

EMPLOYEE ECOLOGICAL BEHAVIOR AS MEDIATOR IN THE EFFECT OF GREEN CULTURE ON EMPLOYEES' GREEN SATISFACTION

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Abstract: The topic of Employee Ecological Behaviour (EEB) is gaining the attention of academics and practitioners, specifically on factors influencing it and the outcomes it leads. Despite an increasing number of recent studies on various green management practices and the competitive advantage they offer, the number of studies on EEB among academic staff is currently limited. Due to this, this paper aims to assess the effect of Green Culture (GC) on Green Satisfaction (GS) through the mediation of the ecological behaviour of academic staff in Malaysian public research universities. The Social Exchange Theory (SET) describes the association between GC, GS, and EEB. This cross-sectional study investigates how GC affects the GS of academic staff through EEB in Malaysian public research universities. A total of 299 valid responses were gathered and analysed using Smart PLS. The findings prove that green culture influences green satisfaction through the full mediation of EEB. The present study only focuses on academic staff in local public research universities. For future works, it is suggested to consider other factors that could facilitate the relationship between GC and GS. Policymakers can use the findings to understand the importance of green practices and develop a robust pro-environmental policy. It is believed that no prior study has attempted to use EEB as a mediator between GC and GS.

Keywords: Employee ecological behaviour, low-carbon higher education institutions, environmental sustainability.

Introduction

An important issue that has been highlighted in various conferences worldwide, especially conferences held by universities, is environmental sustainability (Anthony Jnr, 2020). Due to the adverse effects of industrialisation activities on environmental sustainability, there is a dire need to mitigate environmental issues, including climate change. Since HEIs have a significant role in establishing an environmentally sustainable society (Stephens *et al.*, 2008), universities have been urged to incorporate the topic of sustainability in their research and academic programs and, at the same time to help increase awareness of environmental issues among the society (Geng *et al.*, 2013). In response, most HEIs have taken the initiative to implement sustainable development in the organisation, aiming to alleviate the negative

bearings towards the environment in their operations (Leal Filho *et al.*, 2019). Parallel to this commitment is CO₂ reduction for low-carbon HEIs and support for the move to a low-carbon economy by influencing environmentally friendly work behaviour.

One key factor in the transition to a sustainable society has low-carbon HEIs. According to Liu *et al.* (2017), to become a low-carbon campus, a university must have refined surroundings, cooperation, thoughtful management, and, most importantly, low emissions. However, the literature on low-carbon HEIs is not adequately integrated, with no clear concept (Liu *et al.*, 2017), and the term low-carbon HEIs in this context seems new. In this regard, it is clear that environmental sustainability is of great importance within a low-carbon HEI and that it is necessary to

gather the support of various staff members, particularly academic staff, for an initiative relating to environmental sustainability. Yuan and Zuo (2013) reiterated the significant short-term and long-term impacts of low-carbon HEIs on a society's low-carbon economy. Indirect impacts of low-carbon HEIs on sustainable development on campus and society include significant impacts on students' attitudes and knowledge development (Karpudewan *et al.*, 2009). Individuals' commitment to lessen their carbon emissions significantly impacts a community's comprehensive low carbon sustainability in relation to energy conservation and environmental protection (Jiang *et al.*, 2013).

Ignoring such a vital driver of change and initiatives in the low carbon HEIs can be a big catastrophe for Environmental Management System (EMS) implementation. This is because academic staffs comprise the apex of the HEI hierarchy. Their support would help achieve the environmental sustainability goal in the low-carbon HEIs and society. Employees' eco-friendly behaviours determine a firm's environmental management outcome since their behaviour can enhance their environmental performance (Daily *et al.*, 2009; Lo *et al.*, 2012). Furthermore, EEB is determined as the backbone of an effective EMS (Mazzi *et al.*, 2016), which actualises the role of HEIs low-carbon emission. Furthermore, HEIs have been designated as the incubator and propagators of green initiatives in society.

To students and society, academic staff are seen as mentors and pacesetters. These academic staff's adoption of environmentally friendly behaviour will cause a ripple effect, influencing students' attitudes and actions toward environmental sustainability, thus cascading into a low-carbon emissions society. As stated by Anwar *et al.* (2020), academic staff have a heavy influence on developing campus sustainability due to the knowledge and technical skills they possess, and the fact that they have direct top-to-bottom connections with universities, whether management or students. Hence, studying EEB

will greatly impact the body of knowledge for environmental management initiatives in low-carbon HEIs. In this context, the alignment of EEB is relevant to supporting low-carbon HEIs towards achieving environmental sustainability initiatives (Mazzi *et al.*, 2016). The success of environmental sustainability initiatives lies in the collaboration and cooperation of the employees, especially academic staff.

