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Research paper

Investigating the Relationship of Sustainability Practices Dimensions Towards Green Campus Initiative in National Defence University of Malaysia

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Abstract

The aim of this study is to investigate the relationship between sustainability practices from corporate governance, students, staff, society, companies and continuous improvement dimensions, and environment dimension. A sample of 188 respondents from administration, selected faculties and centres of the National Defence University of Malaysia participated in responding to the survey of this study. Researchers used the Pearson correlation analysis from the Statistical Package for the Social Sciences software. Results found that there are significant relationships between corporate governance, students, staff, society, companies and continuous improvement, and environment. This study is the new finding to the current research gap, where hypothesis testing is used and may also contribute to the Higher Education Institutions, either local or international to make the instrument of this study as a part of the key performance index for the green campus initiative.

Keywords: *sustainability practices; green campus initiative; correlation*

1. Introduction

The initiative of green campus has attracted great attention from both the society and universities, and it is very meaningful to get a full understanding of the current status of green campus development in order to have a sustainable earth. Moving towards the green campus initiative, sustainability in terms of universities environment should be developed. Sustainability is crucial to higher learning institutions because they need to maintain their characters in the challenging globalisation. Universities need to be reconstructed as engaged social institutions that function as critical, reflective knowledge and capacity building centre for the next generation because they are the future leaders, innovators and problem solvers. Additionally, the issue of campus sustainability plays an important part in sustaining the position of best universities at higher level.

The campus sustainability movement emerged in the early 1990s and has since gone through two evolutionary waves. The first was focused on envisioning and articulating the need for campuses to incorporate all sorts of innovations to reduce the overall environmental impacts. The second is into the new millennium, where campuses around the world experimented with various green campus projects, and now there are few examples of almost everything on the green campus wish list. However, along the way, while universities were amassing project successes in a piecemeal fashion, they were not achieving the kind of deep organisational transformation towards sustainability [1]. Researchers found many literatures which discuss on the dimensions in sustainable development and sustainability practices in the Malaysian Higher Education Institutions, such as [2], [3], [4], [4], [5], [6], [7], [8], [9], [10] and [11]. However, previous literatures also highlight on the conceptual framework, but limited in terms of the empirical evidences. Thus, the aim of this study is to investigate the relationship between sustainability practices from corporate governance, students, staff, society, companies and continuous improvement dimensions, and environment dimension. This study may also contribute to the development of sustainability practices of the key performance index for the green campus initiative.

2. literature review

[1] have identified nine dimensions in sustainability practices for the National Defence University of Malaysia; corporate governance, students, staff, society, environment, companies, health and well-being, economic and wealth, and continuous improvement. Corporate governance is a system through which business companies are managed and controlled. According to [12], the structure of corporate governance defines the division of rights and duties between the individual stakeholders in a company and lays down the detailed rules and procedures for the decision-making on business matters of the company. Integrated with sustainability, which is defined as corporate strategy, long-term corporate goals are followed by effectiveness, performance and competitiveness by the means of incorporating the economic, environmental and social aspects into corporate governance. Therefore, the following hypothesis is developed by researchers to investigate the relationship between sustainability practices from corporate governance dimension and environment dimension:

H1: There is a significant relationship between sustainability practices from corporate governance dimension and environment dimension.

[13] mentioned that sustainability education is the education, which contributes effectively to a sustainable development of society, and acquires knowledge and insight about sustainable development. [4] found that the sustainability issues have been embedded in some of the courses' syllabus offered by faculties in UM, UKM, USM and UPM. On the other hand, [14] found that the highest mean in sustainability practices in students dimension is practices related to having a structured process to register the students' complaints in Spanish universities. Therefore, the following hypothesis is developed by researchers to investigate the relationship between the sustainability practices from students dimension and environment dimension:

H2: There is a significant relationship between the sustainability practices from students dimension and environment dimension.

[14] found that the highest mean in sustainability practices in staff dimension is focused on policies aimed at equal opportunities and professional careers. The university may offer recognition and reward incentives to staff to be involved in sustainable development and leadership in the regional community [15]. Therefore, the following hypothesis is developed by researchers to investigate the relationship between sustainability practices from staff dimension and environment dimension:

H3: There is a significant relationship between the sustainability practices from staff dimension and environment dimension.

