

## THE ENVIRONMENTAL PERFORMANCE IN AVIATION INDUSTRY- THE MODERATED MEDIATION MODEL OF ETHICAL LEADERSHIP

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### ABSTRACT

*Purpose* – This research creates a research model that emphasizes the moderating influence of ethical leadership (ELS) and the link between green training (ET) and employee environmental performance (EP) via green work engagement (GWE) in the aviation industry.

*Research methodology* – We used a time-lagged research design for our study. Data were gathered from 253 respondents working for aviation companies in Vietnam and analyzed by SmartPLS 4.0.

*Findings* – The findings show that ET has a beneficial effect on EP through GWE. Based on social exchange theory (SET), we discovered that ET increased EP, and that this favorable relationship was mediated via GWE.

*Research limitations* – The future studies should widen to other developing countries and other services.

*Practical implications* – We advised that green aviation companies provide ET to employees in order for them to obtain green knowledge and skills in order to alleviate environmental difficulties.

**KEYWORDS:** Environmental performance, aviation industry, Vietnam

### 1. Introduction

Based on social exchange theory (Cropanzano and Mitchell, 2005) and ethical leadership (Brown *et al.*, 2005), the goal of this research is to create a model that connects green training with EP through GWE. Furthermore, this article seeks to investigate the role of ELS as a moderator in ET and GWE linkages. ET is an important function of human resource management (HRM) that strives to increase worker comprehension of environmental implications while also providing them with key environmental abilities and expertise within the firm (Renwick *et al.*, 2013).

Environmental performance is defined as a business's promise to protect the natural environment and represents the number of activities that fall within prescribed environmental protection limits (Paillé *et al.*, 2014). According to Ciocirlan (2017), "workplace sustainability at the macro level begins with individual action" (p. 64). It is recognized that individual EP can contribute to the overall EP of a company (Pham *et al.*, 2020). Environmental assessments show that EP is considered in different ways depending on whether the focus is on the organization or

the employee line. Ones and Dilchert (2012) argue that this is more suitable to contribute to organisational employees and, more particularly, employee views of EP of an organisation, as workforce "will provide a more accurate picture of environmental performance" (p. 451). Personal environmental performance describes the extent to which individuals believe they perform green actions or gestures that are commensurate with their employer's expectations in supporting their environmental goals. EP is communicated through broad environmental behaviors (Ones & Dilchert, 2012). Focusing on employee opinions on EP is an attractive option because it allows them to illustrate their efforts to protect the environment at work (Nguyen *et al.*, 2023; Nguyen and Nguyen, 2024).

Green training and its environmental repercussions have long been examined by academics (Jabbour and Jabbour, 2016). According to Siyambalapatiya *et al.* (2018), environmental training programs are required to support ecologically beneficial behavior. However, according to SET, EP can be a crucial result of environmental training, but this is underappreciated by researchers, particularly in the aviation industry. Applying this to the green environment, the issue at hand is whether GWE mediates

the hitherto missed environmental training - performance link in aviation literature. As a result, we address an essential research gap in existing knowledge by investigating the mediating effect of GWE in the ET - EP link. Furthermore, we investigate the moderated mediation function of ELS in the connection between ET and EP in the aviation industry through GWE.

This article has several contributions. First, this work exams the effect of ET on EP through GWE. ET is considered an important green practice that significantly enhances EP as well as the mediating role of GWE in the aviation industry. With our research, we investigate that the aviation industry provides ET to employees and gives them the opportunity to fully utilize environmental training, with an evaluation of its effectiveness. Second, this article develops to explain how ET affects EP and the mediating role of GWE based on SET. We investigate that a company that provides efficient ET may enhance employee environmental abilities and knowledge, allowing them to figure out how to recognize and lessen hazards to the environment (Pham *et al.*, 2019), thereby improving EP. Third, the findings indicate that ELS has a moderating effect on the influence of ET on EP via GWE. For green activities in the aviation industry, one suggestion is to provide ET to employees that will help them achieve green performance. And when airline companies receive green support from management levels and environmental priorities, it will stimulate employees to effectively apply training in environmental activities at will, and positively, it will encourage them to pay more attention to green efficiency.

This type of article is arranged as: the introduction in Section 1; next Theoretical development in Section 2. Section 3 presents Method and data analysis. Section 4 shows the Findings, discussion is in Section 5. Finally, Section 6 displays the conclusion.