Background of Study

While EMS has been implemented in HEIs, studies have also shown that in its implementation, some bottlenecks exist (Saadatian *et al.*, 2009). The reasons are as follows:

1. There is a lack of cooperation among employees to align their behaviour with the EMS. Studies by several researchers have supported this claim (Aleixo *et al.*, 2016; Ávila *et al.*, 2017; Beynaghi *et al.*, 2015).
2. Academic staffs are not properly aware of these initiatives and have not emphasised their importance (Aleixo *et al.*, 2016).
3. Academic staffs believe their role does not extend towards being proactive about environmental management initiatives (Wals, 2014). Consequently, studies showed that HEIs staff, including academic staff, do not have the awareness and skills to practice proper environmentally friendly behaviour at work (Derahim *et al.*, 2012).

The Need for Study

In brief, this work aims to answer the main question: "Does EEB mediate the relationships between GC and GS?" In studying the association between these variables, the present work provides a fresh outlook on developing an EEB framework. The following statements justify the relevance of this study:

1. Previously, studies have been carried out on the associations between employee environmental attitude and employee environmental performance with the mediating effect of EEB (Tariq *et al.*, 2020); CSR and employee task performance (He

et al., 2020); knowledge and awareness on environmental issues and intention to engage in green practices (Chan, Hon, Chan, *et al.*, 2014). There is a need to study the relationship between GC and GS with the mediation of EEB.

2. Looking from the theoretical point of view, the available studies emphasised the significance of organisational culture to “sustainable development and environmental management”. Nevertheless, the experimental studies available on the association between organisational culture and GS are limited. A supportive GC must be adopted “where the entire organisation must reorient its attitudes and behaviours to be committed to achieving new goals” (Perron *et al.*, 2006). Several studies have found a relationship between organisational culture and environmental behaviour (Abadiyah *et al.*, 2020; Sabbir & Taufique, 2021; Yesiltas *et al.*, 2022). Hence, the current work explores whether and how green culture affects green satisfaction with the mediating role of EEB. To date, as far as we know, no prior attempt has been made to associate green culture and green satisfaction using EEB as a mediator among Malaysian academic staff.
3. Due to the limited research available on this topic, as an alternative, similar insight can be gained by referring to studies focusing on the effect of “Pro-Environmental Behaviour (PEB)” on attitude and investigating the impact of satisfaction on that relationship (Ertz & Sarigöllü, 2019). In their work, Kim *et al.* (2019) claimed that satisfied employees voluntarily engage in green initiatives and contribute to achieving sustainable organisational goals. In conclusion, it is theoretically possible that employees with high overall job satisfaction have consequences for work behaviours due to their desire to preserve a good feeling about their working conditions and their increased attention to their organisation’s environmental responsibility (Kim *et al.*, 2019).

The paper is structured into five sections where Section 2 presents the fundamental theory and lays out the proposed hypotheses; Section 3 explains the methodology used in this research; Section 4 presents the findings and analysis results; and lastly, Section 5 elaborates on the findings, suggests the managerial and practical implications, and concludes the study.

Theoretical Framework and Hypotheses Development

Underpinning Theory

The Social Exchange Theory (SET) might be useful for looking at environmental challenges. However, a minimal study has linked SET to ecologically sustainable behaviour (Craddock *et al.*, 2012). Blau (1964) defined SET as “the voluntary acts of persons motivated by the expected rewards they are supposed to bring and normally do bring from others.” According to Blau (1964), social support is a vital input for social interchange among those participating in a relationship.

The overview of available literature on culture highlighted that culture is vital in shaping one’s view and understanding of a particular topic (Spencer & Lilley, 2012; Kautish & Sharma, 2018). The literature also stresses that culture often pushes individuals to follow certain practices and behaviours (Gürlek, 2020). Specifically, when GC is upheld in an organisation, the organisation members will become more aware of the significance of protecting the environment and, thus, will be inspired to engage in EEB. Over time, they will experience GS due to their participation in pro-environmental activities.

In the present work, we aim to test a theoretical model demonstrating that GC is linked to GS through EEB, as depicted in Figure 1.



