

Research Paper

# Assessment of Knowledge, Attitude and Practice of University Students towards Sustainable Development Goals (SDGs)

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## Abstract

This study was performed to determine the awareness level of University of Malaya students towards Sustainable Development Goals (SDGs). A set of survey questionnaires based on knowledge, attitude, and practice (KAP) was distributed among all the students of University of Malaya and 382 responses were obtained to analyze the awareness level (95% confidence level with  $\pm 5\%$  margin of error). Data analysis was performed SPSS Statistics version 20. Descriptive statistics showed that the respondents have high knowledge with a positive attitude towards SDGs. Spearman's rho coefficient correlation was applied to determine the relationships between variables (knowledge with practice and attitude with practice). The results revealed a weak negative correlation between the knowledge and practice towards SDGs ( $r = -.264$ ,  $N = 382$ ,  $p = .00$ ). However, there is a strong positive correlation between the attitude and practice towards SDGs ( $r = .440$ ,  $n = 382$ ,  $p = .00$ ).

**Keywords:** Environmental Sustainability, Sustainable Development Goals, University

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## 1. Introduction

In September 2015, the United Nations Summit on Sustainable Development in New York established a worldwide agenda for sustainable development until 2030 and defined a list of objectives on which to focus and achieve by the upcoming fifteen years. These objectives were later established as Sustainable Development Goals (SDGs), providing a shared blueprint for peace and prosperity for the people and the planet of today and future generations. It is also known as the 2030 agenda, with “no one left behind”. 193 countries agreed to move toward these goals. They agreed on setting 17 Sustainable Development Goals (SDGs), which is imperative to be adopted by all countries over the world immediately. Within the goals, 230 indicators and 169 targets were set to improve global conditions (“17 Sustainable Development Goals”, 2019). The goals are interconnected with each other, as achieving on one will accelerate the growth of tackling common issues within the goals. Here it is identified that eradicating poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and offshoot economic growth, while simultaneously tackling climate change and preserving oceans and forests (“Sustainable Development Goals”, n.d.). The SDGs are a striving step to bring the view of sustainability upon the people in places that have never been achieved before, yet implementation of the changes among the people is a major concern (Fleming et al., 2017). The enactment of the SDGs requires constant participation of all individuals.

Malaysia has stepped in the direction of sustainable development since the 1970s, when the New Economic Policy (NEP) was announced to reduce deprivation and balance social equity. In 2009, the country formulated the New Economic Model (NEM), whose initiatives mirrored the three elements (economic, social and environmental) of the 2030 agenda. Furthermore, they formed the Eleventh Malaysia Plan (11MP) with the vision of “Anchoring Growth on People” (“Malaysia Sustainable Development Goals Voluntary National review”, 2017). The vow to the 2030 Agenda for Sustainable Development has been aligned with the tactics and initiatives of the Eleventh Malaysia Plan. Therefore, sustainable development is not new to Malaysia. In fact, things have already been in motion on this path for decades. According to the Department of Statistics of Malaysia, the country is on the right track to achieve the goals (Sustainabledevelopment.un.org, 2019). Thus, it is necessary to involve the university students of the country to achieve the goals faster because they are the future leaders responsible for a sustainable planet (Joshi and Rahman, 2017; Asmuni et al., 2012).

Campuses of universities can be imagined as small towns, and it is possible to convert such spaces as habitats for the experimental enactment of a new social and technological paradigm that can work as a center point in managing sustainability (Ilham et al., 2018b). There are many initiatives that can be taken by the universities to bring the global agenda one step ahead. For instance, Kyoto University in Japan applied the simple idea of placing trash bins of recyclables near lecture rooms to grab the attention of every passers-by. By adopting this strategy, greater amounts of waste can be collected with less effort since cleaners do not need to enter each lecture room to collect the rubbish. Some universities in Malaysia have also installed motion sensors for restroom lights, which means that their lights are by default off unless someone enters the room, which is a great mode of energy consumption and CO<sub>2</sub> emission reduction (Ávila et al., 2017). These kinds of activities and approaches will involve students in practicing environment sustainability, while at the same time making them aware of its consequences (Ilham et al., 2019). The implementation of sustainability at universities can expand the potentials and horizons of students, both within and outside the campus territories (Trencher et al., 2014).

Therefore, it is rational to focus on the knowledge, attitude, and action of students towards SDGs. Knowledge is the insights of people about certain topics, such as SDGs. Attitude is then what they feel about SDGs and practice can be the results of their feelings and what they do about it (Kaliyaperumal, 2004). Numerous Knowledge, Attitude, and Practice (KAP) studies have been conducted to identify the awareness level of individuals on environmental sustainability, for instance studies on measuring the awareness level of SDGs on prospective elementary teachers (Borges, 2019), energy consumption (Paço & Lavrador, 2017), awareness levels of a university community in Southwestern Nigeria (Omisore, Babarinde et al. 2017), sustainable consumption among university students (Ahmad and Arifin, 2018), environmental knowledge, attitude, and practices of students and teachers (Esa, 2010), environmental awareness among secondary school students (Noordin et al., 2010), and others. According to Sybille (2011), these kinds of studies show not only characteristics of knowledge, attitude, and behaviors, but also the perceptions of each person on the content. This can be considered as an educational diagnosis

of a community (Kaliyaperumal, 2004.). Hence, KAP studies offer a way to measure the awareness levels of certain communities in an effective manner (Ahmad et al., 2015).

University of Malaya (UM) is the oldest public research university located in Kuala Lumpur, Malaysia, and currently aspires the way forward in sustainability agenda. In 2019, UM ranked 34th in the UI Green Metric World University rankings. However, no specific research has been found on the awareness level of SDGs among students of the University of Malaya ("UM living lab achievement report", 2019). Thus, this study attempts to provide information about the current position of students of the University of Malaya on the aspect of awareness on SDGs and intends to enlighten them about the 2030 agenda, which demands an urgent call for actions to sustain the world.

