD. A significant relationship was found between knowledge, attitude, and teaching skills. Thus, the study concluded that the training program could integrate ESD employees in Malaysia.

Wahono and Chang (2019) discussed the knowledge, attitude, and application of sustainable development in STEM education. The research methods used were qualitative and quantitative to assess the SDG on education. Quantitative assessment is based on demographic data, teachers' difficulties perception, and their contribution to sustainable development. The qualitative analysis was adopted to assess teachers' perceptions of sustainable development. The analysis showed that science teachers had a good attitude but a moderate application level and common knowledge in STEM education. Differences found in knowledge and application of STEM education about education background and teaching experiences. However, no differences were found in teachers' attitudes towards sustainable development in STEM education. Therefore, it concluded that knowledge and attitudes were fundamental domains and proper training to the respective teachers, proper implementation in the schools increases the sustainability of STEM education.

Vernia Carrasco *et al.* (2020) has focused on assessing teachers' knowledge, attitude, and behaviour towards sustainable development goals. The authors focused on Public University teachers in Malaysia. The quantitative assessment found that the sufficient knowledge of the teachers was positive. SDG attitude of teachers was high, and it helped reduce poverty to the maximum. Consequently, the behaviour of teachers towards SDG is low. Hence, the outcome suggested that training and awareness of teachers are essential in implementing the concepts through study programs of importance in knowledge and behaviour.

The author has taken different universities data to examine awareness, knowledge, consciousness concepts to compare SDG awareness in the universities in Malaysia. To find out the awareness of SDG in Malaysia, the study found that awareness was low and did not recognize the concepts. (Aye *et al.* 2019). To measure SDG awareness in universities, it shows that a low percentage of awareness was observed among SDG in universities (Smaniotto *et al.* 2020). Measuring teachers' awareness in Italy shows that low consciousness was observed about sustainability and societal challenges. Different studies have been published on how universities implement the SDGs Among different institutions. Although the research on how universities are implementing the SDGs is still in its primary stage stages (Leal Filho *et al.* 2019; Sonetti *et al.* 2020). It has been observed that for students' independent variables linked with knowledge and awareness of the SDGs and sustainability ideas have been investigated (Omisore *et al.* 2017; ahin, Erkal 2017; Zamora-Polo and Sánchez-Martn, 2019). Measuring awareness of Saudi Arabia public universities less knowledge is observed in universities (Alghamdi 2018). Also examined that the awareness of sustainable development goals. How prospective teachers can employ sustainability pedagogies

and ultimately shows a deep lack of awareness among students. But teachers found inquiry-based teaching and learning motivated the students to understand the requirement of individual actions against climate change. The Knowledge of SDG in STEM education. Assess teachers' perception towards sustainable development, and the result is the Differences found in knowledge and application of STEM education about education background and teaching experiences. However, no differences were found in teachers' attitudes towards sustainable development in stem education (Wahono, Chang 2019). Teachers' knowledge towards SDG is positive, and the SDG attitude of teachers was high, but the behaviour of teachers towards SDG is low (Vernia Carrasco *et al.* 2020)

1.1.4. Attitude of SDG

The antecedent variables associated with attitude have been defined: stimulus and object (Breckler 1984). A reflection of attitudes is in the form of support. Some studies mentioned that attitudes are a psychological tendency to express favour or disfavour agreement towards the particular entity (Eagly, Chaiken 1983). For sustainability development goals, an attitude is a form of scientific literacy that indicates that the individuals actively participate in scientific issues relating to personal life (Schleicher *et al.* 2009). Studies have pointed out that a positive attitude was found in university teachers (Emilzoli, Ali 2021; Maidou *et al.* 2019; Naikoo 2017). Although university teachers have a positive attitude, negative beliefs find high in males and less in females. A detailed description of the attitude of sustainable development goals for the education of individual studies is present below

Emilzoli and Ali (2021) mention the perception, attitude, and lifestyle of sustainable development goals. The descriptive analysis was adopted to assess the aspects, and hence survey technique had implemented. It found an outcome that knowledge of sustainable development goals was inconsistent. A very few had known clearly about the definition of SDG.

Moreover, the attitude of SDG was in a good category which exhibited that the education provided an adequate knowledge of how to behave as per SDG values in their daily activities. But it was not found in the curriculum. Thus, it suggests incorporating sustainable development as a mandatory subject to teach values or activities related to SDG.

Park *et al.* (2016) investigate the perception and attitude of teachers about sustainable development goals. Quantitative research methods in which survey has been conducted among Korean teachers. The survey focused on three domains: understanding concepts of sustainable development, the importance of SDG in education & its implementation, and personal intentions about sustainable lifestyles. The study found that most respondents had a reasonable understanding of SDG from the sources. However, a maximum number of respondents stated that SDG was not properly implemented and executed in their respective institutions. Institutions that had SDG implementations were based on circle time discussions. They had positive intentions about personal practices of a sustainable lifestyle. Hence, the positive values of teachers make it more likely to implement in their classroom. The outcome suggested that teachers offer prospects to implement the concept effectively in their respective institutions.

Maidou *et al.* (2019) question teachers' knowledge, view, and attitude towards SDG at the University of Ioannina. To enquire about the above aspects, the study utilized quantitative research methods in which a questionnaire was implemented. A questionnaire was developed regarding four aspects knowledge, views, attitude, and teaching approaches. The study's findings exhibited that teachers had environmental knowledge but did not prioritize societal and financial aspects.

Moreover, very few had a good knowledge of SDG, whereas others had insufficient knowledge. Consequently, teachers' lack of knowledge left the importance of teachers to sustainable development issues. A small number of respondents had taken an interest in teaching the issues at the classes. Most of the teachers preferred excursions, site visits, and group discussions, whereas less preference was given to guest speakers and case studies. Finally, it suggested including the concept in the curriculum. Therefore, teachers make an effort to develop their ability to teach SDG to students.

Nousheen *et al.* (2020) focus on assessing student-teacher attitudes towards sustainable development. Mixed methods were adopted to evaluate the attitude of both students and teachers in sustainable development. Mixed research methods showed that a positive change was observed in student-teachers attitudes towards sustainable development. Also, the study assessed the attitude of student-teachers during their coursework compared with those who did not study sustainable development subjects. The study found that the knowledge was high for student-teachers during their studies than others. Therefore, the study advocated a requirement of sustainable development in education to enhance students' attitudes towards sustainable development.

Naikoo (2017) discusses the teacher's attitude towards sustainable development in India. The descriptive analysis was adopted; teachers were picked out based on simple random sampling; questionnaires were developed using a five-point Likert scale. Analysis showed that most respondents had a positive attitude towards sustainable development. Also, Male respondents had more awareness of sustainable development than female respondents. Young and energetic teachers were ready to take initiatives about sustainable development. Science teachers were actively participating in sustainable development than others.

Butakor *et al.* (2020) show that countries implemented policies to support sustainable development goals. The policies focused on bringing about education for all students. The Ghanaian country had an inclusive education concept. It offered various learning potentials and cognitive development to students. Hence, the study examines the teacher's attitude towards SDG inclusive education in Ghana. With the help of quantitative research methods, the authors utilized a multidimensional attitude towards inclusive education scale to gather teachers' opinions on SDG. The outcome showed that male teachers had more negative beliefs than female teachers. Also, experienced teachers had a low behavioural attitude than inexperienced teachers. The researcher gained knowledge on factor analysis to get a correlated four-factor for the study. Also, the reliability coefficient was lies between 0.73-0.90. Therefore, the researcher incorporates factor analysis to measure the known correlated items. Also, a reliability coefficient can be adopted to measure the items' reliability.

The author of this study tried to examine the attitude towards SDG by collecting some data from different universities. It has been observed that by measuring the attitude of sustainable development goals, respondents had a positive attitude towards SDG (Emilzoli, Ali 2021). The teacher's attitude towards SDG respondents understood the concepts, but the concepts were not properly implemented. Implementing SDG in teaching through circle time discussion and Positive attitude towards SDG (Park *et al.* 2016). The teacher's attitude towards SDG at the University of Ioannina is slightly different because very few teachers had a good knowledge of SDG, whereas others had insufficient knowledge (Maidou *et al.* 2019).

