

# Measuring the Link Between Green Human Resource Management and Green Work Efficiency - An Approach Based on Lecturers at Non-Public Universities in Hai Phong City

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**Abstract:** In the context that Vietnamese higher education is moving towards sustainable development, green human resource management is considered an important solution to improve the efficiency of green work of lecturers. The study aims to measure the association between green human resource management and green work efficiency of lecturers at non-public universities in Hai Phong City. Through 369 survey samples along with analysis methods such as descriptive statistics, scale reliability testing, exploratory factor analysis (EFA), correlation analysis, and multivariate linear regression. The results of the study show that 6 factors have a positive and statistically significant influence on the green work performance of lecturers, including: green recruitment, green training and development, green leadership, green rewards, lecturer involvement and green work-life balance. Meanwhile, the two factors of green selection and green performance management and appraisal are not statistically significant. Based on the findings, the study proposes several implications to improve the efficiency of green work of lecturers, which is the basis for promoting universities to achieve sustainable development goals, meeting the requirements of integration and competition in higher education today.

**Keywords:** Green human resource management, green work efficiency, lecturers, non-public universities, Hai Phong City

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## 1. INTRODUCTION

In recent decades, climate change, resource scarcity, and environmental degradation have become global challenges with widespread impacts on all sectors of socio-economic development. Countries, organizations, and businesses are compelled to shift their operating models towards “green” practices to meet the goals of sustainable development, reduce greenhouse gas emissions, and work toward the goal of carbon neutrality. In Vietnam, the strong commitment at the COP26 Conference to achieve Net Zero by 2050 further affirms the importance of integrating “green” elements into all production, business, and management activities. In this context, the role of higher education plays a particularly vital role. Universities are not only a place to train human resources for the economy but also a center for spreading knowledge, ideas, and sustainable actions to the community. To fulfill this mission, the human factor, especially the teaching employee, plays a crucial role. Lecturers are both direct teachers and researchers, as well as agents who inspire and guide behavior for the next generation of students, who are the future members of society. Therefore, managing the teaching employee with a focus on greening is not only an internal management requirement but also has strategic importance in promoting sustainable development nationally. Green human resource management has emerged as a modern management approach, aiming to embed environmental values throughout the entire human resource lifecycle: from recruitment, training, development, and evaluation to encouraging green behaviors. As a result, organizations aim to build a workforce with environmentally conscious awareness and behaviors, thereby enhancing the effectiveness of green initiatives. The effectiveness of lecturers' green initiatives is not only shown in the quality of teaching and research but also in how they incorporate environmental protection, efficiently use resources, and promote green values while performing their professional duties to serve the community in a way that reduces negative environmental impacts.

Hai Phong City is one of the major economic, industrial, and educational centers of the Northern Coast region. The need to innovate education governance with a focus on sustainability is becoming increasingly urgent. As an important seaport city, Hai Phong is at the forefront of strategies for green development, the marine economy, and high-tech industries. Therefore, training institutions in the city need to work alongside and adapt to these changes to produce high-quality human resources who possess knowledge, skills, and environmentally friendly attitudes. In this system, non-public universities are increasingly

emphasizing their important role, not only helping to ease the burden on public universities but also providing more diverse and flexible options for learners, particularly in human resource training aligned with market needs. However, in reality, green human resource management activities at many non-public universities in Hai Phong remain fragmented, mainly limited to general incentive policies without establishing a well-organized and synchronized management system. The connection between personnel policies and environmental protection has not received enough attention; the training and development of lecturers in green practices remain limited; meanwhile, the mechanism for assessing and motivating the effectiveness of green initiatives has not been clearly established. This results in a relatively low level of lecturers' participation in activities related to green values and limits the overall impact of green efforts. With the demands of innovation and international integration, along with the research gap regarding the link between green human resource management and the green work efficiency of lecturers at non-public universities in Hai Phong, conducting research is essential for university managers to develop suitable human resource policies that align with both local and national sustainable development goals.