[14] also found that the highest mean in sustainability practices in society dimension is developing cultural activities in Spanish Universities. [13] signified that there is still a considerable lack of awareness and there is a need to increase public sensitivity to the environment, and development problems and involvement in their solutions, as well as fostering a sense of personal environmental responsibility and greater motivation, and commitment towards a sustainable environment. Therefore, the following hypothesis is developed by researchers to investigate the relationship between sustainability practices from society dimension and environment dimension:

H4: There is a significant relationship between the sustainability practices from society dimension and environment dimension.

When the higher education institutions have good rapport with companies, where such companies have trainees or graduating opportunities, graduates have jobs in the companies and teachers have a part time job with the companies, it is considered as practicing sustainability [13]. [14] also found that the highest mean in sustainability practices in companies dimension is the creation of research networks between universities and companies to create, share and transfer knowledge to society, but the lowest mean is found in enhancing the quantity of ecological products bought from local suppliers in Spanish universities. Therefore, the following hypothesis is developed by researchers to investigate the relationship between the sustainability practices from companies dimension and environment dimension:

H5: There is a significant relationship between the sustainability practices from companies dimension and environment dimension.

[14] found that the highest mean in sustainability practices in continuous improvement dimension is the degree accreditation related to sustainability criteria, which is the most implemented practice, but the lowest mean is in assessing the responses of complaints regarding privacy and data protection in Spanish universities. Therefore, the following hypothesis is developed by researchers to investigate the relationship between the sustainability practices from continuous dimension and environment dimension:

H6: There is a significant relationship between the sustainability practices in continuous improvement dimension and environment dimension.

Fig. 1. illustrates the conceptual framework of this study. This conceptual framework is developed according to the previous literatures. Researchers identified six independent variables of sustainability practices dimensions, such as corporate governance, students, staff, society, companies and continuous improvement associated with the dependent variable, which refers to environment dimension towards the green campus initiative, consistent with the developed hypotheses.

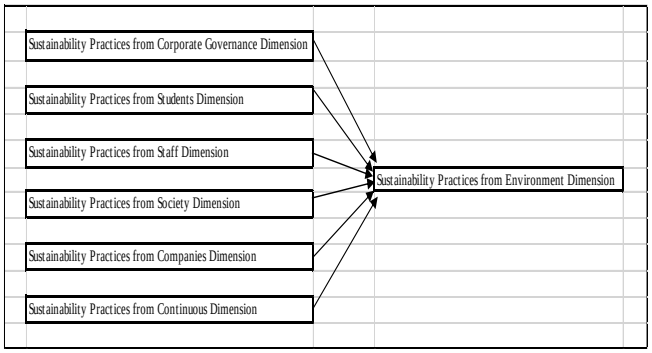

Fig. 1. Conceptual Framework

3. methodology

3.1. Research Design

Hypothesis testing is used as a research design in this study. It explains the relationship between independent variables, such as corporate governance, students, staff, society, companies, continuous improvement and the dependent variable, which refers to the environment. Researchers used the Pearson Correlation Analysis to answer the stated hypotheses in literature review. The cross-sectional studies have also been adopted in this study. Researchers collected the data from November 2017 to April 2018.

3.2. Instrument and Measurement

Researchers adopted and adapted the survey on sustainability practices in Spain by [14]. There are 8 parts in the survey with the Malay language translation. Part A is about the demographic of respondents, such as the types of respondent, either academic or non-academic; the gender, either male or female, and the age of respondents; within the range of more than 50 years old, 40 to 49 years old, 30 to 39 years old and 18 to 29 years old. TABLE 1 shows the measurement for the demographic variables.

Parts B until H are on the sustainability practices from corporate governance dimension, the sustainability practices from students dimension, the sustainability practices from staff dimension, the sustainability practices from society dimension, the sustainability practices from environment dimension, the sustainability practices from companies' dimension, and the sustainability practices from continuous improvement dimension. There are 12 items in each

dimension. Researchers used the five-likert scale to measure all items in each dimension as presented in TABLE I.