On the other hand, the teacher's attitude towards sustainable development in India found that most respondents had a positive attitude (Naikoo 2017). A positive change in student-teachers attitudes towards sustainable development was observed (Nousheen *et al.* 2020). Examining the teacher's

attitude towards SDG inclusive education in Ghana is divided by gender. Male teachers had more negative beliefs than female teachers (Butakor *et al.* 2020).

1.2. Implementing SDG in teaching activities

Universities are taking steps to eradicate social issues through an effective teaching practice (Michael 2006; Freeman *et al.* 2014; Wilke, Straits 2001). Some effective teaching practices are field work, online courses, discussion, conventional methods, excursions, and field visits (Agirreazkuenaga 2019; Buil-Fabrega *et al.* 2019; Boeve-de Pauw *et al.* 2019; Ortega-Sánchez, Gómez-Trigueros 2019). The conventional teaching method involves giving a lecture, raising questions and answers and peer presentation methods. Education teachers widely used lectures for sustainable development (Anyolo *et al.* 2018; Wilke, Straits 2001). Project-based and project-oriented learnings were effective teaching and learning strategies for universities (Albareda-Tiana *et al.* 2019). Critical Scientific literacy enables one to navigate sustainable issues effectively (Hogan, O’Flaherty 2021). Other studies indicate that the universities are practising sustainability in education through academic courses, workshops, seminars and conferences (Smaniotto *et al.* 2020). Teachers in universities tend to apply sustainability during the conventional teaching practices, and it is not widely used in the universities (Straková, Cimermanová 2018). The study finds various teaching practices implemented in universities for education for sustainable development. The inspiration of the studies Anyolo *et al.* (2018), Wilke and Straits (2001) and Straková and Cimermanová (2018) induced the study to give specific importance to conventional practices for the education of sustainable development. Similarly, previous studies described similar teaching practices of field work, online courses, discussion, conventional methods, excursion and field visits widely followed in universities (Agirreazkuenaga 2019; Buil-Fabrega *et al.* 2019; Boeve-de Pauw *et al.* 2019; Ortega-Sánchez, Gómez-Trigueros 2019). A detailed description of individual studies is given below

Agirreazkuenaga (2019) mentions in the study that education was the important pillar for sustainable development. So, the study focused on measuring education experiences for sustainability from a teacher’s perspective. The study measured the aspects of teachers' deeper insights through qualitative research methods. The qualitative tools of the study were in-depth interviews conducted with respective teachers. Results indicate that the involvement of teaching staff, leadership and personal motivation, and school authorities' support made the program

successful in the respective universities. The study mentioned that many teaching staff are still unknown about the sustainable development goals in education.

Buil-Fabrega *et al.* (2019) discuss a challenge for teachers to find new teaching methods to make the students participate in sustainable development. So, the study raised a question. What teaching methods was better to accomplish ESD? To identify the best methods, the study evaluated quantitative research methods. Questionnaires were used as a tool to gather opinions from the samples. Findings indicate that active and reflexive learning through excursion helped the students to learn about sustainable development. In addition to these, the study found that women were actively engaged in the survey.

Boeve-de Pauw *et al.* (2019) discusses that excursions were teachers' common practices to provide education on sustainable development. So, the study focused on measuring the effect of excursion on sustainable development learning outcomes. These measurements were made in quantitative research methods. Questionnaires were utilized as a tool to measure the effect of variables. Findings of the study indicate that the excursion increased the sustainable development learning, but it failed to reach the goals of the organizer.

Ortega-Sánchez and Gómez-Trigueros (2019) mention that massive open online courses were widely used in Spain. The courses support implementing sustainable development in the teaching and learning process. But the implementation in education was the biggest constraint for the country. So, the objective focused on measuring the representations determined by gender and education. The findings of the study indicate that teachers had a positive attitude towards implementing sustainable development in online courses. Transferring the knowledge of teachers and students for education for sustainable development through information and communication technologies. In the study, the samples had an average age of 22 years; women were more and bachelors were highly participated in the research.

Hogan and O'Flaherty (2021) mention that education played a key role in enhancing knowledge on sustainable development. Though global challenges are rising, education considers being a supportive tool to build education for sustainable development. Science education gave a prospect in exploring sustainability through pedagogical approaches. So, the present study measures the teaching practices of education for sustainable development. These measurements were made with the help of an ethnographically informed research design; semi-structured interviews were

conducted among academicians and tutors. The study results indicate an association between science and society in science education.

So, there was a need to enhance the learners by developing critical scientific literacy. It helped the learners develop critical ideas to present in media and public debates regarding sustainability issues.

2. RESEARCH METHODOLOGY

The purpose of the section will be achieved by carrying out a study through extensive reading of existing studies and justifying the studies with the present study. In this section, the study will apply research design, determination of samples from the population, sample size, data collection, reliability, ethical considerations and statistical tools. A detailed description of research methodology elements is presented in the subsequent section.

2.1. Research design

The study measures the awareness and attitude of university teachers in numerical data. Such data will use specific statistical tools to answer the questions of who, how much, where, how many and how. The researcher tries to gather the data from university teachers in numerical form and analyze the data using statistical tools. So the nature of the study is the quantitative research design. A similar method has been widely used in the literature (Smaniotto *et al.* (2020); Alghamdi (2018); Sonetti *et al.* (2021); Alghamdi and El-Hassan (2020); Aye *et al.* (2019); Wahono and Chang (2019); Vernia Carrasco *et al.* (2020); Emilzoli and Ali (2021); Maidou *et al.* (2019); Naikoo (2017)). The primary advantage of quantitative research design is that it saves researchers time and resources. The researcher seems to present the data in numerical form by quantifying the numbers. Data collection through the method makes generalization possible to a great extent. Though the method depends on hypothesis testing, there is no need for intelligent work to prove the objective. Despite its popularity, it suffers from limitations due to difficulty investigating in-depth study of attitude and awareness of SDG for education. Though it is predefined, it neglects the researcher opinion on creativity and critical thinking.

The population refers to the complete persons who are involved in the organization. In other words, it represents the entire group who give information for the study (Banerjee, Chaudhury 2010). In this study, the population is university teachers in a public university in Malaysia, which has been used in the literature (Crosling *et al.* 2020). The total number of public university teachers are 33000 in Malaysia (Wan *et al.* 2015). Samples pick out a small proportion of the population

(Collis, Hussey 2014). So, this study picks out the samples from public universities in Malaysia. Such samples have recently been used to study the sustainability of University teachers in Malaysia (Hamdan *et al.* 2019).

2.2. Sampling technique

A sample represents how the researcher takes a small amount of data in empowering the research to a great extent (Kolb 2008; Saunders, Lewis 2012). Techniques are of two types, namely probability and non-probability sampling. Among two samplings, the study chooses non-probability sampling, considering the subset of convenience sampling. A similar selection of convenience sampling is fully described in (Alghamdi, El-Hassan 2020) was used because it is cheap, efficient and easy to implement in their studies.

Sample size: With the help of a sample size calculator, the study fixes the sample size and the total sample size is 333. All the samples are from the University of Malaysia, University of Putra Malaysia, University Malaya and University Teknologi Malaysia, University Kebangsaan Malaysia. The participation of samples from the universities are 150, 53, 53, 45 and 32, respectively. The study adopts quantitative research to derive the outcome for research concerns. The method considers as an effective method to resolve the research issues.

2.3. Data collection and analyses

Data collection refers to accumulating the respondents' opinions, fixing hypotheses, applying statistical tools, and deriving the outcome (Paradis *et al.* 2016). The study accumulates the data through a structured questionnaire (Appendix 1). It includes both open-ended and close-ended questions. Also, the instrument has Likert scale questions to measure the attitude and awareness of SDG. It is worth pointing out that some authors have used Likert scale questions in measuring attitude and awareness of sustainable development goals for education (Smaniotto *et al.* 2020; Aye *et al.* 2019; Naikoo 2017). In this study, the researcher contacts the consultancy to gather the respective contact number and mail ID of samples. The researcher communicated with the samples regarding the survey, a google form link was sent to the respective samples, and samples made voluntary participation in the survey. All the sample opinions are gathered in Google form, a

downloaded opinion in excel format, coded the opinion and transformed into SPSS software. With the help of software, this study incorporates statistical tools.