## 2. LITERATURE REVIEW AND RESEARCH MODEL

Green human resource management encompasses policies, programs, and activities aimed at fostering environmentally friendly values, attitudes, and behaviors within an organization's workforce. Its purpose is not only to achieve effective human resource management but also to enhance the organization's green efficiency and support sustainable development goals (Tang et al., 2018). Green human resource management is viewed as a vital part of sustainable human resource management, reflecting the organization's social responsibility in addressing environmental impacts while boosting operational efficiency (Al-Kerdawy, 2019; Tulsi & Ji, 2020). According to Opatha and Arulrajah (2014), green human resource management encompasses the entire process of developing, implementing, and continuously maintaining policies to "green" the human resources in the organization. This approach aims to transform workers from passive roles into "green personnel," meaning they develop awareness, attitudes, and behaviors aligned with environmental goals. This not only helps the organization achieve its environmental objectives but also creates value for individuals, communities, and society. Moreover, employees' environmental behaviors are more effectively promoted when the organization systematically implements green human resource management through green recruitment, green training, and green reward systems to encourage eco-friendly actions (Harris & Tregidga, 2012).

In higher education, the use of green human resource management is especially important. Universities, as centers for training and knowledge dissemination, are increasingly prioritizing meeting quality standards related to sustainable development and creating a green, clean, and welcoming learning and research environment. Employee members, especially the teaching personnel, play a crucial role in this effort (Nguyen, 2025). The study by Thai (2025) shows that to achieve green goals, the human resources department must integrate core human resource management functions with environmental management. This ensures alignment between the human resources strategy and the university's sustainable development strategy. Specifically, green human resource management in universities can focus on three main areas: (i) attracting and recruiting green lecturers, prioritizing candidates with awareness of and commitment to sustainable development goals; (ii) training and developing green lecturers to enhance their knowledge, skills, and motivation to incorporate environmental factors into teaching, research, and community service activities; (iii) maintaining and engaging green lecturers through compensation mechanisms, remuneration regimes, job evaluation systems (KPIs), and motivational factors such as a friendly work environment, opportunities for promotion, recognition, and respect. Therefore, green human resource management is an overall strategic approach that links human resource goals with sustainable development objectives. In higher education, green human resource management extends beyond traditional HR practices to transform lecturers into "green lecturers," making positive contributions to the university's environmental goals and promoting the value of sustainable development among students and the wider community.

Green efficiency is a concept that developed from traditional efficiency theory but expanded to incorporate environmental considerations. According to Neely et al. (1995), green efficiency reflects the environmental impacts an organization produces, including its level of compliance with environmental regulations and its ability to implement ecological practices within its management system. Olsthoorn et al. (2001) argue that green efficiency can be seen as a tool to measure the interaction between the

organization and the natural environment, thereby allowing the assessment of the organization's engagement with sustainable development goals. The research by Wulansari et al. (2018) emphasizes that green efficiency is fundamentally the concept of work efficiency but is adapted to the goals of green human resource management. Specifically, work efficiency not only measures productivity, quality, or professional results, but is also linked to employees' positive contributions to the organization's green goals. Likewise, Opatha and Arulrajah (2014) define green efficiency as the extent to which employees engage in green behaviors and generate value consistent with the organization's sustainable development objectives within a given period. In the context of higher education, green work efficiency can be understood as how well teaching employees not only complete their duties in teaching, research, and community service but also actively incorporate green values into their work. This includes using resource-saving teaching methods, encouraging students to raise awareness about environmental protection, participating in scientific research focused on sustainable development, and actively working to minimize negative environmental impacts. Therefore, the success of lecturers' green efforts reflects not only their expertise but also their dedication and contribution to the university's green goals.

Based on AMO theory, many scholars use this basic framework to explain how green human resource management influences environmental sustainability and organizational performance (Ngo et al., 2022; Thai, 2025). According to this theory, the interaction of ability, motivation, and opportunity forms the basis of success at work (Campbell et al., 1993). The AMO model suggests that employee performance and behavior align with organizational goals when they are provided with three elements: appropriate abilities, motivation, and opportunities (Fawehinmi et al., 2020), and that these elements are further improved through human resource management practices (Jackson et al., 2014). Additionally, the authors review various domestic and international studies related to green human resource management to identify and select suitable factors for the proposed research model.