### 1.1. Reflections on Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) are a collection of 17 goals that have been endorsed by the United Nations (United Nations, 2015). These expansive targets are interrelated, but each needs their own focus to be achieved. The SDGs, as illustrated in Figure 1, cover a wide range of social and financial advancement issues such as poverty, education, climate change, environment, and others (Griggs et al., 2013). The SDGs, which are known as the 2030 Agenda, was created to supplant the Millennium Development Goals (MDGs) that ended in 2015 (Anger, 2010; Sachs, 2012). In fact, unlike MDGs, the SDGs do not differentiate between developed and developing nations, and they apply to all nations.



Figure 1: Sustainable Development Goals (2016-2030)

#### 1.1.1. Goal 1: No Poverty

Since 1990, poverty has been cut by more than half but more than 1 in 5 people still make a living with less than \$1.25 per day. That target may not be satisfactory for human subsistence, in any case. It may be essential to raise income figure to as high as \$5 per day (Fan & Polman, 2014). Poverty is more than the need for wages or assets. Individuals who live in poverty on the off-chance may need fundamental services such as healthcare and education. They also encounter starvation, social segregation, and prohibition from making choices. Sexual orientation imbalance plays an expansive part in propagating poverty and its dangers. Achievement of goal 1 is hampered by development disparity, progressively delicate statehood, and the impacts of climate change (Le Blanc, 2015).

#### 1.1.2. Goal 2: Zero Hunger

Globally, approximately 1 in 9 individuals are underfed, which is the larger part of individuals who live in developing countries (Fan & Polman, 2014). Agriculture is one of the biggest fields of employment in the world and is the major source of salaries for destitute family units of nine countries, giving jobs for 40% of the worldwide population. Women make up almost 43% of the agrarian labor in developing nations and over 50% in parts of Asia and Africa, and yet women only claim 20% of the land as being owned by them (Keesstra et al., 2016). The target of goal 2 is that by 2030 starvation and related health

ailments ought to end. This would be done by multiplying rural efficiency and livelihoods of small-scale nourishment producers, as well as guaranteeing feasible nourishment generation frameworks and continuously improving land and soil quality. Other targets bargain with maintaining genetic diversity as well as anticipating exchange limitations and changes in rural world markets to restrain extreme nourishment cost instability (Nilsson et al., 2016).

#### **1.1.3. Goal 3: Good Health and Well-Being**

Goal 3 is to accomplish widespread health coverage to incorporate fundamental medicines and vaccines. Critical strides have been made in expanding life expectancy and decreasing some of the common reasons for child and maternal mortality. Furthermore, advanced studies have been performed on clean water access and sanitation, as well as reducing jungle fever, tuberculosis, polio, and the spread of HIV/AIDS; however, only half of women in developing countries have obtained essential health care, and the need for family planning is expanding exponentially as the population increases. While needs are being tended to steadily, more than 225 million women have been neglected for contraception (Boerma et al., 2015). By 2030, this goal proposes the reduction of preventable death of infants and children below 5 years old, and scourges such as tuberculosis, intestinal sickness, and water-borne maladies by 2030 (Liu et al., 2016). In addition, health and well-being should be considered to incorporate targets related to the anticipation and treatment of substance abuse, deaths and injuries from traffic accidents, hazardous chemicals, greenhouse gas emissions, water pollution, and soil contamination (Schmidt et al., 2015; Tangcharoensathien et al., 2015).

#### **1.1.4. Goal 4: Quality Education**

Education, although easily and widely accessible, has only been achieved today specifically in primary schools. Access to education is not limited only to men; it is also open to women (Hajer et al., 2015). One realization is that this vast access is not a guarantee of the quality of education. Currently, it is estimated that over 60% of women of the total youth world population (103 million) still lack knowledge such as reading skills (Griggs et al., 2014). Hence, the primary objective for goal 4 is to promote balance between men and women, especially in obtaining free and most importantly quality education.

#### **1.1.5. Goal 5: Gender Equality**

Women in terms of their involvement in various sectors such as health, education, and politics can help a country generate a sustainable economic, societal, and humanitarian status. In 2014, it was recorded that a total of 143 countries pledged to secure the balance of engagement between men and women in their constitution (Nilsson et al., 2016). Among the issues that still persist among women is exploitation as sexual tools, forced marriages, and public views that degrade them. To achieve this goal, there is a need for legislation to protect women. It should also be remembered that the involvement of women is as agents of change rather than recipients of change (Sachs, 2012).

#### **1.1.6. Goal 6: Clean Water and Sanitation**

In 2017, records show that 4.5 billion people in the world still have not managed safe sanitation systems. Goal 6 has the aim of giving impetus to the importance of clean water use and environmental sanitation in everyday life. To that end, the parties involved have conceived many indicators for sanitation, such as toilets in schools and offices (Hák et al., 2016). This goal also emphasizes the cleanliness of water, specifically for drinking, and reduction of the open release of dirty water or sewage.

#### **1.1.7. Goal 7: Affordable and Clean Energy**

The target of SDGs is that at the end of its implementation period, access to affordable and sustainable energy use can be achieved entirely. The aim is to increase the production and use of renewable energy internationally (Lu et al., 2015). To achieve this, there is the need for holistic cooperation from all countries to facilitate access to this goal. If this goal is achieved, an economic spike and development will occur not only progressively but also sustainably.

#### **1.1.8. Goal 8: Decent Work and Economic Growth**

For Goal 8, it is estimated that at least 7% of the change in Gross Domestic Product (GDP) annually is to increase economic productivity in less-developed countries. Thus, the existence of agents such as innovation, entrepreneurship, and growth of small and medium-sized enterprises (SMEs) is essential for the success of this productivity. The target is divided into two periods, to 2020 and to 2030 (Griggs et al., 2013). By 2020, the target is that youth unemployment can be reduced by implementing a global strategy to create employment opportunities for youths. Meanwhile, for the year 2030, the target is providing sustainable tourism-related policies and to open new job opportunities. Furthermore, the strengthening of domestic financial institutions and increased trade assistance for developing countries is considered and referred to as a means of achieving sustainable economic growth (Griggs et al., 2014; Kellogg, 2017).