Types of data collection: There are two types of data collection: primary and secondary data. Primary data is of collecting the respondent's opinion for the first time. It should not be changed or altered at any point in time. It has a higher validity (Gratton, Jones 2010). Therefore, the study uses primary data sources to collect respondents' opinions through questionnaire. This method has been used in the literature (Emilzoli & Ali, 2021; Park et al., 2016; Maidou et al., 2019; Naikoo, 2017; Butakor et al., 2020; Alghamdi, 2018; Sonetti et al., 2021; Alghamdi & El-Hassan, 2020; Wahono & Chang, 2019; Vernia Carrasco, et al., 2020)

Data processing is one of the most important steps in processing the raw data (Cooper, Schindler 2011). The study downloads the raw data from Google form in excel format. Coding applies to transform the raw data from excel to SPSS to perform the statistical tools. SPSS provides the information in a valuable form, and the researcher represents the data in tables and charts. (Brotherton 2008). Similar software were performed in other studies (Emilzoli & Ali, 2021; Park et al., 2016; Maidou et al., 2019; Naikoo, 2017; Butakor et al., 2020; Alghamdi, 2018; Sonetti et al., 2021; Alghamdi & El-Hassan, 2020; Wahono & Chang, 2019; Vernia Carrasco, et al., 2020)

This study will utilize percentage analysis to assess the profile of University teachers. Descriptive statistics will measure the awareness and attitude of sustainable development goals. An Independent sample t-test will measure the differences between two group means. One-way Anova will evaluate the differences of more than two groups of means. A fuller description of the analysis presents in Chapter 3.

Reliability: It measures the constructs and states whether they are dependable (Heale and Twycross, 2015). The study assesses it with the help of Cronbach alpha, which is primarily used to test the internal consistency of the items. The Cronbach alpha evaluates it through SPSS, and the outcome presents below

Table 1. Reliability

Particulars	value
Cronbach alpha	0.887

Source: Author's calculation

The study gets the Cronbach alpha as 0.887, above minimum internal consistency. Thus, it suits the best one to measure Likert scale items' internal consistency relating to attitude and awareness of SDG (Butakor *et al.* 2020).

Ethical considerations: The researcher needs to look at ethics before carrying out the research process. Ethics may differ based on the nature of the subject. The study is keen on framing the questions that have not affected the respondents' dignity. Also, it did not harm either physically or psychologically. Besides, the researcher focuses more on confidently keeping the respondent's opinion. Also, it induces the respondents to make voluntary participation. The study in no way involuntarily makes the respondents participate in it. Finally, it respects the respondent's independence. Finally, the study addresses the principles already stated by Bell and Bryman (2007)

Questionnaire design: As per studies (Nwangwa, Igbogi n.d; Smaniotto *et al.* 2020), awareness of sustainable development goals was prepared in Likert scale. Questions relating to the attitude of SDG is backed up by the evidence (Jakob 2020), which supports the idea of the attitude of SDG for University teachers.

3. EMPIRICAL ANALYSIS

The section aims to statistically analyse the university teacher's opinions on respective statements. These statistical results are exhibited in the form of tables and graphs. Some of the statistical tools for the study are frequency distribution, descriptive statistics, independent sample t-test and exploratory factor analysis. Frequency distribution is applicable for a profile of respondents. The profile of respondents shows the various measurement categories (age, gender and education qualification) and the number of observations in each category (number of respondents). Descriptive statistics organize the variables, describing the association between the variables in a sample or population. The present study picks out mean from measures of central tendency and standard deviation from measures of dispersion. In the present study, male attitudes and awareness of sustainable development goals vary with females. Awareness of sustainable development goals varies with females. A detailed description of the analysis presents below.

3.1. Profile of respondents

Profile of University teachers is age, gender and education qualification. Age (n=83) gathers through open-ended questions. Gender and education qualification raises through close-ended questions. The age of teachers is 25-30 years, 31-35 years, 36-40 years, 41-45 years and 46 years and above. Gender is male and female. Education qualification of University teachers is Masters, PhD and post-doctorate. University teachers provide general information, and it has been tested through frequency distribution. The study presents the frequency distribution outcome in the form of graphs. The detailed description of frequency distribution presents below

Age: The age of respondents is sub-classified into one of five categories: 25-30 years, 31-35 years, 36-40 years, 41-45 years and 46 years and above. The table shows that most respondents are between 36-40 years of age. Other age categories are 31-35 years (18.1%), 41-45 years (12.0%), 46 years and above (13.3%) and 25-30 years (3.6%). So, it concludes that the University teachers have most respondents who are 36-40 years.

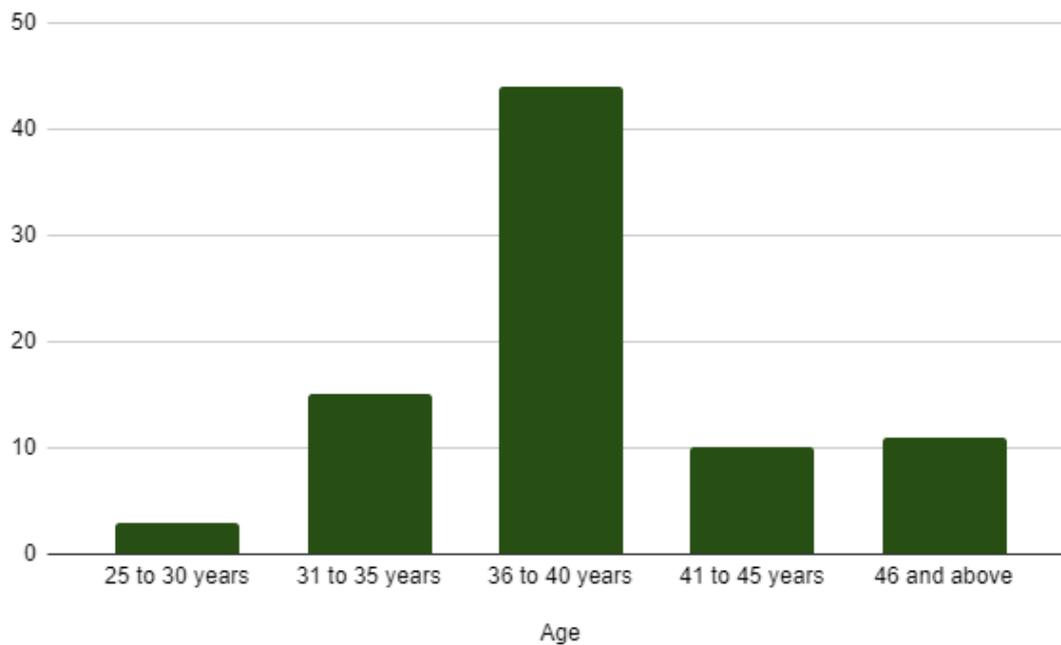


Figure 2. Age of respondents (n= 83)
Source: Author illustration

Gender: In this study, most university teachers are male (74.7%). At the same time, a relatively small number of female University teachers is actively participating in the study.

Education: University teachers and their respective education qualifications are Masters, PhD, and post-doctorate. The highest number of university teachers are doctorates (39.8%), and a relatively small percentage of respondents are masters (33.7%), and 26.5% are postgraduates. As observed from the survey, the maximum number of respondent's education qualifications is PhD.

Program: University teacher's respective teaching program is sub-classified into two categories: Undergraduates and Postgraduates. It observes from the survey that the majority of respondents are postgraduate teachers (98.8%), and a relatively lesser number of respondents are undergraduate teachers.

Major: The teaching major of university teachers are science and non-science. The highest number of respondents is a major science teacher (77.1%), and a small percentage of teachers are non-science majors (22.9%). So, it is clear that the maximum number of respondents are major science teachers.

Teacher’s awareness of sustainable development goals: All the University teachers are aware of sustainable development goals in the universities.