Cheema and Javed (2017) expanded the research area of green human resource management by highlighting that activities such as recruitment, selection, performance evaluation, and reward not only serve traditional human resource functions but also play a significant role in implementing organizational social responsibility. Green human resource management is a crucial factor in helping organizations achieve sustainable development goals. Shah's (2019) study developed a more comprehensive scale for green human resource management practices, with a system comprising seven factors: (i) green job analysis and design, (ii) green recruitment and selection, (iii) green training and development, (iv) green performance management, (v) green rewards and compensation, (vi) green health and safety, and (vii) green labor relations and employee engagement. This system has made a significant contribution to providing empirical evidence that completes the theoretical foundation of green human resource management. According to Al-Swidi et al. (2021), based on AMO theory, they created a green human resource management scale with five components: green recruitment and selection, green training and development, green performance management and evaluation, green rewards and compensation, and employee empowerment and participation. The study results indicate that green human resource management, along with green leadership behavior, positively influences the development of a green organizational culture. Simultaneously, green culture directly affects employees' green behaviors and the organization's environmental performance. Additionally, the research by Guerci et al. (2016) examines green human resource governance from a stakeholder theory perspective, highlighting that pressure from stakeholders (customers, regulators, communities) significantly influences decisions to adopt green human resource management practices. This study evaluates green efficiency based on five criteria: direct and indirect emissions, material recycling, renewable energy use, green product development, and energy consumption. The analysis shows that while customer pressures mainly influence most green human resource management practices, regulatory pressures primarily affect recruitment, training, employee engagement, and green performance management. According to Bombiak and Marciniuk-Kluska (2018), green human resource management significantly influences green efficiency. This indicates that the extent of green human resource management implementation relies on the organization's awareness of the environmental impact and the socio-economic benefits these practices offer. The study by Lirn et al. (2013) assessed green efficiency based on three main factors: (i) reducing negative environmental impacts (such as decreasing paper use, plastic waste, and energy consumption), (ii) meeting solid waste disposal targets during operations, and (iii) adhering to recycling commitments. This perspective is supported by Ren et al. (2018), who argue that environmental sustainability is often viewed as a "cost" that impacts profits, but in reality, enhancing environmental efficiency offers many business

advantages, such as improving the organization's image and reputation, revenue growth, customer loyalty, attracting and retaining personnel, and reducing operating costs (Sweeney, 2009). Simultaneously, Datta (2015) highlights the importance of balancing employees' work and green life; focusing solely on their professional roles and ignoring roles outside of work can prevent green human resource management from reaching its full potential. Therefore, in this study, the authors expand the model to examine the impact of green human resource management through AMO theory, combined with the balance between work and green life of human resources, on the organization's green efficiency, with the following hypotheses:

According to Ayandibu (2019), green leadership is seen as a key factor in enhancing the efficiency of organizational green initiatives. Green leadership not only guides but also empowers employees to actively participate in and adopt behaviors linked to green efficiency. The actions and decisions of leaders significantly influence employee attitudes, commitment levels, behavior, and both financial and non-financial organizational performance (Robertson and Barling, 2013). Specifically, when leaders consistently demonstrate environmentally friendly behaviors, they can persuade and motivate employees to follow their example, thereby establishing and strengthening a green culture within the organization (Rodríguez and Cruz, 2007). Based on this, the research hypothesis is proposed as follows:

H1: Green leadership positively influences the green work efficiency of lecturers at non-public universities.

Green training and development is a key component of green human resource management, which helps organizations equip members, including employees and managers, with the knowledge, skills, and attitudes needed to engage in environmental activities (Cook & Seith, 1992). Through training, awareness of environmental issues among lecturers is improved, fostering a positive attitude and encouraging a proactive approach to reducing waste, conserving energy, and participating in green initiatives (Zoogah, 2011). Sarkis et al. (2010) also emphasized that training is the foundation for supporting green management systems and enhancing operational efficiency. Simultaneously, integrating environmental factors into training and human resource development programs also helps build a green organizational culture and promotes a long-term commitment to sustainability goals (Teixeira et al., 2012). From there, the research hypothesis is proposed as follows:

H2: Green training and development positively influences the green work efficiency of lecturers at non-public universities.