#### **1.1.9. Goal 9: Industry, Innovation and Infrastructure**

According to the sources, manufacturing-related industries are a major source of household income worldwide. Nevertheless, less-developed countries recorded a relatively low per-capita income rating (\$100) compared to developed countries in Europe and North America, which recorded a revenue value of \$4,621. For the record, the product manufacturing industry contributes the most (80%) to the total manufacturing output and 10% in less-developed countries in the industrial economy. In terms of infrastructure, this goal expects many facilities such as mobile cellular signals to be improved, especially in remote areas or less-developed countries (Lu et al., 2015; Kellogg, 2017).

#### **1.1.10. Goal 10: Reduced Inequalities**

Goal 10 has the target of reducing the cost of exporting goods from less-developed countries. In 2015, 65% of products exported from less-developed countries were tax-free, compared to 2005 (41%) (Griggs et al., 2013; Hajer et al., 2015). Meanwhile, in the case of transfers, the target for transfers is only 3% of the charge to migrant workers who send money to their respective countries. However, a 6% transfer charge is charged by some companies involved and 11% is imposed by commercial banks. Although there are services that charge between 2% to 4%, there are not many of these services (Nilsson, 2016).

#### **1.1.11. Goal 11: Sustainable Cities and Communities**

By 2030, this goal has the aim of wider access to safe and affordable housing. To achieve this target, the percentage of individuals living in slums or informal settlements is used as the measurement. By records, the percentage decreased from 39% (2000) to 30% (2014) (Griggs et al., 2013). Furthermore, some rural movements into urban areas have accelerated the process towards achieving this goal when better alternative housing is provided (Lu et al., 2015).

#### **1.1.12. Goal 12: Responsible Consumption and Production**

This goal encourages the usage of eco-friendly products and at the same time ensuring that waste generation is reduced. The goal targets increased participation in the recycling of materials and waste by 2030. In addition, companies should implement green practices and hence publishing their sustainable practice reports (United Nations, 2015).

#### **1.1.13. Goal 13: Climate Change**

In December 2015, the climate change issue was identified and discussed by the UN during the climate change conference in Paris. The report summarized that in order to tackle climate change, it is not impossible if the SDGs are being complied with. In addition, the climate issue is linked to a few factors such as poverty, gender equality, and energy. Hence, the UN proposed the public sector to instigate initiatives to reduce negative impacts on the environment (Lu et al., 2015).

#### **1.1.14. Goal 14: Life Below Water**

Oceans cover 71% of the earth's surface and contain more than 200,000 species that contribute as major sources of protein for the world. However, approximately 30% of marine habitats have been annihilated and 30% of marine life in the world is over-exploited. Oceanic contamination is even more stunning, as 15 tons of plastic are discharged into the seas directly each minute (Griggs et al., 2013). A few nations including Kenya and different communities around the world have prohibited the use of plastic for retail purchases. Progress in ocean improvement contributes to poverty diminishment of low-income families and sound nourishment (Anger, 2010). The target incorporates avoiding and decreasing marine contamination and destruction, ensuring marine and coastal environments, and managing fishing activity.

#### **1.1.15. Goal 15: Life on Land**

The main purpose of this goal is to protect biodiversity, including forest, desert, and mountain ecosystems, from further destruction. Accomplishing a "land degradation-neutral world" can be achieved by recovering corrupted forests and lost lands due to droughts and surges. This goal calls for more consideration to avoiding invasive species and protecting endangered wildlife. "The Mountain Green Cover Index" is utilized to monitor the restoration activity of biodiversity towards achieving the goal (Hák et al., 2016).

#### **1.1.16. Goal 16: Peace, Justice and Strong Institutions**

The target of this goal is to diminish savage crimes, sex trafficking, forced labor, and child abuse. The UN has recognized that more women became victimized in 2017. However, female victims had declined from 84% (2004) to 71% (2014). The major targets are to end sex trafficking, forced labor, and child abuse during the achievement of the goal, though achieving the goal might be challenging because of the dependence only on reported crimes (Kellog, 2017).

#### **1.1.17. Goal 17: Partnerships for the Goals**

The final goal (goal 17) was established due to problems that might arise in the implementation of the previous 16 goals. Hence, this goal was included to guarantee that nations and organizations cooperate instead of compete for the goals. Creating large stakeholder organizations to share information, expertise, innovation, and economy is seen as fundamental for the success of the SDGs (United Nations, 2015; Le Blanc, 2015).

A proper understanding on the 17 goals of the SDGs is paramount in this study in order to gauge the level of awareness among university students as the main respondents involved.

## **2. Methodology**

### **2.1. Sample Size and Method**

In this study, both online and paper-based survey were conducted among all students of the University of Malaya, both undergraduate and postgraduate students. First, the total number of enrolled students in UM was identified (UM fact sheet, 2019). Then, the minimum sample size (378 respondents) was set based on a simplified formula in the study of Yamane (Israel, 1992), and 382 respondents were obtained at 95% confidence level with  $\pm 5\%$  margin of error. The study was first decided to be conducted only by online survey to conserve the use of paper, but due to the lack of online respondents, both methods were applied. The online survey was distributed through SISWA mail (siswa.um.edu.my) which is the official e-mail application system provided to all students of University of Malaya and throughout all University of Malaya online groups. Paper-based questionnaires were distributed throughout the UM campus. The targeted areas were student residences, student lounge, library, and cafes. The responses were collected in a period of four weeks. The study was inferential, distribution was random, and responses were kept confidential.