## 2. Theoretical background

### 2.1. Greening training and employee environmental performance.

Training is a vital HRM task for improving organizational performance. Kotey and Folker (2007) state that training is considered “a planned and systematic effort to modify or develop knowledge, skills, and attitudes through experiential learning, with a view to achieving effective performance in an activity or series of activities”. Therefore, in the green environment, ET is “an activity that focuses on developing the skills, knowledge, and attitudes of employees, preventing the decline of knowledge, skills, and attitudes related to EP. Activities that educate employees about the value of EP, train them in energy-saving work methods, reduce waste, raise environmental awareness within the organization, and create opportunities for members participating in solving environmental problems" (Zoogah, 2011, p.133). Ones and Dilchert (2012) argue that this is more relevant when contributing to

organizational employees and, more specifically, employees' views on an organization's environmental performance, as the workforce "will provide a more accurate picture of environmental performance." (p. 451). EP is evaluated in the context of the green revolution (Paille & Meija-Morelos, 2019). The term "employee environmental performance" can be used in the context of this study to refer to environmental behaviors that are legislated, controlled, and awarded by the business (Pham *et al.*, 2020).

The social exchange hypothesis is employed in this study to explain the relationship between ET and EP. Based on SET (Blau, 1964), social exchange occurs when individuals from various parties perceive reciprocal benefits and have positive experiences (Rupp and Mallory, 2015). ET is vital in preparing employees for workplace difficulties and changes, as well as motivating them to be more engaged in their work (Jabbar and Abid, 2015). From this vantage point, we use SET to describe the impact of ET on EP. Hence, we argue that:

H1: Greening training positively impacts on employee environmental performance.

### 2.2. The mediator role of Green work engagement

Work engagement consists of “a positive, fulfilling, work related state of mind that is characterized by vigor, dedication, and absorption” (Schaufeli *et al.*, 2002, p. 74). GWE, on the other hand, is determined by the amount of energy employees put into green work-related duties for which they are prepared to put effort (Aboramadan, 2020). Overall, participation in green work inspires employees to execute environmentally related duties by instilling pride, inclusion, enthusiasm, enjoyment, and energy (Aboramadan, 2020). Green job engagement, which entails the ongoing completion of ecologically focused tasks, is thus critical to maintaining employees' positive emotions (Çop *et al.*, 2021).

ET indirectly improves employee engagement by raising employee motivation to participate in green activities, which ultimately contributes to the development of an organization's employee engagement platform (Curkovic *et al.*, 2000). The application of the principle of reciprocity in green training indicates that when the employee engages in the activity, the business benefits. As a result, employees may respond to these activities by improving their performance. Hence, we argue that:

H2: Green work engagement positively mediates the influence of ET on EP.

### 2.3. The moderated mediation role of Ethical leadership

According to Coyle-Shapiro and Marrow (2003), leaders play a vital role in the transformation process. Given this, we believe that ELS is critical to the transition process. Ethical leaders make decisions and take actions in the best interests of their followers while avoiding injuring them

(Kanungo, 2001). Ethical leadership differs from genuine leadership in that authentic leaders emphasize consciousness and transparency in relationships (Walumbwa *et al.*, 2008). Ethical leaders are truthful, equitable, and reliable (Trevino *et al.*, 2000), as seen by their readiness to provide feedback back to their supervisors (Brown *et al.*, 2005). The principle of reciprocity (Blau 1964) underpins SET, which says that a good deed by one exchange partner makes the other feel bound to return with nice and positive behavior (Gouldner, 1960). When ELS is present, ET has a big impact on GWE. However, as ELS evolves, the function of GWE as a mediator may shift. According to SET (Blau, 1964), the influence of ELS on GWE is better when a company is more focused on ELS and high ET is set. This has an impact on the EP. When firms place less emphasis on ELS, ET activities are reduced, and the influence of ELS on GWE is diminished. As a result, participation in green work increases EP but tends to decline. Hence, we advance the following hypothesis: H3: Ethical leadership moderates the mediating effect of GWE on the link between ET and EP.