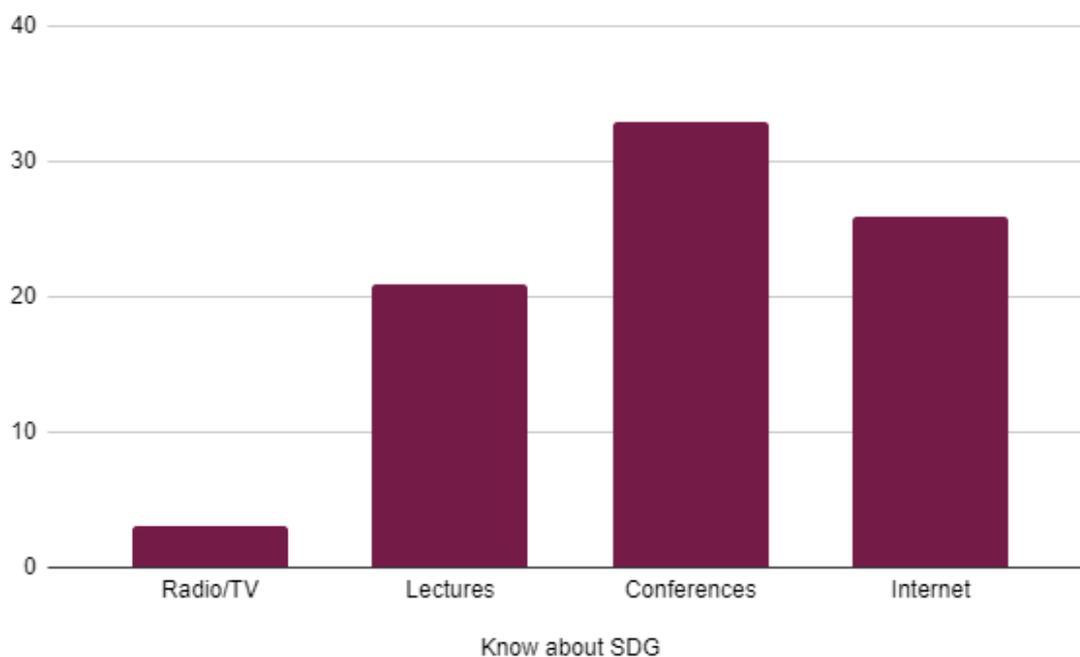


Figure 3. Sources of information
Source: Author illustration (n=83)

Sources of information: Various forms of university teachers come to know about sustainable development goals. Some of the forms taken in this study are radio/TV, lecturers, conferences and the internet. Most university teachers are acutely aware of sustainable development goals, notably in conferences and the internet. On the contrary, various sources create less awareness (radio/TV and lectures).

3.2. Mean and standard deviation

Awareness of SDG: The study measures the awareness of sustainable development goals in mean and standard deviation. The average awareness of sustainable development goals of university teachers’ values ranges from 1.7 to 2.1. The highest mean value is 2.1, indicating that the statement ‘University teachers attended webinars, conferences, and workshops to learn SDG’. The lowest mean value is 1.7, representing the statement ‘University teachers heard of Sustainable development goals. So, it observes that the highest mean value, the higher precision of awareness of sustainable development goals.

Standard deviation evaluates to know the accuracy of awareness of sustainable development goals. The average standard deviation values range between 0.80 and 0.95. The highest value of awareness of standard deviation is 0.95, indicating the statement ‘University teachers discussing sustainable development goals in the classes. The lowest value of awareness of standard deviation is 0.80, representing the statement ‘university teachers heard about Sustainable development goals. So, it observes that the lesser the mean value, the higher accuracy of awareness of sustainable development goals of university teachers.

Finally, the average awareness of university teachers is 1.89, indicating a low level of awareness found in University teachers.

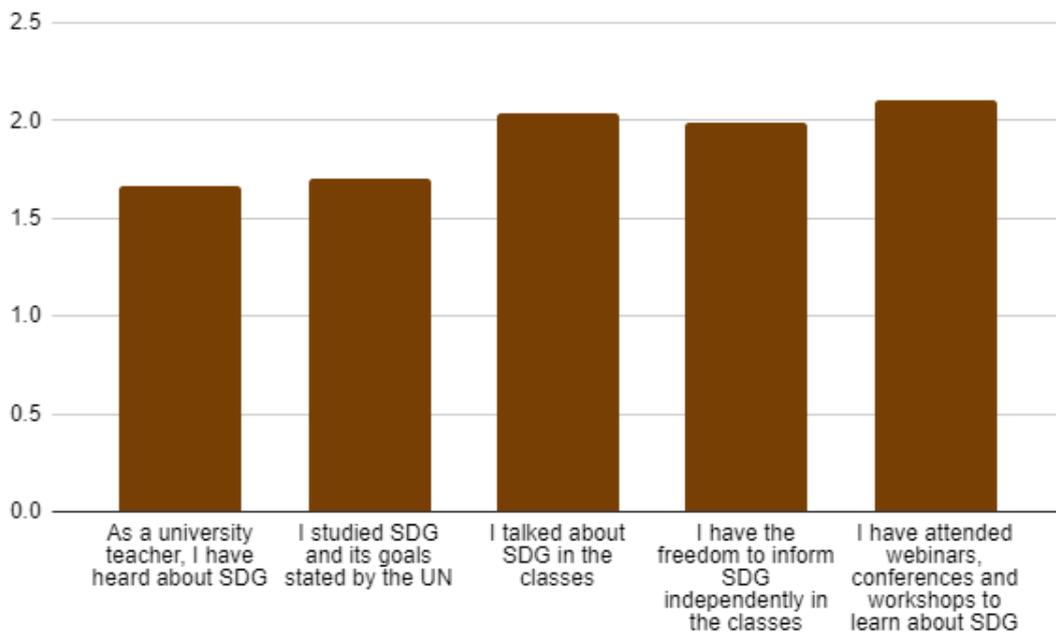


Figure 4. Awareness of SDG
Source: Author calculation (n= 83)

From the figure 4, it is clear that the highest mean value, the higher precision of awareness of sustainable development goals. In addition, it observes that the lesser the standard deviation value, the higher accuracy of awareness of sustainable development goals of university teachers.

The attitude of SDG: The study measures the attitude of sustainable development goals in mean and standard deviation. The values of mean and standard deviation describe the precision and

accuracy of the attitude of SDG of university teachers in Malaysia. The overall attitude of university teachers is 2.09, indicating a moderate level of attitude found in University teachers. The average attitude of sustainable development goals varies from 1.5 to 4.2. The highest mean value is 4.15, indicating the statement ‘University teachers’ did not take part in education for SDG’. Despite the highest value, the lowest value is 1.57 represents the statement ‘SDG will benefit the University teachers ability to teach students about sustainability’.

Standard deviation values represent the accuracy of the attitude toward sustainable development goals. The average standard deviation values range between 0.60 and 1.10. The highest value is 1.10, representing the statement ‘SDG education is the latest trend that will pass in time’. Despite the higher value, the lesser value is 0.60 indicating the statement ‘SDG will benefit the University teacher’s ability to teach students about sustainability’..

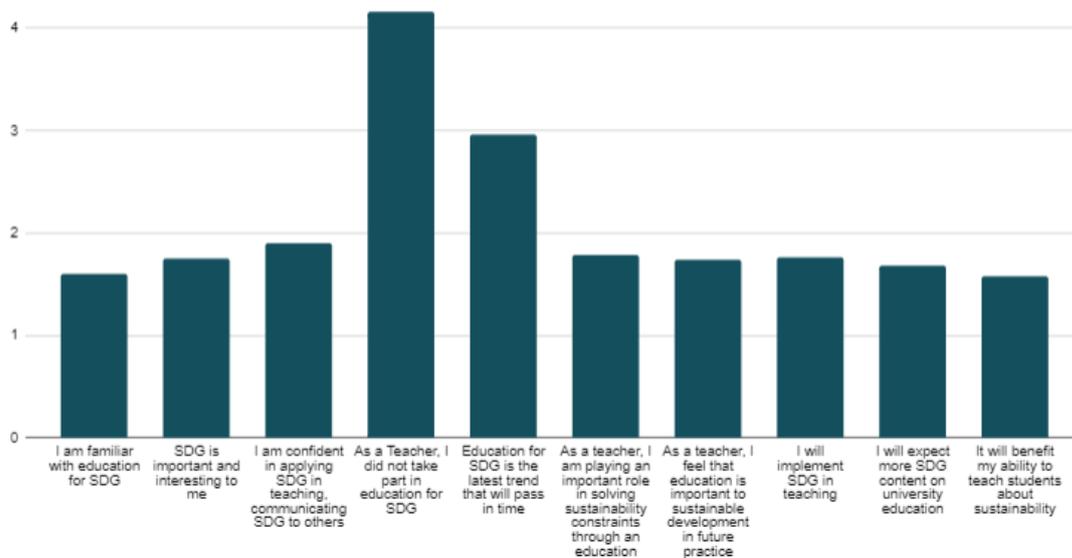


Figure 5. Attitude of SDG
Source: Author calculation (n= 83)

From the figure, it finds that the higher the mean value, the higher precision of attitude of sustainable development goals for the statement. The statement is University teacher’s s did not take part in education for SDG’. In addition, the lesser the standard deviation, the higher accuracy of the attitude of sustainable goals for the particular statement. SDG will benefit the University teacher’s ability to teach students about sustainability.