To build an environmentally-focused workforce, organizations can choose between two strategies: (i) green recruitment, attracting candidates who already possess environmentally friendly awareness, values, and behaviors from the beginning; or (ii) green training and development, enhancing awareness and skills to protect the environment among current employees. Specifically, green recruitment is seen as a more proactive and effective approach, helping organizations develop human resources aligned with sustainable development goals (GuRewa & GuRewa, 2013). Consequently, identifying the most effective green recruitment methods is a key task for organizations, and leveraging "green" messaging to attract talent and promote environmentally friendly practices has become increasingly vital. Based on this, the research hypothesis is proposed as follows:

H3: Green recruitment positively influences the green work efficiency of lecturers at non-public universities.

According to Renwick et al. (2013), candidates tend to prefer working at organizations with strong environmental reputations. Conversely, employers value candidates who possess knowledge, skills, and a positive attitude toward environmental issues, as they are more likely to engage in sustainability initiatives (Jabbour et al., 2010). In fact, many organizations have incorporated "green" criteria into their selection process, such as asking questions about environmental perceptions and behaviors during interviews (North, 1997; Revill, 2000). The alignment between a candidate's green values and the organization's focus is seen as a crucial foundation for establishing long-term commitment and contributing positively to environmental goals. From there, the research hypothesis is proposed as follows:

H4: Green selection positively influences the green work efficiency of lecturers at non-public universities. Epstein and Roy (1997) argue that when HR managers incorporate environmental factors into their performance management systems, they help ensure that environmental management practices are upheld and negative impacts are reduced. Today, many organizations have integrated environmental assessment standards and indicators into their performance management systems, and some are even conducting green audits to collect data and monitor environmental performance (Alfred & Adam, 2009).

In particular, performance appraisal is considered the most vital aspect, not only to ensure fairness, reliability, and validity but also to provide practical feedback to help employees improve green behavior and boost the organization's environmental performance (Jackson et al., 2011). Based on this, the proposed research hypothesis is as follows:

H5: Green performance management and appraisal positively influences the green work efficiency of lecturers at non-public universities.

Following a strategic approach to human resource management, modern organizations are increasingly focusing on designing reward systems to motivate employees to engage in environmentally friendly initiatives. Research by Forman and Jorgensen (2001) indicates that employees' commitment to environmental management programs is strengthened when they receive rewards or remuneration related to environmental tasks. According to Berrone and Gomez-Mejia (2009), organizations with high ecological performance tend to pay higher salaries and bonuses to CEOs and employees than those with lower ecological performance. This indicates that green rewards and compensation not only boost employee motivation but also directly enhance the organization's environmental efficiency. From there, the research hypothesis is proposed as follows:

H6: Green rewards positively influences the green work efficiency of lecturers at non-public universities. According to Alt and Spitzack (2016), employee involvement plays a significant role in fostering an environmentally friendly organizational culture through open discussions, sharing views, and exchanging opinions on environmental issues. Tang et al. (2018) highlighted that clearly communicating the environmental vision and disseminating information via multiple formal and informal channels encourages employees to actively engage in green initiatives. Additionally, establishing green working groups provides an effective way for employees to collaborate, share experiences, and suggest new solutions to the organization's environmental challenges (Daily et al., 2007). Based on this, the research hypothesis is proposed as follows:

H7: Lecture involvement positively influences the green work efficiency of lecturers at non-public universities.

Green work-life balance is an emerging concept in green human resource management, emphasizing the development of environmentally friendly values and attitudes in both employees' work and personal lives, thereby creating a workforce that is fully imbued with green values. According to Datta (2015), much of the green characteristics and attitudes of employees are shaped by the organization they work for. Therefore, implementing green work-life balance policies will encourage employees to share ideas and suggest environmental initiatives, helping the organization achieve sustainable development goals (Fombrun et al., 2000). From there, the research hypothesis is proposed as follows:

H8: Green work-life balance positively influences the green work efficiency of lecturers at non-public universities.