## 2.2. Item Development

A knowledge, attitude, and practice (KAP) questionnaire (with a 5-point Likert scale) was designed by adopting the previous studies conducted by Ahmad and Arifin (2018), Borges (2019), and Omisore (2017). There were 5 sections in the questionnaire. Section A was about the demographic background of the respondents. Section B, C, and D involved knowledge, attitude, and practice towards the Sustainable Development Goals, while Section E involved respondent opinions. The overall number of items were adjusted accordingly after consequent validity and reliability tests were taken.

## 2.3. Item Validity and Reliability

Among several reliability test methods, Cronbach’s Alpha internal consistency method was employed for the analysis. From the conducted reliability test, all the variables of knowledge, attitude, and practice on SDGs had fair internal consistency, with the Cronbach alpha coefficient reported to be .905. The Cronbach alpha values for each variable were also reported to show good internal consistency under the satisfactory level of reliability, as presented in Table 1.

Table 1: Reliability test

Variables	No. of Items	Cronbach’s Alpha
Knowledge	10	.844
Attitude	14	.933
Practice	14	.741
Total	38	.905

## 2.4. Data Analysis

The awareness level of the students was measured by using descriptive analysis using the Statistical Package for the Social Sciences (SPSS) program. For inferential analysis, Spearman’s rho correlation coefficient was utilized to determine the relationships between variables (knowledge with practice, and attitude with practice). The data between knowledge and practice level was to be analyzed using rank-biserial, as the data was nominal (knowledge variable) and ordinal (practice level variable) (Chua., 2013) but Spearman’s coefficient was utilized instead (Glass., 1966). In order to measure the relationship between student attitudes and their practice level, Spearman’s coefficient was utilized as both variables are ordinal data (Chua., 2013). The correlation was significant at  $p < 0.01$ . Items that were negatively composed were recoded accordingly. The interpretation of the  $r$  value of Spearman’s rho correlation is stated in Table 2 to indicate the strength level of the relationship between the variables.

Table 2: Interpretation of Spearman’s rho correlation  $r$  value (Dancey and Reidy, 2004)

Spearman’s rho	Correlation
$\geq 0.70$	Very strong relationship
0.40-0.69	Strong relationship
0.30-0.39	Moderate relationship
0.20-0.29	Weak relationship
0.01-0.19	No or negligible relationship

\*This descriptor applies for both positive and negative relationships.

## 3. Results and Discussion

### 3.1 Sustainable Development Goals Adoption in Malaysia

#### 3.1.1 Ninth Malaysian Plan (9MP)

Malaysia through its Ninth Malaysian Plan (9MP) exposed the blueprint of government agenda for a period of five years (2006-2010). This comprehensive plan explained the distribution of budgets for various sectors (Saadatian et al., 2012). Furthermore, Malaysia always takes seriously sustainable development through the 9MP, and it was proven that Malaysia was ranked 38th among 146 nations and

second in Asia for its efforts in enforcing sustainable development. Next, Malaysia was ranked ninth among 133 countries based on the endeavors taken to diminish environmental impact on human well-being and for environmental assurance imperativeness (Foo, 2013). In Malaysia, there are many programs that have been planned by the government for environmental sustainability, but as for other countries, there are challenges in conserving the environment and especially in financial development. Hence, Malaysia recognized the sustainable development concept and implied the concept within policies, visions, missions, and plans. Moreover, Malaysia adapted Agenda 21 as part of the important factor for improving sustainable development implementation (Saadatian et al., 2009).

### **3.1.2 Malaysia National Vision Policy (NVP)**

The Malaysian National Vision Policy (NVP), which was proposed by the government for the years from 2001 to 2010, implemented the sustainable development concept. The policies related to sustainable development are encouraging more equitable society, sustaining economic development, and pursuing environmental protection. However, there were weaknesses in the implementation, even though Malaysia had made many plans related to sustainable development, where there is a lack of comprehensive engagement and insufficient indicators for sustainable development (Saadatian et al., 2012).

### **3.1.3 Malaysia Sustainable Assessment Approaches**

The importance of assessing sustainable development has been recognized by scholars and policy planners. Hence, some frameworks and mediums were created to conduct such an assessment.

### **3.1.4 Malaysia Quality of Life Index (MQLI)**

MQLI was developed by the Economic Planning Unit (EPU) under the Department of Prime Minister in 1999 as a tool to assess not only the life quality of Malaysians but also sustainable development approaches. It was then updated in 2004. MQLI assesses sustainable development through 14 practices, which are air quality, deforestation, water cleanliness, finance, working life, transportation and communication, well-being, education, housing, environment, family, social involvement, public condition, and culture with leisure (Hassan, 2017).

### **3.1.5 Malaysia Urban Quality of Life (MUQL)**

Another assessment, MUQL, was created in 2002 by the same department as MQL. MUQL, as with MQLI, focuses on the same approaches but particularly on Malaysians who live in urban areas. The assessment was expanded with extra rubrics such as urban service, solid waste generation, and river quality. This assessment implied the four themes of the air, water, land, and environment itself, including the inland and offshore (Saadatian et al., 2009; Saadatian et al., 2012).

### **3.1.6 Malaysia Urban Indicator Network (MURNINet)**

MURNINet focuses on urban development towards sustainable development, and this approach was developed by the Federal Municipality Council. This assessment contains 11 rubrics related to sustainable development, such as infrastructure, transport, environmental management, affordable housing, and others (Foo, 2013; Hassan, 2017).

### **3.1.7 Green Building Index (GBI)**

The Green Building Index (GBI) was created as an assessment approach for building construction. The approach targets to encourage developers, architects, and engineers in embedding sustainable activity during the building construction process. The main focus of GBI is on energy saving, recycling, climate-friendliness, and protection of the ecosystem, whether at local or global levels. GBI consists of six rubrics such as energy and water efficiency, indoor quality, sustainable planning, and others (Abidin, 2010).