Table 1: Measurement Of Variable

Part	Variable	Measurement of Variable
A	Types of respondent	1 = Academic 2 = Non-Academic
	Gender	1 = Male, 2 = Female
	Age	1 = More than 50 years old 2 = 40 to 49 years old 3 = 30 to 39 years old 4 = 18 to 29 years old
B	Sustainability Practices from Corporate Governance Dimension	1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
	Sustainability Practices from Students Dimension	
	Sustainability Practices from Staff Dimension	
	Sustainability Practices from Society Dimension	
	Sustainability Practices from Environment Dimension	
	Sustainability Practices from Companies Dimension	
	Sustainability Practices from Continuous Dimension	

3.3. Data Collection Methods

As in part B of methodology, data in this study is a primary source. The researchers have personally administered the survey to collect data from selected faculties and centres in the National Defence University of Malaysia. The researchers agreed that this method of data collection is affordable to ensure cost effectiveness and responds to the respondents for any queries or doubts on items in the survey. About 200 surveys were distributed to selected respondents and 188 surveys were successfully collected with 12 surveys being rejected due to incomplete feedback.

3.4. Sampling

A sample of 188 respondents was selected from administration, such as the Deputy Vice Chancellor Office (Academic Affairs and Internationalisation), Deputy Vice Chancellor Office (Student Affairs and Alumni), Deputy Vice Chancellor Office (Research and Innovation), Bursar and Leadership, Corporate and International Affairs, selected faculties, such as the Faculty of Defence Studies and Management, Faculty of Engineering, Faculty of Defence Science and Technology, and selected centres, such as Centre for Quality Assurance and Data Management, and Centre for Entrepreneurship Development and Innovation. The selected respondents were selected as reconcile with the dimension in the survey. The number of respondents is sufficient for this study as according to [16], Population (N = 360), Sample (S = 186). Furthermore, the researchers used the G*Power 3.0.10 software to determine the total sample size [17]. The researchers also chose the exact test family, click on correlations: difference from constant (one sample case) as a statistical test, click a-priori: compute required sample size as a type of power analysis, and click two tails with the effect size r = 0.3 as a moderate correlation [18] for the input parameter. The researchers found that the required total sample size for this study was supposed to be 142, if the G*Power 3.0.10 software is used. Therefore, the number of sample is sufficient for this study.

3.5. Data Analysis

The researchers used the Statistical Package for the Social Sciences (SPSS) software for data analysis. As for the preliminary analysis, the researchers ran the frequency analysis to determine the demographic of respondents, the skewness analysis to determine the symmetry of data distribution, and the reliability analysis to determine the internal consistency of the items for each variable. The researchers then ran the Pearson correlation analysis to achieve the aims of this study.

4. results

TABLE II presents the demographic of respondents. There are 3 categories of respondent; types of respondent, gender and age. According to the types of respondent, respondents are mainly from non-academic staff (62.2%). The female respondents contributed a higher percentage (59%) for the gender category. According to the age category, the highest group of respondents is from 30 to 39 years old (50.5%), followed by the age from 18 to 29 years old (20.7%); the age from 40 to 49 years old (18.6%) and the age of more than 50 years old (10.1%).

As for preliminary analysis on this study, the researchers implemented the reliability and skewness tests. The researchers adopted the Cronbach Alpha to measure the internal consistency or reliability of items in each independent and dependent variable. TABLE III shows that the internal consistency of each variable is excellent and this is stated by [19]. The symmetry of the data distribution for all variables are normal distribution, where the statistics of skewness are within -1.96 to 1.96 and consistent with [20] Thus, all variables can be tested for parametric tests. The researchers then continued with the correlation analysis.

Table 2: demographic of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Types of respondent	Academic	71	37.8	37.8	37.8
	Non-Academic	117	62.2	62.2	100.0
	Total	188	100.0	100.0	
Gender	Male	77	41.0	41.0	41.0
	Female	111	59.0	59.0	100.0
	Total	188	100.0	100.0	
Age	More than 50	19	10.1	10.1	10.1
	40-49	35	18.6	18.6	28.7
	30-39	95	50.5	50.5	79.3
	18-29	39	20.7	20.7	100.0
	Total	188	100.0	100.0	

Table 3: reliability analysis

Sustainability Practices Dimension	Cronbach's Alpha	N of Items
Corporate Governance	.958	12
Students	.951	12
Staff	.948	12
Society	.950	12
Environment	.972	12
Companies	.955	12
Continuous Improvement	.959	12