3.3. Difference of attitude and awareness of SDG among male and female respondents

Male university teachers Awareness of Sustainable development goals differs with female university teachers. The purpose of the section is to differentiate the University teacher's awareness of sustainable development goals in terms of gender. These differences are measures in the Independent sample t-test. Such test exhibits mean, standard deviation, t and p values. Mean values indicate the male university teacher's awareness (1.90), whereas female University teachers awareness is 1.88. This mean value represents the higher precision of awareness of sustainable development goals. This precision indicates a high awareness of SDG of male university teachers.

The accuracy of awareness differences of sustainable development goals is measured in standard deviation. These results reveal that the highest accuracy is found in female university teachers whereas lowest in male university teachers. With the help of standard deviation, this study observes that the accuracy of awareness is high in female university teachers.

The T-test value of SDG awareness in terms of gender is 0.096; the p-value is 0.923($P > 0.005$). These values indicate that no differences exist in awareness of the sustainable development goals of University teachers in Table 2. In addition to the outcome, the results are not statistically significant.

Table 2. Difference of attitude and awareness of SDG among male and female respondents

Particulars	Gender	mean	sd	t	p
Awareness	Male	1.9032	.73395	.096	.923
	Female	1.8857	.67401		
Attitude	Male	2.1306	.53480	1.106	.272
	Female	1.9857	.46828		

Source: Author calculation n=83

Male University teachers Attitude toward Sustainable development goals differs from female university teachers. The table shows the University teachers attitude toward sustainable development goals differs among the gender. These differences are measures in the Independent sample t-test. Such test exhibits mean, standard deviation, t and p values. Mean values indicate the male University teachers' attitude (2.13), whereas female University teachers awareness is 1.98. This mean value represents the higher precision highly prevails among male University teachers.

The accuracy of differences of the attitude of sustainable development goals measured in standard deviation. The outcome reveals that the highest accuracy is found in female university teachers, whereas the lowest is in male university teachers.

The t-test of an attitude of sustainable development goals indicates that the value of t is 1.106, and the p-value is 0.272, which is not statistically significant ($p > 5\%$). The study found that no differences exist in the attitude of sustainable development goals of University teachers, and it is not statistically significant.

3.4. Differences of Awareness of Sustainable Development Goals of Undergraduate and Post Graduate Teachers

The table shows the difference in awareness of sustainable development goals of university teachers in terms of the program. These difference measures in an independent sample t-test. Such test exhibits mean, standard deviation, t and p values. Mean values indicate the awareness of university teachers of the undergraduate program is 2.00 and 1.88 for postgraduate program. The highest precision finds in Undergraduate program university teachers. The detailed information of the t-test is presented in the following table.

Table 3. Difference of awareness of SDG among undergraduates and postgraduate respondents

Particulars	Program	mean	t	p
Awareness	Undergraduates	2.8000	1.272	.207
	Postgraduates	1.8878		

Source: Author calculation (n= 83)

The T-test value is 1.272; p-value is 0.207 ($P > 0.005$). These values indicate that undergraduate teacher's awareness do not differ from the postgraduate university teachers. In addition, the differences are not statistically significant.

3.5. Differences in an attitude of sustainable development goals of Undergraduate and post graduate teachers

The table shows the differences in the attitude of sustainable development goals of undergraduate and postgraduate teachers. Differences measures using independent sample t-test. These test exhibits mean, standard deviation, t and p values. The mean value of undergraduate teachers' attitude is 2.20, and post graduate teachers are 2.09. From the mean values, it is clear that the highest precision of attitude finds in undergraduate teachers. The result of the t-test indicates that the value of t is 0.204, and the p-value is 0.839, which is not statistically significant ($p > 5\%$). The study finds that undergraduate teachers' attitudes did not differ from postgraduate teachers.

Table 4. Difference of attitude of SDG among undergraduates and postgraduate respondents

Particulars	Program	mean	t	p
Attitude	Undergraduates	2.2000	.204	.839
	Postgraduates	2.0927		

Source: Author calculation (n= 83)

3.6. Difference of attitude and awareness of SDG among science and non-science respondents

In this section, the study measures the differences of attitude and awareness of SDG between science and non-science major university teachers. The difference measures in an Independent sample t-test. Such test exhibits mean, standard deviation, t and p values. The mean values of awareness of non-science teachers are 2.43 and 1.74 for science major teachers. The higher mean value and higher precision of awareness of sustainable development goals are found in non-science major university teachers.

The accuracy of differences of awareness of sustainable development goals is measured in standard deviation. The standard deviation results reveal that the accuracy is high in science major university teachers and less in non-science major teachers. Differences of awareness of sustainable development goals accuracy is high in science major teachers. T-test value is 4.026; p-value is 0.000 ($P < 0.005$). These values indicate that science major teachers' awareness of sustainable

development goals differs from the non-science major teachers. In addition to the differences, the values are statistically significant.

Table 5. Difference of attitude and awareness of SDG among science and non-science respondents

Particulars	Major	mean	sd	t	p
Awareness	Science	1.7406	.57974	4.026	.000
	Non-science	2.4316	.87499		
Attitude	Science	1.9969	.43378	3.307	.001
	Non-science	2.4211	.65284		

Source: Author calculation, n=83

The differences between science and non-science major university teachers and their attitude toward sustainable development goals are measured in an independent sample t-test. These test exhibits mean, standard deviation, t and p values. Mean values indicate that the awareness of non-science major teachers is 2.42 and less in major science teachers (1.99). This mean value indicates that higher mean, higher precision of non-science major teachers.

The accuracy of differences of the attitude of sustainable development goals measured in standard deviation. It reveals that the accuracy is highest in science major teachers and less in non-science major teachers. Higher standard deviation, higher accuracy of science major university teachers.

The result of the t-test indicates that the value of t is 3.307, and the p-value is 0.001, which is statistically significant ($p < 5\%$). The study finds that the attitude of sustainable development goals of science major teachers differs from non-science major teachers.

3.7. Attitude and awareness of SDG differ based on the age of respondents

The study assesses the difference in attitude and awareness of SDG based on the age of respondents. The age of teachers is 25-30 years, 31-35 years, 36-40 years, 41-45 years and 46 years and above. The following table shows the awareness of sustainable development goals and the differentiation of awareness in terms of the age of respondents. Differences of awareness of sustainable development goals in terms of age measures in One-way ANOVA, including mean, standard deviation, F and p-values. The highest mean value indicates the age group of 31 to 35 years (2.13), implying the higher precision. In contrast, the least mean value shows the age group of 36 to 40 years (1.73), representing the lowest precision. So, the higher the mean value, the higher precision of awareness of sustainable development goals find in 31-35 years of age.

The standard deviation of the values represents the accuracy of differences of awareness in terms of the age of respondents. The highest accuracy finds in 36-40 years, whereas least in 25-30 years of age.