Summarizing the above hypotheses, the research model proposed is as follows:



Figure 1. Research model

Source: Recommended by the authors

### 3. Research methods

#### 3.1. Data collection

Data were collected using survey questionnaires between January 2025 and March 2025. The study employs a five-point Likert scale, ranging from level 1 (strongly disagree) to level 5 (strongly agree). The preliminary scale is based on both domestic and foreign studies, as outlined in the research overview section, and consists of 36 observation variables. To ensure the appropriateness of the situation, the authors first assessed the cohesion of lecturers at non-public universities. Before including this in the formal survey, they conducted a group discussion with 20 lecturers working at different non-public universities in Hai Phong city and consulted with five experts. The results indicate that the elements in the preliminary scale received high approval, but some observed variables need to be adjusted to better suit the Vietnamese context. The sample size for the study was determined based on the recommended rate for exploratory factor analysis (EFA) according to Hair et al. (2010). To prevent invalid responses from being discarded during data cleaning and impacting the analysis results, the total number of responses collected by the authors was actually 380. A convenient non-probability survey method was chosen, combining live streaming of the survey with email distribution to lecturers working at non-public universities in Hai Phong City. The results yielded 369 valid responses, eligible for analysis at a 5% significance level.

#### 3.2. Data analysis

The study employs methods such as descriptive statistics, reliability tests, EFA, correlation analysis, and linear regression using SPSS 26 software to examine and measure the link between green human resource management and green work efficiency of lecturers at universities outside public institutions in Hai Phong City. The general research equation is written as follows:

$$GWE = \beta_0 + \beta_1 * GL + \beta_2 * GTD + \beta_3 * Rec + \beta_4 * GS + \beta_5 * GPMA + \beta_6 * Rew + \beta_7 * LI + \beta_8 * GWLB + \varepsilon$$

GWE (Dependent variable): Green work efficiency of lecturers

Independent variables ( $X_i$ ): Green leadership (GL), Green training and development (GTD), Green recruitment (Rec), Green selection (GS), Green performance management and appraisal (GPMA), Green rewards (Rew), Lecture involvement (LI), Green work-life balance (GWLB).

$\beta_k$ : Regression coefficient ( $k = 0, 1, 2, \dots, 8$ ).

$\varepsilon$ : Random error.

### 4. Research results

The statistical analysis of the 369 valid survey samples collected shows that, in terms of gender, 198 individuals are male, representing 53.7%, and 171 are female, accounting for 46.3%. Regarding age distribution, the survey results reveal that lecturers between the ages of 25 and 35 make up the largest group, numbering 147 or 39.8%, followed by the 36 to 45-year-old cohort with 118 individuals, or 32.0%. The 46 to 55-year-old group consists of 76 individuals, or 20.6%, while those over 55 years old number 28, constituting 7.6%. Concerning educational attainment, 52 lecturers hold university degrees, accounting for 14.1%; 232 have master's degrees, making up 62.9%; and 85 have doctoral degrees, representing 23.0%. In terms of professional seniority, 26.6% of the lecturers have less than five years of teaching experience, another 26.6% have between five and ten years, 24.1% have between eleven and fifteen years, and 14.9% have more than fifteen years of experience.

**Table 1. Reliability testing**

Scale	Scale Mean if Item deleted	Scale Variance if Item deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item deleted
Green leadership	Cronbach's Alpha = 0.790			
GL1	10.11	4.513	0.590	0.781
GL2	9.87	4.097	0.576	0.772
GL3	9.36	3.626	0.581	0.764
GL4	11.25	2.491	0.537	0.757
GL5	10.37	2.118	0.515	0.732
Green training and development	Cronbach's Alpha = 0.821			
GTD1	8.25	5.579	0.618	0.815
GTD2	8.71	3.106	0.692	0.791
GTD3	8.46	4.814	0.647	0.784