All the policies and plans executed by the government of Malaysia as stated beforehand may have directly or indirectly affected communities, including university students in their knowledge, attitude, and practice towards the sustainable development goals.

**3.2 University students’ Knowledge, Attitude and Practice towards Sustainable Development Goals (SDGs)**

The majority of the respondents were female, with a percentage of 63.35%, and the remaining 36.65% were male respondents (Table 3). Most of the students had ages from 22 to 32 (59%) and 21 and under (35%). The majority of the students were undergraduate students (64.66%). The knowledge background of the respondents was divided according to sciences (60%) and non-sciences (40%).

Table 3: Demographic backgrounds

Variables		Percentage (%)
Gender	Male	36.65
	Female	63.35
Age	21 and under	35
	22 to 32	59
	33 to 43	5
	44 to 54	1
Education Level	Diploma	12.83
	Undergraduate	64.66
	Postgraduate	14.40
	Ph.D.	8.12
Faculty	Science	60
	Non-science	40

The level of knowledge of UM students is high (Table 4). Most of the students responded positively, ranging from 49.5% to 97.1%, highlighted with a grey color in Table 4. The highest percentage of positive responses (Yes) was for item K6 “Healthy oceans and seas are essential to our existence” with a percentage of 97.1%, which means that UM students possess good knowledge about oceans and water quality. One reason behind this could be that UM had taken the eco-campus initiative since 2016, by which several campus activities are conducted with the help of outputs from UM living laboratories that focus on minimizing harmful environmental impacts. In addition, the students and staff of UM are continuously updated with the achievements of eco-campus through e-mail and an official social media platform by which they acquire knowledge of water and oceans, climate change, and other essential news that requires promotion of sustainability (“UM eco campus” 2019). 95% of students were affirmative with the statement “The overuse of natural resources is affecting the well-being of future generations”, which is the gist of SDGs. Subsequently, when they were asked with statement K1 about their knowledge of “Sustainable Development Goals”, most of the respondents answered “Yes”, but unexpectedly, when they were asked if they knew that the goals are targeted to be achieved by 2030, the majority of the students did not know (50.5%).

Table 4: Percentages of student knowledge on Sustainable Development Goals

#	Items	Yes (%)	No (%)
K1	I have heard about the term "Sustainable Development Goals (SDGs)" before.	63.9	36.1
K2	I recognize that the meaning of the word "Sustainability" is the ability to be maintained at a certain rate or level.	92.1	7.9
K3	I am aware of the fact that Sustainable Development Goals are targeted to [be] achieve[d] by the year 2030.	49.5	50.5
K4	The overuse of natural resources is affecting the well-being of future generations.	95.0	5.0
K5	To achieve sustainable development, all people in the world must have access to a good education.	89.8	10.2
K6	Environmental protection, economic growth, and social equity are the fundamental element[s] of a nation.	96.9	3.1
K7	Healthy oceans and seas are essential to our existence.	97.1	2.9
K8	Increased use of renewable resources can reduce greenhouse gas emissions.	93.5	6.5
K9	Income inequality is a global problem that requires global solutions.	85.9	14.1
K10	Maintaining good relationship[s] with various countries is crucial to preserve peace around the world.	96.1	3.9

Table 5 represents the level of student attitudes toward SDGs. As the statements were positive and the negative statements were recoded accordingly, most of the respondents responded “Agree” or “Strongly Agree” to the statements. Both “Agree” and “Strongly Agree” responses are considered as positive attitudes, highlighted with a grey color in Table 5. The highest percentage of “Strongly Agree” responses by students was for statement A7, “Environmental problems are a matter of my concern” (56.5%). This indicates that the students of UM know the value of the environment and are aware of the consequences associated with environmental problems. The majority of the respondents also agreed with the fact that functioning and resilient infrastructure is the foundation of every successful community (52.6%). However, when they were asked whether basic environmental courses should be a part of a university curriculum, there were mixed responses, with 39.8% of students responding “Agree” and 24.1% of students responding “Neutral”. Yet overall, the respondents showed a positive attitude towards SDGs. Parallel results were also observed in studies such as those by Biassuti (2017), Gündüz (2017), Keles (2017), Al-Naqbi and Alshannag (2018), and Borges (2019).

**Table 5. Percentage of students’ attitudes on Sustainable Development Goals.**

#	Items	SD*(%)	D*(%)	N*(%)	A*(%)	SA*(%)
A1	Reducing poverty and hunger in the world are more important than increasing the economic welfare of the industrialized countries.	2.6	3.9	22.8	41.9	28.8
A2	To me, society should be provided with the best free basic health services.	2.9	3.1	10.7	38.2	45.0
A3	To me, raising awareness on Sustainable Development Goals among the university students is necessary.	5.8	8.9	14.7	36.6	34.0
A4	I feel basic environmental courses should be a part of our university curriculum.	3.9	4.2	24.1	39.8	28.0
A5	I think in society, males and females should be treated equally in all aspects of life.	3.1	6.8	15.7	34.3	40.1
A6	The rise of global temperature has increased water scarcity.	3.7	2.6	18.8	45.5	29.3
A7	Environmental problems are a matter of my concern.	4.5	6.5	8.1	24.3	56.5
A8	People from varying cultural backgrounds must be treated with the same respect.	3.7	2.1	10.7	30.4	53.1
A9	I try to conserve the use of electric energy at my place.	3.4	2.9	19.9	48.4	25.4
A10	I try to reduce the amount of waste at home by collecting materials that can be recycled.	3.9	6.3	29.6	41.1	19.1
A11	Functioning and resilient infrastructure is the foundation of every successful community.	2.1	3.1	22.5	52.6	19.6
A12	The government should take greater account of sustainability within their political decision.	2.6	1.3	10.7	47.1	38.2
A13	Research and educational institutions should take greater account of sustainability in their activities and campaigns.	2.6	1.6	8.1	45.3	42.4
A14	I believe that participation in a sustainable lifestyle will bring peace and justice globally.	3.9	1.6	14.1	41.9	38.5