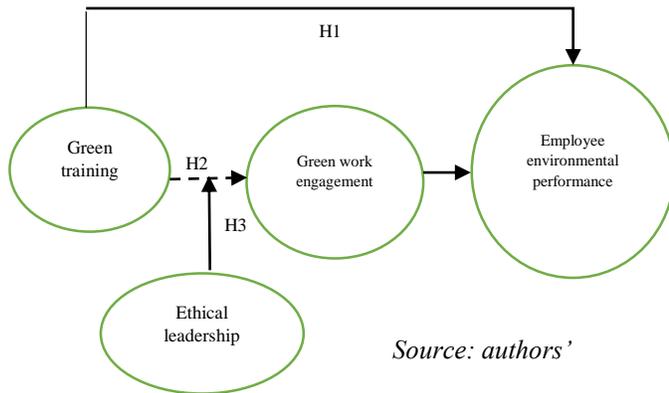


Figure 1: Framework

3. Method and data analysis

3.1 Measures

For all study variables respondents responded to relevant items on a Likert scale ranging from ‘1 = strongly disagree’ to ‘7 = totally strongly agree’.

We modified existing information to measure such entities.

In *ET*, we applied the item scale, which was adapted by Daily *et al.* (2012). The alpha coefficient is 0.914.

*GWE* was measured using a six-factor scale adapted by Mohammed Aboramadan based on Schaufeli *et al.*, 2006. Example is “I am proud of the environmental work that I do”. The alpha coefficient was 0.971.

*ELS* was measured using the eight-item Ethical Leadership Scale built by Brown *et al.* (2005). Sample items were “My leader listens to what employees have to say” and “My leader can be trusted.” The alpha coefficient was 0.971.

*EP* was evaluated employing the scale that was improved by Pham *et al.*, 2020. Example is “I carry out the

environmental duties outlined in my work description.” The alpha coefficient was 0.914.

Table 1 describes all structures and elements. Values such as factor loadings, Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE) were used to evaluate the measure. First, all of the constructs' Cronbach's alpha and composite reliability values were more than 0.7 (Nunnally and Bernstein, 1994), indicating reasonable reliability. Second, all factor loadings (Table 1) are greater than 50%. Hair *et al.* (2011) found that all AVE values were greater than 0.7. As a result, it suggests that this study has adequate convergent validity. According to Fornell and Larcker (1981), the square root of the AVE for each concept is bigger than the correlation for all other constructs, indicating a high degree of distributional validity.

We examined the descriptive statistics of the sample. The purpose of descriptive statistics is to describe the characteristics of a sample. The results of each variable are reported in Table 1.

3.2 Control variables

These variables are critical for assessing the impact of interactions within the research model. We adjusted for participant age and gender, which have been found to influence staff results in previous studies.

3.3 Data analysis

Employees who have at least one year of working experience in aviation industry were among those who answered. Google Docs was used by participants to access the questionnaires. To minimize potential shared technological biases, independent surveys were carried out in two waves in February and April 2022 (Podsakoff *et al.*, 2012). In the first wave, ET data was acquired from aviation enterprises as well as EP. The others were accessed in the round 2. After a comprehensive review of the returned questionnaires for concerns such as missing data and major errors, defective questionnaires are destroyed. As a result, 253 surveys were completed. Smart PLS 4.0 software was used to analyze the data.

Table 1: Constructs, factor loadings and descriptive statistics

Constructs	Items	Factor loadings	Mean	Median	Standard Deviation
Green training	ET1	0.842	5.817	6	0.894
	ET2	0.819	5.746	6	0.895
	ET3	0.816	5.607	6	0.947
	ET4	0.846	5.671	6	0.916
	ET5	0.815	5.702	6	0.932
	ET6	0.872	5.758	6	0.909
Green work engagement	GWE1	0.926	4.845	5	1.476
	GWE2	0.926	4.948	5	1.448
	GWE3	0.935	4.952	5	1.388
	GWE4	0.938	5.016	5	1.423
	GWE5	0.935	4.988	5	1.441

	GWE6	0.942	5.016	5	1.394
Environmental performance	EP1	0.940	5.746	6	1.091
	EP2	0.906	5.754	6	1.089
	EP3	0.924	5.611	6	1.069
Ethical leadership	ELS1	0.899	4.127	4	1.527
	ELS2	0.890	3.865	4	1.642
	ELS3	0.860	4.694	5	1.471
	ELS4	0.902	3.98	4	1.531
	ELS5	0.925	4.099	4	1.518
	ELS6	0.910	4.278	4	1.456
	ELS7	0.886	4.321	4	1.468
	ELS8	0.872	4.452	4	1.494
	ELS9	0.903	3.929	4	1.577
	ELS10	0.883	4.464	4	1.404

Source: authors'

**4. Results**

Table 2 shows the descriptive statistics and correlation values for all of the constructs used in this investigation. The study model's hypothesized links were then tested (as shown in Tables 3 and 4 and Figure 2). We looked at the direct impact of environmental training programs on EP as well as the indirect influence on EP. Then, we examine the function of ELS in regulating the link between ET and EP.