Table IV presents the inter-correlations between independent variables (X1 Corporate Governance, X2 Students, X3 Staff, X4 Society, X5 Companies and X6 Continuous Improvement) and dependent variable (Y Environment). The correlation coefficient between independent variables and dependent variable is significant ($r = 0.672$, $p < 0.05$ for X1 and Y, $r = 0.682$, $p < 0.05$ for X2 and Y, $r = 0.771$, $p < 0.05$ for X3 and Y, $r = 0.659$, $p < 0.05$ for X4 and Y, $r = 0.758$, $p < 0.05$ for X5 and Y and $r = 0.798$, $p < 0.05$ for X6 and Y). The correlation coefficient suggests a very high correlation between X3, X5, X6 and Y, and a substantial correlation between X1, X2, X4 and Y [18]. These indicate that corporate governance, students, staff, society, companies and continuous improvement do engage in environment. Thus, all the hypotheses in this study are accepted:

H1: There is a significant relationship between the sustainability practices from corporate governance dimension and environment dimension.

H2: There is a significant relationship between the sustainability practices from students dimension and environment dimension.

H3: There is a significant relationship between the sustainability practices from staff dimension and environment dimension.

H4: There is a significant relationship between the sustainability practices from society dimension and environment dimension.

H5: There is a significant relationship between the sustainability practices from companies dimension and environment dimension.

H6: There is a significant relationship between the sustainability practices in continuous improvement dimension and environment dimension.

Table 4: Correlation Between Independent Variables And Dependent Variable

Correlations

		Corporate Governance (X1)	Students (X2)	Staff (X3)	Society (X4)	Companies (X5)	Continuous Improvement (X6)
Environment (Y)	Pearson Correlation	.672**	.682**	.771**	.659**	.758**	.792**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	188	188	188	188	188	188

5. discussion

The correlation between the sustainability practices from corporate governance dimension and environment dimension is in substantial correlation. This finding is consistent with [12]. It shows that there is a strong evidence that the university's corporate governance emphasises on the sustainable issue and thus it incorporates the green campus initiative, such as information technology and management support on paperless initiative [21], benchmarking with other universities on green campus campaign and go green campus.

The correlation between the sustainability practices from students dimension and environment dimension is also in substantial correlation. This finding is consistent with [13], [4] and [14]. It shows that the management of university deals with the academic and students' affair with green initiative implementation, such as notes delivery through e-learning system, cycling and walking campaign to class to reduce gas emission.

The correlation between the sustainability practices from staff dimension and environment dimension is also in high correlation. This finding is consistent with [14] and [15]. In this issue, all staff is encouraged to use email and university portal for research application, research status and leave application to reduce paper usage. However, from the researchers' observation, the notice on saving water and electricity consumption still needs to be improved from time to time.

The correlation between the sustainability practices from society dimension and environment dimension is also in substantial correlation. This finding is consistent with [14] and [13]. Researchers are in the opinion that the solidarity campaign on green campus initiative still needs to be improved tremendously by the management of university.

The correlation between the sustainability practices from companies dimension and environment dimension is also in high correlation. This finding is consistent with [13] and [14]. Practices related to transfer knowledge through collaboration and researches with other companies have to be improved for the green campus initiative.

The correlation between the sustainability practices from continuous improvement dimension and environment dimension is also in substantial correlation. This finding is consistent with [14]. Even though it is substantial correlation, through the researchers' observation, continuous improvement in submission of programmes accreditation should be through the e-system and future infrastructure must consider the green matters.

6. conclusion and recommendation

This study proves that in achieving the sustainability practices towards the green campus mission, six dimensions of sustainability practices from corporate governance dimension, students dimension, staff dimension, society dimension, companies dimension and continuous improvement have been identified and associated with the environment. This study is the new finding to the current research gap, where hypothesis testing has been used by researchers in this study. This study may also contribute to the Higher Education Institutions, either local or international to make the instrument in this study as a part of their key performance index for the green campus campaign.

The main obstacle in this study is to obtain feedback from the respondents. The researchers found that the duration of survey collection was too long; from distributing the survey to respondent to the survey collection, but with a dedicated research team, all surveys were successfully collected. The research could also explore other types of statistical tests, such as regression and MANOVA. More studies are needed on the other public Higher Education Institutions to prove the findings in this study. Other variables, such as total operating costs of the public Higher Education Institutions can be added as evidence of cost-benefit analysis towards the green campus initiative.

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