\*SD= Strongly Disagree, \*D= Disagree, \*N= Neutral, \*A= Agree, \*SA= Strongly Agree

A different scenario was observed for the practice level of students (Table 6). The majority of the student criteria of practicing SDGs fell under “sometimes” and “often” as highlighted in Table 6. A large portion of students responded “sometimes” on statements such as P1, “I avoid using plastic straws at restaurants/cafes” (43.5%); P2, “I bring my own reusable bag for grocery shopping” (33.5%); P6, “I prefer public transport rather than a private one” (38.2%); and P11, “I am interested to pay more on environmentally friendly products” (39.5%). These are some of the crucial commitments people must make to achieve the goals, especially goal number 13 (climate action) which is the most urgent area of struggle among all other goals. If reusable bags are not used, the use of single-use plastic bags will keep increasing in the market and thus increasing the amount of non-degradable waste. Next, by using public transport, the amount of carbon footprint can be reduced; if not, global warming is likely to reach 1.5°C in the upcoming years (“The Sustainable Development Goals Report, 2019). As people face extreme weather changes, ocean acidification, sea level rise, catastrophes, and species extinctions, there is no alternative to using environmentally-friendly products. Furthermore, when they were asked whether they participate in environmental sustainability-related workshops or seminars, a majority of the students said they sometimes (28.8%) and rarely do (25.4%). On the contrary, 52.4% of students answered they always

conserve the use of electrical appliances at their home, 43.2% always turn off the air conditioner and lights of the classroom after the class finishes, and 40.3% are willing to utilize renewable energy, which are good attributes to reach the targets of goal 7 (affordable and clean energy) and goal 12 (responsible consumption and production). Nevertheless, integrated action is required to achieve all the goals. Therefore, it was shown overall that the practice level of students was slightly low. Similar results were also found by Ahamad and Arifin (2018) at the University of Putra Malaysia.

**Table 6. Percentage of student practice levels on Sustainable Development Goals.**

#	Items	N*(%)	R*(%)	S*(%)	O*(%)	A*(%)
P1	I avoid using plastic straws at restaurants/cafes.	4.7	12.8	43.5	25.1	13.9
P2	I bring my own reusable bag for grocery shopping.	11.0	17.3	33.5	24.9	13.4
P3	I discard recyclable material (ex: [as] plastic bottle, newspaper, glass) separately at home.	8.9	19.6	34.0	22.3	15.2
P4	I conserve the use of water supply at my place.	1.3	6.5	25.9	39.3	27.0
P5	I treat people from all caste, creed and religion equally.	1.0	3.4	16.5	31.2	47.9
P6	I prefer public transport rather than a private one.	3.7	10.7	38.2	26.2	21.2
P7	I switch off electrical appliances of my home that I don't need when I am not around.	0.3	3.4	14.4	29.6	52.4
P8	I turn off the air-conditioner and lights of the classroom after the class finish[es] and gets [is] empty at my university.	2.9	4.2	20.2	29.6	43.2
P9	I am willing to utilize renewable energy.	1.0	3.9	19.6	35.1	40.3
P10	I avoid using the animal skinned [animal skin] product.	3.4	8.1	14.9	24.3	49.2
P11	I am interested to pay more on environmentally friendly products.	3.1	12.0	39.5	26.2	19.1
P12	I have taken courses related to environmental sustainability.	23.6	17.5	18.8	18.8	21.2
P13	I participate in events (ex: [as] seminar, talk, workshop[s]) that relates [relate] to environmental sustainability.	14.1	25.4	28.8	20.4	11.3
P14	I talk about environmental sustainability with my friends and family.	7.1	17.8	35.9	24.1	15.2

\*N= Never, \*R= Rarely, \*S= Sometimes, \*O= Often, \*A= Always

**Table 7: Correlation between knowledge and practice and attitude and practice**

Correlation between	N	Spearman's rho correlation coefficient	Inference
Knowledge and practice	382	-.264**	correlated
Attitude and practice	382	.440**	correlated

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

There is a weak negative correlation between student knowledge and practice level towards SDGs ( $r = -.264$ ,  $N = 382$ ,  $p = .00$ ) (Table 7), which indicates that even though UM students have high knowledge about SDGs, their practice level is low. This proves that possession of great knowledge on the environment does not always translate into positive action (Mahat et al., 2017). The students may need to know how to use the resources rather than only having the knowledge about them in their head. Another study by Jamilah et al. (2011) also asserted that having high knowledge about SDGs failed to ensure a high level of practice among students. On the other hand, there was a significant strong positive correlation between

student attitude and practice level towards SDGs ( $r=.440$ ,  $n=382$ ,  $p=.00$ ) (Table 7) which indicates that a positive attitude towards SDGs will encourage them to have a good level of practice.

Cross-tabulation was done to monitor knowledge, attitude, and practice level in relation to multiple variables in detail. Cross-tabulation of average positive knowledge of students based on their gender showed that the knowledge of female students (87.89%) was higher compared to male students (82.65%). Likewise, female students possessed a higher positive attitude (78.35%) compared to male students (72.2%). The inclination of practicing SDGs was also higher among female students (56.38%) than male students (48.31%). Additionally, science students of UM possessed greater knowledge (science 85.8%, non-science 81.9%) and positive attitude (science 78.29%, non-science 68.84%) towards SDGs than non-science students. On the contrary, non-science students of UM possessed a slightly greater percentage for practicing SDGs than science students (science 53.3%, non-science 54.6%). This is unusual, because it is expected that science students would practice SDGs more because they are more familiar with nature preservation and science compared to non-science students.