Table 6. Difference of awareness of SDG based on the age of respondents

Particulars		mean	sd	f	sig
Awareness	25 to 30 years	2.0667	.94516	1.262	.292
	31 to 35 years	2.1333	.80947		
	36 to 40 years	1.7364	.55367		
	41 to 45 years	2.0200	.94493		
	46 and above	2.0727	.84981		

Source: Author calculation (n= 83)

In addition to the precision and accuracy, F-statistics are 1.262, and the significance value is 0.292, greater than 5%, respectively. So, the result shows no differences in sustainable development goals in terms of the age of respondents. Moreover, the p-value is not statistically significant.

Next, the attitude of sustainable development goals and the differences of values in terms of age of respondents presents in the below table. One-way Anova uses to determine the differences and the values of mean, standard deviation, F and p-values mentioned below

Table 7. Difference of attitude of SDG based on the age of respondents

Particulars		mean	sd	f	sig
Attitude	25 to 30 years	1.7333	.58595	2.382	.059

	31 to 35 years	2.3533	.58538		
	36 to 40 years	1.9740	.43769		
	41 to 45 years	2.2800	.49621		
	46 and above	2.1495	.61739		

Source: Author calculation (n= 83)

The mean values for 31-35 years of age are 2.35, 2.28 for 41-45 years, 2.14 for 46 years and above, 1.97 for 36-40 years of age and 1.73 for 25-30 years. The highest value is 2.35 for 31-35 years of age and the least for 25-30 years. The higher the mean value, the higher the precision for the age category of 31-35.

The standard deviation shows the accuracy of differences in the attitude of teachers on sustainable development goals. The standard deviation for 25-30 years is 0.5859, 0.5853 for 31-35 years, 0.43 for 36-40 years of age, 0.49 for 41-45 years of age and 0.61 for 46 years and above. The higher the standard deviation, the least precision for 46 years and above. The lesser the standard deviation, the higher precision for 36-40 years of age.

From the table, F-statistics is 2.382, and the significance value is 0.059, greater than 5%. So, the results show no differences in the attitude of university teachers on sustainable development goals in terms of the age of respondents.

3.8. Differences of attitude and awareness of sustainable development goals in terms of education of university teachers

In this section, differences in attitude and awareness of sustainable development goals in terms of education of university teachers. The education qualification of university teachers is Masters, PhD and Post-doctorate. One-way Anova uses to determine the differences and the outcome of differences of attitude and awareness presents below.

Table 8 Difference of awareness of SDG based on the education of respondents

Particulars		mean	sd	f	sig
Awareness	Master	1.9500	.87029	.529	.591
	Phd	1.9455	.62304		
	Post doctorate	1.7636	.63736		

Source: Author calculation (n= 83)

From the table, the mean values of Master education are 1.95, 1.94 for PhD and 1.76 for post-doctorate. The highest mean value is 1.95 for master's education, and lesser is 1.76 for post graduate qualification. The higher the mean value, the higher precision in Master qualification. The lesser the mean value, the lesser precision in the post-doctorate qualification.

The standard deviation uses to reveal the accuracy of differences of awareness of sustainable development goals in terms of education. The standard deviation for master's education is 0.87, 0.62 for PhD and 0.63 for Post doctorate. The highest accuracy is 0.62, indicating a PhD and the lesser accuracy is 0.87 for Master education. So, the values indicate the higher standard deviation, lesser accuracy for PhD. Lesser standard deviation values, higher accuracy for master's education.

One-way Anova table shows the F-statistics is 0.529 and the significance value is 0.591, greater than 5%. So, the results show that the awareness of university teachers did not differ statistically in terms of the education of respondents.

Next, the following table shows the differences in the attitude of sustainable development goals in terms of education of respondents. These differences measure in one-way Anova shows mean, Standard deviation, F and P-value. The outcome of the table shows in below.

Table 9. Difference of attitude of SDG based on the education of respondents

Particulars		mean	sd	f	sig
Attitude	Master	2.0806	.63903	.313	.732
	Phd	2.1455	.50068		
	Post doctorate	2.0338	.37431		

Source: Author calculation (n= 83)

The mean values of Masters, PhD and post-doctorate are 2.08, 2.14 and 2.03, respectively. From these values, the highest mean value is 2.14, indicating a PhD degree. The least value is 2.03, representing post-doctorate degrees. So, it finds that the higher the mean value, the higher precision for a PhD degree.

Standard deviation values of Master, PhD and post-doctorate is 0.63, 0.50 and 0.37, respectively. The highest standard deviation value is 0.63, indicating master's education, and the least value is 0.37, representing post-doctorate education. It finds that the highest and least accuracy is posted doctorate education and master's education respectively.

The table shows that the F-statistics is 0.313, significance is 0.732, and the values are greater than the 5% significance level. So, the results show no differences in sustainable development goals did not differ statistically in terms of respondents' education.

3.9. Factor analysis

EFA is used to reduce the number of factors in SDG and which factors have the greatest impact and should remain in the model. Also, which factors have little or no impact and should be eliminated from the model, resulting in a model of the most important effective factors.

The KaiserMeyer-Olkin (KMO) and Bartlett’s tests confirm the data validity and sample consistency. This test is used to determine sample adequacy, and it must have a result greater than 0.5 to proceed with adequate factor analysis. The KMO test value is 0.893, and Bartlett’s Test of Sphericity value is 778.709, both of which are highly significant; this indicates that the probability is less than 0.05, indicating that the factor analysis is suitable for this study.

Table 10. KMO and Bartlett’s test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.893
Bartlett’s Test of Sphericity	Approx. Chi-Square	778.709
	df	105
	Sig.	.000

Source: Author calculation

Principal Components Analysis was used to derive the communalities from the table. In addition, the study produced a communalities table that shows how the extracted components explain how much diversity exists in the observed variable, inclusive education. Together with the ones that follow, this stage presents the extractable factors, their eigenvalues, the percentage of variation explained by each component, and the total variance of all extractable factors. The variance explained by all retrieved elements is characterized as a communality variable. The higher the degree of communality, the more reliable the indication. At a minimum, the average level of communality should be .70. The researcher found the average communality for the 15 variables analysed to be .69.

The total variance explained table indicates that these three factors account for 69% of the variability in SDG, with the first component accounting for 33.89%, the second factor accounting for 8.60%.

The screen plot figure indicates that the curve is nearly continuous after the three-factor onwards, which means that each subsequent factor accounts for smaller and smaller quantities of the overall variance. After the third factor, the curve is hit a steady plateau before the end.

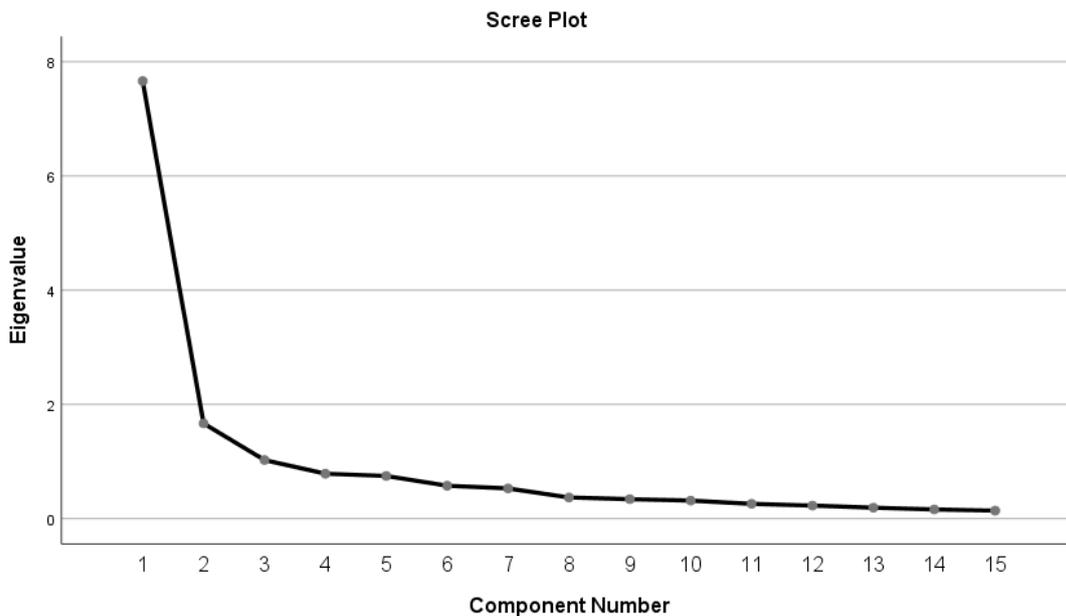


Figure 6. Screen plot
Source: Author calculation

The rotated component matrix shows the factor is classified into three factors. Each of the three-factor is labelled and explicitly states that factor loadings are greater than 0.50 is significant. 0.60 is highly significant, whereas 0.70 or above is considered extremely significant. The table below shows that the gap representing the factor loadings is less than 0.5, and the researcher surpassed the below 0.5 in the analysis.