**4.1. Direct and indirect effects**

The results are shown in Table 3. ET had a substantial direct influence on EP ( $b = 0.201$ ;  $p < 0.001$ ), 95% CI = [0.141; 0.265], according to direct analysis. As a result, Hypothesis 1 is accepted.

ET has a substantial impact on green job participation ( $b = -0.099$ ,  $p = 0.008 < 0.05$ ), while GWE has a positive impact on EP ( $b = 0.708$ ,  $p < 0.001$ ). The total indirect impact of ET on EP for mediation has a p-value of 0.001, a beta of 0.130, and a 95% CI of [0.068; 0.200]. As a result, H2 is supported.

**Table 2:** Measurement assessment

Constructs	AVE	CA	CR	Age	ELS	EP	ET
ELS	0.975	0.958	0.972	0.315			
EP	0.946	0.855	0.916	0.370	0.831		
ET	0.933	0.887	0.923	0.190	0.314	0.281 ***	
GWE	0.976	0.809	0.971	0.233	0.601 **	0.769 ***	0.089 *
Gender				0.017	0.457	0.129	0.069

Note: \* $p < 0.01$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.001$  Source: authors'

**Table 3:** Path coefficients

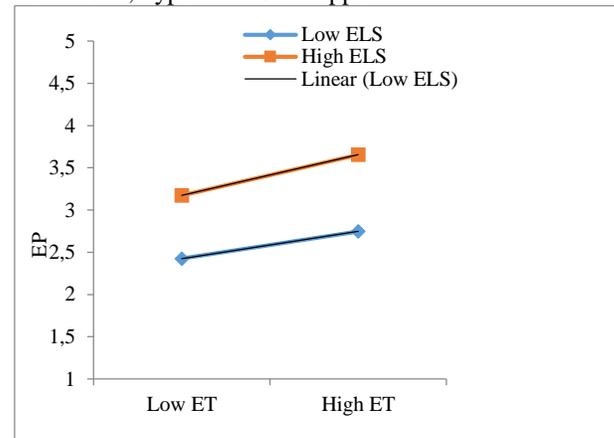
Paths	Coefficient (b)	t-value	P-value	LLCI-ULCI	Conclusions
ET → EP	0.201	5.364	0.000	[0.141; 0.265]	Significant
ET → GWE → EP	0.130	3.248	0.001	[0.068; 0.200]	Significant
ET*ELS → GWE → EP	0.040	1.779	0.038	[0.002; 0.077]	Significant

Source: authors'

**4.2. Moderated mediation effect of ethical leadership hypothesis testing**

We carried out a moderated mediation analysis. We anticipate that ELS will have a moderating effect on the connection between ET and EP through GWE.

The interaction term (ELS\*ET) was shown to have a significant positive connection with GWE ( $b = 0.056$ ;  $p = 0.041 < 0.05$ ); the 95% CI = [0.003; 0.111] does not contain zero. GWE also had a beneficial effect on EP ( $b = 0.708$ ,  $p < 0.001$ ), with a 95% confidence interval of [0.655; 0.758]. The results show that ELS moderates the indirect effect of ET on EP via GWE ( $b = 0.040$ ;  $p = 0.038 < 0.05$ ; 95% CI = [0.002; 0.077]), with the indirect effect being higher when ELS levels are high and weaker when ELS levels are low. As a result, hypothesis 3 is supported.



**Figure 2:** Effects of the interaction between ET and ELS on EP. Source: authors'

This study intends to evaluate the direct effects of ET on EP as well as the mediating effects of green work engagement on such a relationship, as demonstrated by the research questions. This study also looked at the moderated mediation role of ELS in impacting the correlations mentioned above. All the hypotheses in this study were statistically significant.