The students were asked to state their opinion on which goal is of immediate concern to them; many of them stated goal 2 (zero hunger) and goal 4 (quality education). Students of UM are aware of the vulnerable consequences of malnutrition and food waste. Many activities of saving food are also held at UM, for example My Save Food and UM Food Bank among others. Moreover, since they are university students, they know the value of education, which can work as a catalyst to solve global problems. The results also showed that social media was the most preferred platform for them for obtaining environmental knowledge. Overall, most of the students commented that the implementation of SDGs will offer a beautiful world and a peaceful life.

#### 4. Conclusion

The overall awareness level of UM students toward SDGs is high, shown by a significant number of students who possess high knowledge with a positive attitude. Nonetheless, they showed slightly low performance in practicing SDGs. There is a weak negative correlation between student knowledge and practice level, which indicates that although UM students possess high knowledge about SDGs, their practice level is slightly lower, but this can be increased by strategic approaches and intervention programs by the university. However, there is a strong positive correlation between student attitude and practice level. This showed that by having a positive attitude, students will be more driven towards practicing actions aligned with SDGs. It should be noted that environmental approaches vary between institutions, and thus students may have different levels of awareness towards SDGs. On a positive note, several leading universities in the Asian region already started producing annual sustainability reports and this trend will hopefully soon lead to the introduction of sustainability policies. Therefore, future research could investigate deeper into the barriers of converting knowledge and attitude of SDGs into practices.

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#### References

- Asmuni S., Khalili J.M., Zain Z.M. 2012, Sustainable consumption practices of university students in Selangor, Malaysia. *J Asian Behav. Stud.*, 2 (6) (2012), pp. 73-82. Doi: 10.1016/j.sbspro.2012.03.078
- Ahamad, N. R., & Ariffin, M. (2018). Assessment of knowledge, attitude and practice towards sustainable consumption among university students in Selangor, Malaysia. *Sustainable Production and Consumption*, 16, 88-98. doi: Doi: 10.1016/j.spc.2018.06.006
- Ahmad, J., Noor, S. M., & Ismail, N. (2015). Investigating Students' Environmental Knowledge, Attitude, Practice and Communication. *Asian Social Science*, 11(16), 284.
- Al-Naqbi, A., & Alshannag, Q. (2018). The status of education for sustainable development and sustainability knowledge, attitudes, and behaviors of UAE university students. *International Journal of Sustainability in Higher Education*, 19(3), 566-588. Doi: 10.1108/IJSHE-06-2017-0091

- Ávila, L., Leal Filho, W., Brandli, L., Macgregor, C., Molthan-Hill, P., Özuyar, P., & Moreira, R. (2017). Barriers to innovation and sustainability at universities around the world. *Journal Of Cleaner Production*, 164, 1268-1278. doi: 10.1016/j.jclepro.2017.07.025
- Biasutti, M., & Frate, S. (2017). A validity and reliability study of the attitudes toward sustainable development scale. *Environmental Education Research*, 23(2), 214-230. Doi: 10.1080/13504622.2016.1146660
- Borges, F. (2019). Knowledge, Attitudes and Behaviours Concerning Sustainable Development: A Study among Prospective Elementary Teachers. *Higher Education Studies*, 9(2), 22. Doi: 10.5539/hesv9n2p22
- Chua, Y. P. (2013). *Mastering research statistics*. McGraw-Hill Education.
- Cohen, 2006 B. Cohen Urbanization in developing countries: current trends, future projections, and key challenges for sustainability *Technol. Soc.*, 28 (1–2) (2006), pp. 63-80.
- Dancey, C. and Reidy, J. (2004) *Statistics without Maths for Psychology: using SPSS for Windows*. Prentice Hall, London
- Esa, N. (2010). Environmental knowledge, attitude and practices of student teachers. *International Research In Geographical And Environmental Education*, 19(1), 39-50. doi: 10.1080/10382040903545534
- Etzkowitz, 2003 H. Etzkowitz Innovation in innovation: the triple helix of university-industry-government relations. *Soc. Sci. Inf.*, 42 (3) (2003), pp. 293-337.
- Fleming, A., M.Wise, R., Hansen, H. and Sams, L. (2017). The sustainable development goals: A case study. *Marine Policy*, [online] 86, pp.94-103. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X17304414> [Accessed 16 Sep. 2018].
- Gündüz, S. (2017). A Research about attitudes and behaviors of university students with having different cultures towards the environment through sustainable development. *EURASIA Journal of Mathematics Science and Technology Education*, 13(6), 1881-1892. Doi: 10.12973/eurasia.2017.01206a
- Geels, F.W. (2004) From sectoral systems of innovation to socio-technical systems: insights about dynamics and change from sociology and institutional theory. *Res. Policy*, 33 (6–7) (2004), pp. 897-920
- Glass, G. V. (1966). Note on rank biserial correlation. *Educational and Psychological Measurement*, 26, 623-631. Retrieved from here: <http://journals.sagepub.com/doi/pdf/10.1177/001316446602600307>
- Ilham, Z., Jamaludin, A.A., Zulkifli, N.E.I., Kamar. M.F., Zuki, F.M. & Jani, R. (2018a). Issues and challenges in organizing an effective campus energy saving culture, In: Yusoff, S. (ed) *UM Living Lab (Vol. 1)*. Sustainability Science Research Cluster, University of Malaya Press, pp. 39-47.
- Ilham, Z., Hakimi, M.I. & Khalid, N. (2018b). RCE Central Semenanjung: A study on local community sensitivity towards climate change risk events in Fraser's Hill, In: Yusoff, S. (ed) *UM Living Lab (Vol. 2)*. Sustainability Science Research Cluster, University of Malaya Press, pp. 116-127.
- Ilham, Z., Jamaludin A.A. & Hakimi, M.I. (2019). Youth for Environmental Sustainability (YES) Malaysia. In Hardiman, B. & Yuniarti, E. (Eds.), *1st Asia-Pacific RCE SDG Youth Challenge 2018 on "Youth for the Goals: Climate Action and Life Below Water"*, Western Sydney University Press, pp. 6.
- Israel, G. D. (1992). Gainesville: University of Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, EDIS, Determining sample size, pp. 1-5.
- Joshi Y., Rahman Z. (2017). Investigating the determinants of consumers' sustainable purchase behaviour. *Sustain. Prod. Consump.*, 10 (2017), pp. 110-120, Doi: 10.1016/j.kjss.2018.01.007
- Jamilah, H.A., Hasrina, M., Hamidah, A.H., Juliana, A.W., 2011. Pengetahuan, sikap dan amalan masyarakat Malaysia terhadap isu alam sekitar. *Akademika*, 81 (3), 103–115.
- Keles, Ö. (2017). Investigation of pre-service science teachers' attitudes towards sustainable environmental education. *Higher Education Studies*, 3(7), 171-180. Doi: 10.5539/hes.v7n3p171.
- Kaliyaperumal, K. Guideline for conducting a knowledge, attitude and practice (KAP) study. *AECS Illumination [Internet]*. 2004 [cited 2017 May 20]; 4 (1): 7-9.
- Malaysia Sustainable Development Goals Voluntary National review 2017. (2017). Retrieved from <https://sustainabledevelopment.un.org/content/documents/15881Malaysia.pdf>