The first factor is termed as an awareness of SDG, which implies such as hearing about SDG, goals stated by the UN, talking about SDG in the classes, freedom to inform SDG and attending webinars, conferences and workshops to learn about SDG with factor loading varied from 0.575 to 0.788. It is stated that the awareness of SDG is greater than 0.5, and represent the variables is significant.

The second factor is named as an attitude of SDG, which indicates the statement such as familiar, important and interesting, confident in applying SDG, did not take part in education, the latest trend that will pass in time, play an important role in solving sustainability constraints through education, education is important to sustainable development in future practice, implement SDG in teaching, expect more SDG content and benefit my ability to teach students about sustainability with the factor loading ranging from 0.60 to 0.863. It is found that the attitude of SDG is greater than 0.6 and indicates the attitude is highly significant. Lastly, the researcher concluded that the attitude and awareness of SDF are significant.

3.10. Discussion

This section summarizes the findings of the work. The demographic profile of teachers exhibited the information relating to age, gender, education qualification and major. In addition, awareness of sustainable development goals and the sources of information helped the university teachers to recognize the sustainable development goals. The survey results revealed that the highest number of teachers were between 36-40 years of age and male. A smaller number of female university teachers participated in this survey. Most of the teachers had education qualifications of doctorates. A lesser number of respondents were masters and postgraduates in the respective universities in Malaysia. In these universities, most teachers were teaching postgraduates to the students. These teachers came to know about the sustainable development goals through conferences and the internet. At the same time, less awareness was created through radio/TV and lectures. On the whole, most respondents were aware of sustainable development goals in the universities.

Next, the awareness and attitude of sustainable development goals of university teachers are evaluated in descriptive statistics. In these statistics, the mean and standard deviation was used.

1. Teachers' average value of awareness was between 1.7 and 2.1, indicating a low level of awareness was observed. Most teachers enriched the awareness through webinars, conferences, and workshops. The accuracy of sustainable development goals was between 0.80 and 0.95, indicating a low accuracy. Most university teachers' awareness gained the highest precision due to heard of sustainable development goals. To sum up the awareness, a low level of awareness was found in university teachers in Malaysia.
2. The attitude of sustainable development goals varied between 1.5 and 4.2, indicating a slight, moderate attitude found in University teachers. Most university teachers did not take part in education in sustainable development goals. The accuracy of the attitude of sustainable development goals ranges between 0.60 and 1.10, indicating a low accuracy of university teachers. Sustainable development goals benefitted the university teacher's ability in teaching students about sustainability. So, the overall attitude of university teachers in Malaysia was moderate.

Previously, the precision and accuracy of variables were measured. Next described the differences of awareness and attitude of sustainable development goals in terms of gender, programs and major.

First, differences of awareness and attitude of sustainable development goals in terms of the gender of University teachers were observed. The t-test values were not statistically significant. So, the values indicated that no differences exist in awareness of the sustainable development goals of University teachers. In addition to the outcome, the results were not statistically significant.

Second the differences of awareness and attitude of sustainable development in terms of the program. T-test values of awareness and attitude were not statistically significant. Hence, the results were undergraduate teachers' awareness and attitude did not differ from the postgraduate university teachers, and at the same time, the results were not statistically significant.

Third, differences of awareness and attitude of sustainable development in terms of major were observed. T-test values of awareness and attitude differ statistically. So, the outcome indicates that science major teachers' awareness and attitude toward sustainable development goals differs from those of non-science major teachers. In addition, the values were statistically significant.

After determining the differences of the two group means, one-way Anova was used to evaluate the differences of three group means.

First was the differences of awareness and attitude of sustainable development goals in terms of age of respondents. P-values of Anova was not statistically significant. So, there were no differences in awareness of sustainable development goals in terms of the age of respondents, and at the same time, it was not statistically significant. P-values were not statistically significant for the attitude of sustainable development goals. So, there were no differences in the attitude of university teachers on sustainable development goals in terms of the age of respondents.

The second was the differences in awareness and attitude of sustainable development goals in terms of respondents' education. The P-value of one-way Anova was not significant. So, the awareness of university teachers did not differ statistically in terms of the education of respondents. The P-value of attitude was not statistically significant. The values where no differences in sustainable development goals did not differ statistically regarding respondents' education.

Each aspect of the study is discussed in the findings. The study aim was to find out the attitude and awareness of university teachers towards implementing SDG in public universities in Malaysia. These aspects were measured in the quantitative research method. This is consistent with the methods of Smaniotto *et al.* (2020); Alghamdi (2018); Sonetti *et al.* (2021); Alghamdi and El-Hassan (2020); Aye *et al.* (2019); Wahono and Chang (2019); Vernia Carrasco *et al.* (2020); Emilzoli and Ali (2021); Maidou *et al.* (2019); Naikoo (2017), which suggest that it saved the time and resources of the researcher. The study population were the public university teachers in Malaysia. Samples were picked out convenience sampling method, and the respective samples of the study were university teachers from the selected universities in Malaysia. Alghamdi, El-Hassan 2020 reported a similar method in their experiments. Some of the selected universities were the University of Malaysia, University of Putra Malaysia. Universiti Malaya and Universiti Teknologi Malaysia, Universiti Kebangsaan Malaysia. Later determining the samples, this study utilised a questionnaire as a research instrument to gather the samples' opinions. Several authors have explored this as a potential option for gathering the opinion of the respondents (Emilzoli, Ali 2021; Park *et al.* 2016; Maidou *et al.* 2019; Naikoo 2017; Smaniotto *et al.* 2020; Alghamdi, 2018; Sonetti *et al.* 2021; Alghamdi, El-Hassan 2020; Aye *et al.* 2019; Wahono, Chang 2019; Vernia Carrasco *et al.* 2020).

A self-structured questionnaire is the best option in knowing awareness and attitude of sustainable development goals (Nwangwa, Igbogi n.d; Smaniotto *et al.* 2020; Jakob 2020).

Next, the study found the outcome for the stated research questions. First research question “What was the awareness of university teachers towards implementing sustainable development goals in public universities in Malaysia?” This study adopted descriptive statistics used in measuring the Likert scale questions. This method has been used previously by Smaniotto *et al.* (2020), Alghamdi (2018), and Vernia Carrasco *et al.* (2020). In this study, the awareness of sustainable development goals of University teachers was low (1.89). Such results agree with the results reported by Smaniotto *et al.* (2020) and Aye *et al.* (2019).

The second question is “What is the level of attitude of University teachers towards implementing SDG in Public universities in Malaysia?” The university teachers of the attitude toward sustainable development goals were moderate. This result is inconsistent with the previous studies by Emilzoli and Ali (2021); Maidou *et al.* (2019), Naikoo (2017); Vernia Carrasco *et al.* (2020) because the level was high in the respective studies.

Third, the specific question ‘Is university teachers’ awareness differs from the demographic profile of University teachers?’ was indicated. To determine the outcome for the question, the study adopted both independent sample t-test and one-way anova. These two statistical tools have been widely used in literature (Naikoo 2017; Butakor *et al.* 2020).

Fourth, the specific question ‘Does university teachers’ attitude differ from the demographic profile of University teachers’ was indicated. In this study, the outcome of differences of awareness and attitude of sustainable development goals in terms of gender and program of University teachers were not statistically significant. This is in contrast with the findings of Naikoo (2017).

At the same time, awareness and attitude of university teachers on sustainable development goals in terms of the age, education of respondents. Finally, one of the most surprising outcomes was that awareness and attitude of sustainable development goals in terms of major differed, and it was statistically significant. This result does not directly conform to the previous studies. So, the outcome of major statistical differences should be interpreted with caution.