Figure 1: Hypothesised model

Green Culture and Employee Ecological Behavior

According to Lasrado and Zakaria (2020), an organisation's identity, culture, structure affect employees' attitudes and behaviours. Implementing a particular culture in a workplace motivates employees to behave according to the values represented by that culture (Gürlek & Tuna, 2018; Al-swidi *et al.*, 2021). For instance, if an organisation aims to adopt effective environmental management, a GC must be developed and green values must be shared among the organisation members (Ahmad, 2015; Galpin *et al.*, 2015). If the top management does a spectacular job in developing a well-rounded organisational culture, it would be easier for the organisation's members to accept the culture and show cooperation in promptly fulfilling their responsibilities (Dumont *et al.*, 2017). Once the employees absorb the GC and values, they will likely exhibit behaviours which contribute towards achieving green organisational goals, also known as Employee Ecological Behaviour (EEB) (Ones & Dilchert, 2012). Based on the findings by Lu *et al.* (2020), good moral and green values implemented by the organisation can influence employees' tendency to exhibit green behaviour. Various authors agreed that GC is positively linked with EEB (Pham *et al.*, 2018; Abadiyah *et al.*, 2020; Al-swidi *et al.*, 2021). Based on this theoretical background, it is hypothesised that:

H1: Green Culture has a positive relationship with Employee Ecological Behavior.

Employee Ecological Behavior and Green Satisfaction

When an organisation proposes values similar to the values adopted by the employees, this will instil positive effects on their behaviours

and attitudes (Ahmad & Umrani, 2019). In the context of GC, when green values are encouraged at the workplace, the employees with green consciousness are more likely to exhibit EEB and experience GS. GS has been described in a previous study as a positive emotional state that one experiences when their environmental needs are fulfilled (Amrutha & Geetha, 2021). When greening efforts are implemented at work, this improves their green behaviour and instils employees' sense of fulfilment from participating in these activities (Kim *et al.*, 2019; Amrutha & Geetha, 2021). Similarly, in a recent work by Amrutha and Geetha (2021), day-to-day green activities motivate employees to practice "reduce, reuse and recycle," resulting in GS. Hence, it is posited that:

H2: Employee Ecological Behavior has a positive relationship with Green Satisfaction.

The Mediating Role of Employee Ecological Behavior

Earlier studies indicated that employees are honoured to be connected with organisations with the reputation of being responsible (Farooq *et al.*, 2014; Ahmad *et al.*, 2018). For instance, when an organisation is involved in CSR practices and contributes towards improving the environment, the employees will be proud to be affiliated with that organisation. Furthermore, if the organisation and the employees share the same values, this will strengthen their association with the organisation and inspire them to engage in EEB. Additionally, the employees tend to contribute to achieving the organisational green goals when given incentives for their efforts. As established by the reciprocity norm of the SET (Blau, 1964), employees will respond with positive behaviours if they are provided with an advantage. In theory, implementing GC

at the workplace may evolve into GS through engagement in EEB. Nevertheless, no attempt has been made to test this idea. Therefore, to close the gap in the literature, this current study proposes that:

H3: Employee Ecological Behavior mediates the relationship between Green Culture and Green Satisfaction.

Method

Participants and Procedure

The data was collected during May–July 2021 through a self-administered survey. The participants were academics from five local public research universities. The five public research universities were chosen using a purposive sampling approach; they are Malaysia's first public universities with a long history and well-established EMS (Saadatian *et al.*, 2009). The examination of these public research institutions is required to determine their intellectual potential, with EMS serving as a model for other Malaysian universities (Sheriff and Abdullah, 2017). Convenience and snowball sampling methods were used in this study. The respondents were requested to complete the survey on EEB, green culture, and green satisfaction in HEIs. Malaysian HEIs provided the respondents with 650 questionnaires distributed online using the google doc questionnaire. In the end, 315 questionnaires were returned, of which sixteen were excluded from the statistical analysis owing to the multi-outliers detected. Overall, 299 questionnaires were acceptable to be analysed, representing a response rate of 94.92%.

Questionnaire and Measures

The questionnaire was designed in four sections focusing on a) GC; b) EEB; c) GS; and d) the respondents' general information, i.e., gender,

current university, higher level of education, appointment status, approximate length of service in the university, and monthly income. The constructs were measured by adapting previously validated scales from the literature. The first part of the questionnaire was designed to evaluate employees' perceptions of ecological behaviour adopted at their organisations using a seven-item scale developed by Wesselink *et al.* (2017). A sample item was "I switch off the lights when there is no one else in the office." The second part of the questionnaire focused on GC. This was measured using four items from Perron *et al.* (2006). A sample item was "Employees understand environmental issues". The four-item scale developed by Amrutha and Geetha, (2021) measured GS. A sample item was "I like the green work I currently do at this university".