Scale	Scale Mean if Item deleted	Scale Variance if Item deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item deleted
Green Recruitment	Cronbach's Alpha = 0.806			
Rec1	10.25	3.841	0.588	0.799
Rec2	10.46	4.210	0.546	0.761
Rec3	10.77	3.795	0.521	0.750
Rec4	10.39	3.384	0.536	0.724
Rec5	9.87	4.202	0.634	0.713
Green selection	Cronbach's Alpha = 0.857			
GS1	9.61	7.178	0.682	0.833
GS2	9.68	7.592	0.654	0.829
GS3	9.73	6.016	0.637	0.815
GS4	9.80	6.415	0.616	0.801
Green performance management and appraisal	Cronbach's Alpha = 0.834			
GPM1	10.72	3.531	0.592	0.827
GPMA2	11.39	3.892	0.567	0.819
GPMA3	11.85	3.908	0.621	0.811
GPMA4	10.74	3.475	0.548	0.804
Green rewards	Cronbach's Alpha = 0.781			
Rew1	8.96	4.252	0.671	0.776
Rew2	7.56	3.876	0.659	0.751
Rew3	7.87	4.109	0.642	0.739
Rew4	8.12	4.317	0.630	0.726
Lecture involvement	Cronbach's Alpha = 0.813			
LI1	6.59	3.913	0.599	0.806
LI2	7.08	3.851	0.578	0.798
LI3	6.89	4.011	0.565	0.787
Green work-life balance	Cronbach's Alpha = 0.840			
GWLB1	10.57	5.421	0.612	0.823
GWLB2	11.24	3.755	0.539	0.817
GWLB3	10.63	4.863	0.573	0.809
GWLB4	11.98	5.606	0.620	0.793
GWLB5	11.03	4.237	0.538	0.785
Green work efficiency of lecturers	Cronbach's Alpha = 0.829			
GWE1	10.53	3.975	0.622	0.817
GWE2	11.86	4.201	0.589	0.780
GWE3	10.99	3.884	0.575	0.756

Source: Authors' analysis results

The results of the reliability analysis for the independent and dependent factor scales show that the Cronbach's Alpha coefficients are above 0.7 and higher than the Cronbach's Alpha if Item deleted. Simultaneously, the Corrected Item-Total Correlation exceeds 0.3, indicating that the scale has good reliability, and no variables need to be removed. This makes them eligible for inclusion in the exploratory factor analysis (Hair et al., 2010).

**Table 2. EFA of independent variables**

<b>KMO = 0.814</b>		
<b>Bartlett's Test</b>	Approx. Chi-Squared	11672.094
	df	476
	Sig.	0.000

Items	Factor							
	1	2	3	4	5	6	7	8
GPMA3	0.798							
GPMA2	0.781							
GPMA1	0.763							
GPMA4	0.745							
Rec5		0.808						
Rec2		0.795						
Rec4		0.756						
Rec1		0.732						
LI1			0.816					
LI3			0.792					
LI2			0.760					
GL1				0.835				
GL3				0.812				
GL4				0.791				
GS3					0.803			
GS1					0.782			
GS2					0.760			
GS4					0.747			
GTD2						0.825		
GTD1						0.809		
GTD3						0.781		
Rew4							0.783	
Rew2							0.775	
Rew1							0.761	
Rew3							0.748	
GWLB1								0.814
GWLB2								0.797
GWLB5								0.766
GWLB4								0.752
GWLB3								0.732
% of Variance	20.157	31.764	38.911	40.152	49.829	57.611	64.532	79.125
Eigenvalues	6.912	5.870	4.892	3.767	3.016	2.482	1.877	1.125

Source: Authors' analysis results

The first exploratory factor analysis revealed a satisfactory KMO coefficient, ranging from 0.5 to 1, with a Significant Value. Value of 0.000, confirming that the input data was statistically significant. However, in the rotation matrix table, the two observation variables, REC3 and GL,5 had factor loadings of less than 0.5, and the observed variable GL2 was loaded onto two groups of factors. Therefore, these three variables were considered poor variables, and the authors decided to remove them and conduct a second reanalysis. The results after removing these variables using the PCA extraction method and Varimax rotation showed that the KMO coefficient improved to 0.814, with Bartlett's test significance less than 0.05. With an eigenvalue greater than 1, eight factors were extracted, explaining a total variance of 79.125%. All factor loadings within these groups were above 0.5. Therefore, the data satisfied the requirements of Hair et al. (2010) and were suitable for further analysis.