**4.3. Evaluation of the Structural Model**

According to Hair *et al.* (2019), SRMR should be used to evaluate model fit at the Coefficient of Determination phase. A model is considered to be well-fitted when its SRMR value is less than 0.08; otherwise, the model doesn't quite fit. A SRMR score of 0 would represent a perfect fit, although models can provide SRMR values as high as 0.039 < 0.08 and suggests a good fit for the model.

**Table 4:** Model fit

	Saturated model	Estimated model
SRMR	0.039	0.087
d_ULS	0.490	2.468
d_U	0.523	0.630

Chi-square	1155.021	1286.425
NFI	0.901	0.889

Source: authors'

The second fit measure under Smart PLS is NFI (normed fit index). A model is regarded as a good fit when its NFI value equals 0.901 exceeds 0.90 (Hair *et al.*, 2017). This also applies for all the endogenous constructs' items (Table 4).

PLS-SEM was used to measure the structural model at the next level. Using the R<sup>2</sup> values for the independent and dependent variables, path coefficients were calculated to illustrate the strength of the relationships in the structural model. The coefficient of determination, which has an R<sup>2</sup> value to quantify the model's predictive capacity, is the next step in the structural model evaluation process. Cohen (1992) defines R<sup>2</sup> values of 0.02, 0.13, and 0.26 as small, medium, and large prediction accuracy of the model, respectively. As a result, the R<sup>2</sup> coefficients of EP (0.488) and GWE (0.347) are both large, indicating a satisfactory level of explanation.

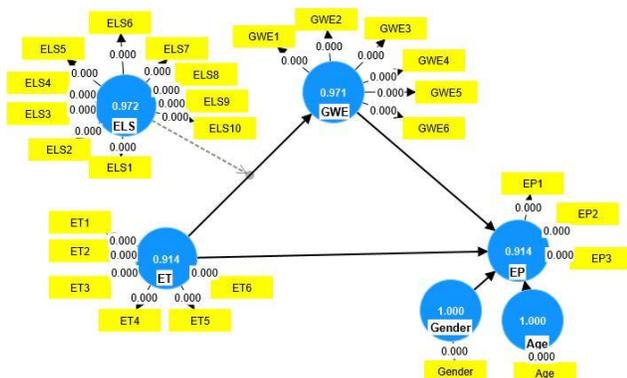
Fourth, PLSpredict in SmartPLS 4.0 was used to further assess the predictive power of Q<sup>2</sup>. The values of Q<sup>2</sup> are 0.488 (EP) and 0.347 (GWE) > 0, which was satisfactory (Hair *et al.*, 2017). Thus, the model had predictive power (Shmueli *et al.*, 2019) as in Table 5.

**Table 5:** Structural model

	R <sup>2</sup>	Q <sup>2</sup>
EP	0.488	0.488
GWE	0.347	0.347

Source: authors'

To obtain values for the path coefficient, a bootstrapping technique is used (Efron & Tibshirani, 1993), as shown in Figure 3.



**Figure 3:** Bootstrapping Model Source: authors'

In the last phase, the effect size f<sup>2</sup> was determined to quantify the projected construct's relative impact over the endogenous construct in terms of explanatory power (Hair *et al.*, 2021). The values 0.02, 0.15, and 0.35 signify minor, medium, and large effects of the exogenous latent variable,

respectively (Hair *et al.*, 2021), allowing for investigation of the structures' importance in explaining the selected endogenous structures (Hair *et al.*, 2017).

**Table 6:** f-square measurement

Path	f <sup>2</sup>	Result
ET → EP	0.092	Small
ET → GWE	0.014	Small
GWE → EP	1.144	Large
ELS x ET → GWE	0.006	Small

Source: author's

The f<sup>2</sup> effect of the relationship between ET and EP (0.092), ET and GWE (0.014), and the interaction between ELS\*ET and GWE (0.006) are weak, except between GWE and EP (1.144) is large as in Table 6.

Conclusion: all the hypothesis are supported and the model has a predictive power.

### 5. Discussion

By investigating the above-mentioned intriguing gaps, our work contributes to the green HRM literature by verifying the research model via the lens of social exchange theory. This study adds to the existing literature in a number of ways.