Findings

Data Analysis

To assess the model, "Partial Least Squares (PLS) modelling" was utilised using the SmartPLS 3.3.3 version (Ringle *et al.*, 2015). As recommended by several authors (Kock & Lynn, 2012; Kock, 2015), "the full collinearity was tested" to tackle the Common Method Bias issue, which may arise when data collection is made through a single source. In this analysis, VIF less than 3.3 was recorded for EEB (1.081), GC (1.786), and GS (1.860), indicating no bias was detected.

Measurement Model

As proposed by Hair *et al.* (2022), we assessed the measurement model by observing "the loadings, Average Variance Extracted (AVE), and Composite Reliability (CR)". Since the loadings ≥ 0.6 , AVE values ≥ 0.5 , and CR values ≥ 0.7 , the information in Table 1 confirms our measures' reliability and convergent validity.

Table 1: Result of the measurement model

Constructs	Items	Loadings	AVE	CR
GC	GC1	0.880	0.797	0.940
	GC2	0.917		
	GC3	0.910		
	GC4	0.864		
GS	GS1	0.865	0.678	0.926
	GS2	0.864		
	GS3	0.847		
	GS4	0.786		
	GS5	0.860		
	GS6	0.708		
EEB	EEB4	0.974	0.526	0.815
	EEB5	0.658		
	EEB6	0.787		
	EEB7	0.649		

Note: EEB1, EEB2, and EEB3 were deleted due to low loadings

According to previous researchers (Franke & Sarstedt, 2019; Henseler *et al.*, 2015), the HTMT values should be ≤ 0.85 to confirm

discriminant validity. As seen in Table 2, all the HTMT values are lower than the cut off values of 0.85. Thus, the discriminant validity of the measures used in this study is confirmed.

Table 2: Discriminant validity (HTMT)

	EEB	GC	GS
EEB			
GC	0.213		
GS	0.315	0.723	

Table 3: Hypotheses testing

Hypotheses	Relationship	Std. Beta	Std. Dev.	t-value	p-value	BCILL	BCIUL	f2
H1	GC àEEB	0.190	0.054	3.493	0.00	0.095	0.265	0.037
H2	EEBàGS	0.273	0.053	5.104	0.00	0.169	0.341	0.08
H3	GCàEEBàGS	0.052	0.023	2.205	0.02	0.019	0.084	

Structural Model

The multivariate skewness and kurtosis were evaluated as Cain *et al.* (2017) recommended. Based on Mardia’s multivariate skewness ($\beta = 2.16, p < 0.01$) and Mardia’s multivariate kurtosis ($\beta = 14.991, p < 0.01$), the collected data were determined to be not multivariate normal. As

recommended by Hair *et al.* (2019), we reported: “the path coefficients, the standard errors, t-values, and p-values for the structural model using a 5,000- sample re-sample bootstrapping procedure” (Ramayah *et al.* 2018).

Our results specify that GC was positively related to EEB ($\beta = 0.190, p < 0.01$) and GS (β

= 0.273, $p < 0.05$), explaining R^2 was 0.010 ($Q^2 = 0.067$), which shows that this predictor explained 6.70% of the variance in EEB. Thus, H1 and H2 were supported (Table 3).

Next, we tested the mediating using the bootstrapping the indirect effect method (Preacher & Hayes, 2008). The mediation path of GCàEEBàGS ($\beta = 0.052$, $p > 0.05$)

was significant at the 0.05 level; thus H3 were supported.

Lastly, to check for predictive power, PLSpredict was performed as per the suggestion of Shmueli *et al.* (2019). Referring to Table 4, all of the PLS model's errors are lower than the LM, indicating that the predictive power of our model is strong.