**Table 3. EFA of the dependent variable**

KMO = 0.809		
Bartlett's Test	Approx. Chi-Squared	345.269
	df	3
	Sig.	0.000
Scale	No.	Loading

Green work efficiency of lecturers	GWE1	0.791
	GWE2	0.785
	GWE3	0.767
% of Variance	80.132	
Eigenvalue	1.934	

Source: Authors' analysis results

The results of the EFA for the dependent variable showed that the KMO coefficient reached 0.809, proving that the data was suitable for conducting factor analysis. At the same time, Bartlett's test has a Chi-squared value of 345.269 with Sig. = 0.000, which is less than 0.05 significance level, confirming a strong linear correlation between the observed variables included in the factor analysis. The results of the rotation matrix table, when analyzed using the PCA extraction method and the Varimax rotation, indicate that all three observed variables form a single group of factors with a factor load coefficient greater than 0.7, far exceeding the minimum threshold of 0.5 as recommended by Hair et al. (2010). This demonstrates that these variables effectively represent the underlying concept, with a total variance of 80.132, well above the 50% threshold. Therefore, the dependency factor scale has good convergence, ensures unidirectionality, and is suitable for inclusion in subsequent analyses.

**Table 4. Correlation Analysis**

	GWE	GL	GTD	Rec	GS	GPMA	Rew	LI	GWLB
GWE	1								
GL	0.713**	1							
GTD	0.680**	0.220**	1						
Rec	0.695*	0.178*	0.276**	1					
GS	0.732**	0.197**	0.214**	0.192**	1				
GPMA	0.678**	0.215**	0.180*	0.201*	0.236**	1			
Rew	0.599**	0.193**	0.224**	0.213**	0.178**	0.212*	1		
LI	0.617**	0.274**	0.182*	0.245*	0.165**	0.259**	0.188*	1	
GWLB	0.534*	0.186**	0.269**	0.230**	0.251**	0.178*	0.192**	0.241**	1

\*significant at  $p < 0.05$ , \*\*significant at  $p < 0.01$

Source: Authors' analysis results

The results of the correlation matrix analysis show that the correlation coefficients between the pairs of independent factors are not unusually high and are all within the safe threshold, so there is no doubt about the phenomenon of multicollinearity in the model. Additionally, there is a good correlation between independent and dependent factors when the correlation coefficient exceeds 0.4 and the Sig. value is less than 0.05. Therefore, the data are suitable for regression analysis (Hair et al., 2010).

**Table 5. Multivariate regression analysis**

		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
		B	Standard deviation	Beta			Tolerance	VIF
1	(Constant)	0.175	0.019		2.584	0.012		
	GL	0.332	0.027	0.349	2.612	0.000	0.549	1.812
	GTD	0.295	0.015	0.306	2.536	0.002	0.685	1.799
	Rec	0.376	0.021	0.388	2.508	0.000	0.676	1.805
	GS	0.230	0.014	0.255	0.659	0.083	0.591	1.743
	GPMA	0.216	0.028	0.234	0.541	0.159	0.622	1.721
	Rew	0.306	0.013	0.325	2.603	0.000	0.593	1.846
	LI	0.259	0.026	0.283	2.527	0.001	0.640	1.705
	GWLB	0.351	0.012	0.364	2.625	0.006	0.511	1.839

$R^2 = 0.792$ , Adjusted  $R^2 = 0.784$ , Sig. = 0.000, Durbin - Watson = 1.813

Source: Authors' analysis results

The multivariate linear regression analysis using the Enter method shows that the overall results of the multiple linear regression with an  $R^2$  value of 0.792 indicate that the model explains 79.2% of the

relevance. Meanwhile, the adjusted  $R^2$  value more accurately reflects how well the model fits the entire data set, with an analysis showing an adjusted  $R^2$  of 0.784. This means that 78.4% of the variability in the dependent variable is explained by the eight factors in the model; the remaining variation is due to factors outside the model and random errors. The Durbin-Watson value of 1.813 suggests that there is no violation of the first-order autocorrelation assumption. Additionally, the results from the ANOVA analysis and the F test show that the statistically calculated value of  $R^2$  has a Sig of 0.000, indicating that the linear regression model is consistent with the data and can be used.