- Mahat, H., Hashim, M., Nayan, N., Saleh, Y., Haron, S.M.S., 2017. Sustainable consumption practices of students through practice oriented approach of education for sustainable development. *Int. J. Acad. Res. Bus. Soc. Sci.*, 7 (6), 703–720. Doi: 10.6007/IJARBS/v7-i6/3031.
- Mont, O., Neuvonen, A., Lahteenoja, S., 2014. Sustainable lifestyles 2050: stakeholder visions, emerging practices and future research. *J. Cleaner Prod.* 63 (2014), 24–32. <http://dx.doi.org/10.1016/j.jclepro.2013.09.007>
- Noordin, T. A., & Sulaiman, S. (2010). The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students. *Procedia-Social and Behavioral Sciences*, 2(2), 1276-1280.
- Omisore, A. G., et al. (2017). "Awareness and Knowledge of the Sustainable Development Goals in a University Community in Southwestern Nigeria." *Ethiopian Journal of Health Sciences*, 27(6): 669-676.
- Paço, A., & Lavrador, T. (2017). Environmental knowledge and attitudes and behaviours towards energy consumption. *Journal Of Environmental Management*, 197, 384-392. doi: 10.1016/j.jenvman.2017.03.100
- Sustainabledevelopment.un.org. (2019). Malaysian Sustainable Development Knowledge Platform. Retrieved from <https://sustainabledevelopment.un.org/memberstates/malaysia>.
- Sustainable Development Goals. Retrieved from <https://sustainabledevelopment.un.org/?menu=1300>  
Section for Education for Sustainable Development (ED/PEQ/ESD) Division for the Promotion of Quality Education, UNESCO.[[http://portal.unesco.org/education/en/file\\_download.php/c087fbc95b175f1776b748036352e65fbrief+on+ESD.pdf](http://portal.unesco.org/education/en/file_download.php/c087fbc95b175f1776b748036352e65fbrief+on+ESD.pdf)] (2006, December 13).
- Saleh, A. A., Kamarulzaman, N., Hashim, H., Hashim, S. Z. 2011. An Approach to Facilities Management (FM) Practices in Higher Learning Institutions to Attain a Sustainable Campus (Case Study: University Technology Mara-UiTM). *Procedia Engineering*, Vol. 20, pp. 269-821 278
- Sybillie, G., 2011. The KAP survey model (knowledge, attitude and practices). Retrieved from [https://issuu.com/medecinsdumonde/docs/mdm\\_guide\\_kap\\_survey\\_2011](https://issuu.com/medecinsdumonde/docs/mdm_guide_kap_survey_2011).
- Trencher et al., 2014 G. Trencher, X. Bai, J. Evans, K. McCormick, M. Yarime University partnerships for co-designing and co-producing urban sustainability *Glob. Environ. Chang.*, 28 (2014), pp. 153-165
- The-Sustainable-Development-Goals-Report-2019.pdf Retrieved from <https://unstats.un.org/sdgs/report/2019/>
- UM fact sheet (2019). Retrieved from <https://www.um.edu.my/about-um/um-fact-sheet>. UM eco campus (2019). Retrieved from [https://www.google.com/search?q=UM+eco+campus&rlz=1C1CHBF\\_enMY793MY793&oq=UM+eco+campus+&aqs=chrome..69i57j0j69i60l2.3858j0j8&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=UM+eco+campus&rlz=1C1CHBF_enMY793MY793&oq=UM+eco+campus+&aqs=chrome..69i57j0j69i60l2.3858j0j8&sourceid=chrome&ie=UTF-8)
- UM living lab achievement report (2017-2018). Retrieved from [https://www.um.edu.my/docs/default-source/UM-Sustainability-Reports/um-campus-sustainability-report-2017-2018-\(um-living-labs-achievement-report\).pdf?sfvrsn](https://www.um.edu.my/docs/default-source/UM-Sustainability-Reports/um-campus-sustainability-report-2017-2018-(um-living-labs-achievement-report).pdf?sfvrsn)
- Wright, T., Horst, N., 2013. Exploring the ambiguity: what faculty leaders really think of sustainability in higher education. *Int. J. Sustain. Higher Educ.* 14 (2013), 209–227. <http://dx.doi.org/10.1108/14676371311312905>
- 17 Sustainable Development Goals. (2019). Retrieved from <https://www.eda.admin.ch/post2015/en/home/agenda-2030/die-17-ziele-fuer-eine-nachhaltige-entwicklung.html>