CONCLUSION

Education is the central pole for sustainable development goals. Universities are the leaders because they can make social changes for the benefit of societies. They have the potential to extend support for sustainable development for education. But SDG in universities is still in infancy, and the low implementation of SDG is found in many universities in other countries. Malaysia is one of the leading countries that implement SDG in universities. But many studies found that the attitude of Malaysian university staff was positive, and at the same time, awareness was low. These contradictory opinions of studies influence the researcher to measure the attitude and awareness towards implementing SDG in Malaysia. The main aim of the study is to find out the attitude and awareness of university teachers towards implementing SDG in public universities in Malaysia. This study measured the aspects of quantitative research methods. Samples of the study are university teachers who pick out in convenience sampling method. Such samples acquire from five public universities. Some of the selected University of Malaysia, University of Putra Malaysia, University Malaya and University Technology Malaysia and University Kebangsaan Malaysia. After determining the samples, this study uses a self-structured questionnaire in gathering opinions from the respective samples. Statistical tools are utilised in measuring the awareness and attitude of sustainable development goals. The outcome reveals that the university teacher's awareness and attitude of SDG are low and moderate, respectively. University teachers' differences in awareness and attitude in terms of the demographic profile are not statistically significant for gender, program, age, and education. The science university teachers statistically differ from non-science major teachers. Finally, the study concludes that universities must take steps to enrich the knowledge of university teachers and successfully implement sustainable development goals in the public universities in Malaysia.

Implications: Training and awareness of teachers are essential in implementing the concepts through study programs of importance in knowledge and behaviour. Universities must incorporate sustainable development as a mandatory subject to teach values or activities related to SDG in universities. Teachers offer prospects to implement the concept effectively in their respective institutions. They need to develop their potential in teaching sustainable development goals to the students. To enrich the knowledge of university teachers, conducting conferences, seminars,

webinars, and faculty development programmes to educate sustainable development goals to the respective teachers. The universities should develop a pedagogical model to promote openness, knowledge, and sustainable values to the teachers. Such universities have a clear vision to ensure the implementation of sustainable development goals through curriculum and teaching approaches. Periodic training should be extended to teachers to equip them with sustainable development goals.

Limitations: The limitation of this work is that the study did consider the public university teachers in Malaysia. So, the outcome derived from this study does not apply to other private universities. In this study, limited variables like attitude and awareness were considered. In future work, it may be useful to study particular aspects of knowledge and behaviour of university teachers in Malaysia. A detailed study on sustainable development goals is necessary to recognise the importance of the aspects in the respective universities.

Scope for further research: The samples of university teachers are limited, so the findings may not apply to other private universities. The method currently considers only awareness and attitudes of sustainable development goals, and it is subject to further improvement. Knowledge and behaviour of sustainable development goals is still room for improvement. At present quantitative research methods are applied, and the full potential of the approach has not been proven. So, it is also possible to refine by considering the qualitative research methods.

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APPENDICES

Appendix 1. Questionnaire

Profile of university teachers

1. Age

2. Gen

3. Education qualification

4. Program
 - a. Undergraduates
 - b. Postgraduates

5. Major
 - a. Science
 - b. Non-science

Awareness of SDG

6. Do you aware of SDG?
 - a. Yes
 - b. No

7. If yes, how do you come to know about SDG?
 - a. Radio/TV
 - b. Lectures
 - c. Conferences

d. Internet

8. As a university teacher, I have heard about SDG

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

9. I studied SDG and its goals stated by the UN

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

10. I talked about SDG in the classes

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

11. I have the freedom to inform SDG independently in the classes

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

12. I have attended webinars, conferences and workshops to learn about SDG

- a. Strongly agree
- b. Agree
- c. Neutral

- d. Disagree
- e. Strongly disagree

Attitude of SDG

13. I am familiar with education for SDG

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

14. SDG is important and interesting to me

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

15. I am confident in applying SDG in teaching, communicating SDG to others

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

16. As a Teacher, I did not take part in education for SDG

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

17. Education for SDG is the latest trend that will pass in time

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

18. As a teacher, I am playing an important role in solving sustainability constraints through an education

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

19. As a teacher, I feel that education is important to sustainable development in future practice

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

20. I will implement SDG in teaching

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

21. I will expect more SDG content on university education

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

22. It will benefit my ability to teach students about sustainability

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

Appendix 2. Results

Table 11. Communalities

Particulars	Extraction
Awareness1	.622
Awareness2	.747
Awareness3	.647
Awareness4	.618
Awareness5	.691
Attitude1	.820
Attitude2	.748
Attitude3	.718
Attitude4	.616
Attitude5	.706
Attitude6	.630
Attitude7	.754
Attitude8	.705
Attitude9	.672
Attitude10	.660
Overall	.690

Source: Author calculation

Table 12. Total variance explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	total	% of variance	cumulative %	total	% of variance	cumulative %
1	7.662	51.079	51.079	5.079	33.861	33.861
2	1.667	11.111	62.190	1.290	8.603	69.032
3	1.026	6.842	69.032			
4	.787	5.245	74.277			
5	.747	4.981	79.258			
6	.575	3.836	83.093			
7	.529	3.528	86.621			
8	.371	2.472	89.093			
9	.340	2.268	91.361			
10	.316	2.106	93.467			
11	.259	1.725	95.192			
12	.228	1.523	96.715			
13	.192	1.282	97.997			
14	.160	1.069	99.066			
15	.140	.934	100.000			

Source: Author calculation

Table 13. Rotated component matrix

Particulars	Component	
	1	2
Awareness1	.788	
Awareness2	.748	
Awareness3	.575	
Awareness4	.703	
Awareness5	.683	
Attitude1		.863
Attitude2		.740
Attitude3		.600
Attitude4		.746
Attitude5		.797
Attitude6		.651
Attitude7		.764
Attitude8		.783
Attitude9		.817
Attitude10		.798

Source: Author calculation

Table 14. Demographic profile of respondents

Particulars		frequency	per cent
Age	25 to 30 years	3	3.6
	31 to 35 years	15	18.1
	36 to 40 years	44	53.0
	41 to 45 years	10	12.0
	46 and above	11	13.3
Gender	Male	62	74.7
	Female	21	25.3
Education qualification	Master	28	33.7
	PhD	33	39.8
	Post doctorate	22	26.5
Program	Undergraduates	1	1.2
	Postgraduates	82	98.8
Major	Science	64	77.1
	Non-science	19	22.9
Aware about SDG	Yes	80	96.4
	No	3	3.6
Know about SDG	Radio/TV	3	3.6
	Lectures	21	25.3
	Conferences	33	39.8
	Internet	26	31.3
Total		83	100.0

Source: Own calculation

Table 15. Awareness of SDG

Particulars	mean	sd
As a university teacher, I have heard about SDG	1.6627	.80057
I studied SDG and its goals stated by the UN	1.6988	.80751
I talked about SDG in the classes	2.0361	.95567
I have the freedom to inform SDG independently in the classes	1.9880	.93043
I have attended webinars, conferences and workshops to learn about SDG	2.1084	.98788
Overall	1.8988	0.8964

Source: Own calculation

Table 16. Attitude of SDG

Particulars	mean	sd
I am familiar with education for SDG	1.6024	.85454
SDG is important and interesting to me	1.7470	.82408
I am confident in applying SDG in teaching, communicating SDG to others	1.9036	.86411
As a Teacher, I did not take part in education for SDG	4.1566	.94329
Education for SDG is the latest trend that will pass in time	2.9639	1.10923
As a teacher, I am playing an important role in solving sustainability constraints through an education	1.7831	.85609
As a teacher, I feel that education is important to sustainable development in future practice	1.7439	.71683
I will implement SDG in teaching	1.7590	.74228
I will expect more SDG content on university education	1.6829	.62614
It will benefit my ability to teach students about sustainability	1.5732	.60920
Overall	2.0915	0.8145

Source: Own calculation

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ATTITUDE AND AWARENESS OF UNIVERSITY TEACHERS TOWARDS IMPLEMENTING SUSTAINABLE DEVELOPMENT GOALS IN PUBLIC UNIVERSITIES IN MALAYSIA

supervised by Merle Ojasoo, PhD

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