Testing the research hypotheses shows that elements with VIF (variance inflation factor) coefficients are less than 2 and greater than 1, indicating no multicollinearity. In addition to the results of the quantitative analysis, regression diagnostic tests such as scatterplots, histograms, and standard probability plots (P-P plots) all demonstrate that the multivariate linear regression model meets the basic assumptions well. Specifically, the Scatterplot chart displays the residuals randomly distributed around the diaphragm axis (mean = 0), with no specific shape or trend. This indicates that the linear relationship between the variables is appropriate and the variance of the errors is homoscedastic. The histogram shows that the residuals follow a nearly standard distribution, with an average close to 0 and a standard deviation near 1, which confirms that the assumption of error normality is met. At the same time, the P-P Plot shows data points close to the diagonal, indicating that the residuals follow a normal distribution reasonably well, so the regression model does not violate the underlying assumptions. The p-value of the t-test is less than 0.05 for the factors GL, GTD, Rec, Rew, LI, GWLB, while GS and GPMA have significance coefficients greater than 0.05. Therefore, out of the eight factors included in the model, six have a positive and statistically significant effect on the green work efficiency of lecturers at non-public universities in Hai Phong. The two factors, green selection (GS) and green performance management and appraisal (GPMA), are not statistically significant, and the regression equation based on the standardized beta coefficients is written as follows:

$$GWE = 0.388*Rec + 0.364*GWLB + 0.349*GL + 0.325*Rew + 0.306*GTD + 0.283*LI + \varepsilon$$

Thus, six factors positively influencing the green work effectiveness of lecturers at non-public universities in reducing degrees are: green recruitment, green work-life balance, green leadership, green rewards, green training and development, and lecture involvement. The two factors of green selection and green performance management and appraisal do not reflect the practice at non-public universities in Hai Phong City; the lecturer selection process often emphasizes professional capacity, teaching experience, and academic qualifications more than green criteria. Factors related to the candidate's green attitude and behavior are rarely considered an important criterion in the selection process. This makes the influence of green selection on the green work efficiency of lecturers unclear. Additionally, performance assessment activities at many non-public universities still mainly rely on traditional criteria such as lecture hours, teaching quality, and scientific research results, without fully incorporating indicators related to environmental goals. The absence of a framework for green assessment criteria and a specific feedback mechanism limits the practical application of green performance management and appraisal factors in improving green work efficiency.

### 5. Implications

First, non-public universities in Hai Phong should focus on green recruitment as part of their team development strategy. The university can include green criteria in the selection process, such as evaluating the candidate's attitude and dedication to sustainable development or asking interview questions related to environmental awareness. This approach helps build a team of lecturers with a strong foundation in green awareness, creating a basis for effective green initiatives in the future.

Second, it is important to enhance training and promote green development for lecturers by regularly organizing courses on education for sustainable development, energy-saving technologies, or teaching methods that incorporate environmental content. This way, lecturers not only boost their professional skills but also cultivate a positive attitude toward applying green solutions in their daily work.

Third, enhance the role of green leaders in universities. The Board of Directors, deans, and department heads need to demonstrate exemplary environmentally friendly behavior and remain consistent in promoting sustainable development. Such consistency from leadership will build trust, inspire, and motivate faculty to follow suit, thereby fostering a green organizational culture across the university.

Fourth, establish a clear green reward and compensation system. Universities should link green work results with rewards, salaries, or other forms of recognition. There are incentives and financial support to encourage lecturers to take initiative in waste reduction, use environmentally friendly teaching

technology, or pursue green research activities. This system will motivate lecturers to be more proactive in adopting green behaviors.

Fifth, encourage more lecturers to participate in environmental initiatives and decision-making. Universities can establish green research groups, hold discussion forums, or set up feedback channels for lecturers to share ideas. This active involvement not only enhances the effectiveness of green efforts but also increases lecturers' engagement with the university.

Sixth, pay more attention to balancing green lifestyle efforts for lecturers. The university needs to build a welcoming work environment, reduce unnecessary stress, and encourage lecturers to maintain a green lifestyle both at work and in their personal lives. This not only enhances the health and satisfaction of lecturers but also makes the green initiatives more effective and sustainable.

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