Table 4: PLS-predict

MV	PLS		LM	PLS -LM			Q ² _predict
	RMSE	MAE	RMSE	MAE	RMSE	MAE	
GS1	1.378	1.137	1.214	0.949	0.164	0.188	0.260
GS2	1.563	1.224	1.282	0.969	0.281	0.255	0.363
GS3	1.425	1.124	1.280	0.954	0.145	0.170	0.227
GS4	1.638	1.282	1.404	1.056	0.234	0.226	0.298
GS5	1.546	1.240	1.191	0.924	0.355	0.316	0.440
GS6	1.190	0.924	1.042	0.785	0.148	0.139	0.259

Discussion

The results shown in Table 4 indicate that H1 is accepted where GC is positively related to EEB ($\beta = 0.190$, $p < 0.01$). The finding in this work mimics previous reports by Abadiyah *et al.* (2020) and Al-swidi *et al.* (2021), where GC influences EEB. It is apparent that when GC is implemented in the HEIs, academic staff who share the same green values as the university will engage in ecological behaviour. Not only that, academic staff will likely be more inclined to innovate (Matinaro & Liu, 2017; Shahzad *et al.*, 2017), perform better (Shahzad, 2014), and experience attitude change (Elkordy, 2013) when green values are embedded in the work setting. It is possible that if the staff had no interest in environmental issues, this could change towards the better when GC is introduced at work and made its way into their daily life.

According to Raineri & Paillé (2016), research on employee attitude that evaluates Employee Green Behaviour (EGB) and demonstrates the relationship between “co-worker support on Organisation Citizenship Behaviour Environmental (OCBE) through

job satisfaction” should be carried out. In the current study, a similar idea on job satisfaction is investigated and this supposition (H2) is corroborated when the results show that GC is positively related to GS ($\beta = 0.273$, $p < 0.05$) in Table 4. When academic staff participate in routine green activities due to the implemented GC, they might experience GS (Muster & Schrader, 2011) and become more aware of their behaviours outside the work setting (Pinzone *et al.*, 2019).

Using the bootstrapping indirect effect method (Preacher & Hayes, 2008), the mediation path of GC à EEB à GS ($\beta = 0.052$, $p > 0.05$) was determined to be significant at the 0.05 level. This validates the mediating effect of EEB in the relationships between GC and GS (H3). When a university strives to uphold the green culture and is reputable as a responsible organisation, the academic staff will feel proud to be identified with the organisation and will engage in EEB to assist in achieving the organisational goals. Consequently, the employees will gain satisfaction in their work for contributing to the environment and society.

Managerial and Practical Implications

Based on the presented discussion, the insights offered by this study are proven beneficial from both theoretical and managerial perspectives. This study addresses a gap in the environmental literature (Craddock *et al.*, 2012) by demonstrating that the social exchange paradigm is appropriate for analysing ecological behaviours in the workplace, utilising the tenets of SET. The findings of this study imply that studying the underlying mechanisms of green actions in the workplace using the social exchange paradigm might be an interesting alternative.

It is worth noting that this work serves as one of the earliest attempts to investigate the influence of GC on employees' GS through the mediation of EEB. Focusing on green behaviour among university academic staff is relevant in contributing to the literature on EMS and EEB. This is owing to the influence of top management of the HEIs in guiding the direction of a sustainable lifestyle on campus and in society. The current study serves as a gentle reminder to the academic staff of their role as role models in creating awareness of environmental issues.

The findings of the current work also offer insights for policymakers and top management regarding the importance of GC. These results suggest that policymakers in HEIs should create a GC that would lead to systems procedures and processes that would create an environmental consciousness. Even though this study was carried out at Malaysian HEIs, these findings are relevant to a broader audience. It is recommended that HEIs go green and develop a plan for their personnel to become environmental advocates. These cooperations will need to undertake EEB operations efficiently and successfully to enhance environmental management and foster workers' eco-friendly behaviour at work. Realising the significance of GC on GS, top management should clearly explain the end goal of implementing green activities to ensure that the employees know the organisation's mission of protecting the environment and achieving their work satisfaction.

Limitations and Future Research

Looking into the future, further work can be carried out by considering the limitations of this study. First, the present research focuses on the educational sector. Hence, the conclusion made in this work does not apply to other industries due to differences in finance and organisational structure. Second, this study uses "cross-sectional data collected at a single time point". In order to understand in-depth the dynamic of these relationships, a longitudinal methodology can be adopted to investigate detailed behaviour changes and establish causal relationships. Also, since this study applied a quantitative approach which offers restricted information, future research should consider a mixed methods approach to understand better the factors that affect green behaviour. Next, seeing as the study only collected data from employees related to academic staff in Malaysia, future research could explore traits in other similar developing economies. Finally, it is suggested that further research should use other variables such as green employee engagement, green employee empowerment, and GHRM better to understand the fundamental mechanism between EEB and GS.

Conclusion

The current work has contributed to the field of EEB in the context of HEIs. This research is unique as it establishes the link between GC, EEB, and GS all in one place. Finally, the outcomes of this study may provide valuable recommendations for top management when constructing a successful behaviour change intervention.

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