The purpose of this research is to investigate the direct effects of ET on EP as well as the mediating influence of green job involvement in the aviation industry. Furthermore, the significance of ELS in moderating the influence of ET on EP through GWE is clarified. According to the findings, ET is seen as a key green activity that considerably and favorably improves EP, and GWE plays a mediating role in the industry of aviation. The result is consistent with the argument of Pham *et al.* (2019) and Pham *et al.* (2020). We suggest in our research that the aviation sector provide ET to employees and allow them to fully utilize environmental training, with an evaluation of its performance. Employees' environmental activities following training to encourage them to participate in environmental initiatives in the aviation sector. Indeed, environmental training has been shown to boost employees' environmental awareness and dedication (Jabbour and Jabbour, 2016) by assisting them in understanding how to handle environmental concerns within the firm (Jabbour, 2015).

Second, this study employs SET to construct a reasoning framework that clarifies how ET improves EP as well as the mediating function of involvement. By investigating them, we can explain the theoretical framework for applying this theory to green contexts in order to comprehend the necessity to boost EP through ET programs in order to improve their green performance at work. These findings are consistent with the article's findings, which show that ET improves EP and mediates GWE. We suggest, based on SET, that a company that delivers an effective ET can enhance employees' environmental knowledge and abilities, allowing them to

notice and mitigate environmental problems (Pham *et al.*, 2019), thus improving employee climate.

Third, the findings show that ELS has a moderating effect on the influence of ET. Our findings are consistent with those of Lepak *et al.* (2006), who claim that while training to develop skills and knowledge is vital, a lack of organizational support or opportunities for employees will limit their willingness and discretion in their work. It is also consistent with those of Liao and Chuang (2004), who claim that while training to increase skills is vital, employees' motivation and willingness to work on the job would be limited if there is a shortage of organizational support or possibilities.

One suggestion for green aviation companies is to provide ET to employees, which will help them acquire green knowledge and skills. Green support from management and environmentally oriented priorities will encourage employees to apply trained knowledge. It motivates people to pay more attention to green performance by providing them with knowledge and skills in environmental activities on a discretionary and proactive basis.

## 6. Conclusion

Previous research has suggested management implications for organizational environmental strategy and management to promote environmental behavior (Pham *et al.*, 2019), employee determination to use environmentally sustainable work methods (Haider *et al.*, 2019), firm eco-efficiency (Moraes *et al.*, 2018), and firm performance (Peng *et al.*, 2018). However, practical implications for increasing employee in-role green performance based on good environmental training programs are still limited; therefore, the following management recommendations are required for enterprises, particularly those dealing with hotels. Based on the findings of the analysis, our study offers practical advice to the aviation industry on how to improve employee environmental performance and establish effective green policies.

First, in light of the foregoing findings, operations management in the aviation industry should prioritize an effective environmental training program in order to encourage employee engagement in environmental activities and improve staff environmental performance. Employees who have been successfully trained and equipped with the essential environmental knowledge and skills are ready to apply that knowledge and abilities to environmental duties, which is critical for achieving green operational efficiency. As a result, there is a need to immediately give proper environmental training to personnel in order to develop the necessary environmental knowledge and abilities. Managers and supervisors must thoroughly evaluate employee environmental performance following training in order to discover program gaps and

inadequacies and enhance environmental training programs.

Second, the significance of green work involvement as a moderator in the relationship between environmental training and employee environmental performance is underlined, particularly in the aviation industry. Understanding how such airlines foster employee involvement and environmental responsibility would enable improved employee environmental performance. According to Kehoe and Wright (2013), HRM policies contribute to increased employee engagement, which is similar to the proposal made by Pinzone *et al.* (2019) in a green context. This increases employees' green accountability for necessary green tasks, resulting in better green results.

## 7. Limitations and further studies

Although we have tried to fill the research gaps of previous studies, there are still some limitations. Our proposal could be a good starting point for additional investigation. Policies aimed at increasing employee involvement, for example, will allow employees to get involved in green activities and assist them in efficiently enforcing green standards.

Second, our paper adds to current knowledge by delving into aspects of the relationship between ET and EP, as well as the mediating impacts of GWE and the role of ELS. Although our discussion touches on crucial topics for explaining those findings, a qualitative study focusing on a cultural viewpoint would be preferable in analyzing the outcomes of applying green HRM in general and environmental training programs in particular. A study focused on investigating these is a significant idea for future research, something that is currently absent in the theoretical literature.

Moreover, this article focuses on the aviation industry in Vietnam. The hypothesized relationships may alter when evaluated in various countries and service industries.

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