Jahangirnagar University Journal of Business Research (JUJBR), Vol. 25, No. 02, December, 2025
ISSN 1681-9748

Green Human Resource Management: Examining the Relationship Between Green Training, Green Work Engagement, and Employee Retention

JUJBR

Fatema Sultana[*]
Dr. A.K.M. Moniruzzaman[**]

Abstract: *This study investigates the impact of green training on employee retention, focusing on the mediating role of green work engagement. Grounded in Green Human Resource Management (GHRM), and drawing from social exchange theory and the ability–motivation–opportunity (AMO) framework. A quantitative survey was conducted among 237 Bangladeshi garment workers. Partial least squares structural equation modeling (PLS-SEM) was employed to evaluate the hypothesized relationships. The results indicate that green training has a significant positive effect on employee retention, both directly and indirectly through green work engagement. Specifically, green training enhances employees' engagement in environmentally responsible work, which subsequently improves retention. Besides, the mediation analysis in this study confirms that green work engagement partially mediates the relationship between green training and employee retention. These findings enhance the green human resource management literature by illustrating the dual influence of green training on retention via skill enhancement and psychological engagement. The study emphasizes the necessity of investing in comprehensive green training programs that encompass not only technical skills but also motivational elements. Integrating green training into the overall HRM strategy can improve the company's reputation and attract environmentally conscious workers, which will help the firm retain employees in the long term.*

Keywords: *Green human resource management; Green training; Employee retention; Green work engagement; Sustainability*

1. Introduction

1.1 Background of the Study

The investigation into the impact of green training on employee retention, facilitated by green work engagement, has become a significant area of research owing to the rising global focus on environmental sustainability and organizational competitiveness (Al-Hajri, 2020; Huo et al., 2022). The integration of green human resource management (GHRM) practices has transitioned from traditional HRM approaches to include environmentally

[*] Assistant Professor, Department of Management, Jashore University of Science and Technology, Jashore-7408, Bangladesh. Email: fatema_mgt@just.edu.bd

[**] Professor, Department of Management Studies, Jagannath University, Dhaka-1100, Bangladesh. Email: moniruzzaman64@gmail.com

DOI: 10.53461/jujbr.v25i02.109

sustainable recruitment, training, performance assessment, and compensation over the past decades (Alshaabani et al., 2021). The number of relevant present studies in practice is minimal, despite knowing that turnover intentions in millennials, highlighting the research gap regarding retention mechanisms in green HRM contexts (Islam et al., 2022). This study enquires about the underlying mechanisms of green training (GT) for promoting retention and uncovers the mediating channel of green work engagement (GWE) (Haque et al., 2024). Although GHRM has been identified with positive employee outcomes, existing studies rarely explain how engagement translates GT into retention (Judeh & Khader, 2023).

In this study, GHRM is defined as the integration of environmental objectives into HR policies and practices, GT refers to HRM practices that focus on improving employees' understanding of the environment and their capacity to address environmental issues (Alshaabani et al., 2021), GWE is defined as the intensity of employees' energy, dedication, and absorption in environmentally focused tasks (Aboramadan, 2020), and employee retention (ER) refers to the strategies geared toward maintaining a stable and committed workforce in an organization (Al-Hajri, 2020). The model suggests that GT fosters GWE that acts as a mediating bridge in the relationship between GHRM practices and GT, informed by social exchange theory and the job demands–resources model (Aboramadan, 2020; Haque et al., 2024).

The study examines the effect of GT on ER, specifically highlighting the mediation function of GWE. The empirical context is the Bangladeshi garment industry, selected due to its labor-intensive nature, high turnover rates, and increasing environmental compliance requirements. The study empirically supports these associations, utilizing data from 237 respondents through Partial Least Squares Structural Equation Modeling (PLS-SEM).

1.2 Objectives of the Study

The primary objective of this study is to examine the effect of GT on employee retention, with particular emphasis on the mediating role of green work engagement. Specifically, the study seeks to:

i. examine the relationship between GT and ER.
ii. investigate the relationship between GWE and ER.
iii. analyze the mediating role of GWE in the relationship between GT and ER**.**

1.3 Contribution of the Study

This study advances both theoretical and practical knowledge. In practical terms, it guides organizations on how to improve knowledge retention by linking human behaviors to organizational training practices. Theoretically, it reinforces and extends SET, JD-R, and AMO frameworks within the green HRM domain, satisfying the concern of a clear theoretical contribution. The results provide managers with tangible proof that investing in GT simultaneously fulfills

DOI: 10.53461/jujbr.v25i02.109

corporate sustainability goals while also increasing engagement and retention, leading to a more environmentally responsible and loyal workforce.

2. Literature Review

Environmental training is a valuable tool to retain staff by engaging with them more in the environmental work. Many factors impact the link, yet the most important is green work engagement. GT can significantly enhance employee engagement as they would know the skills and knowledge to participate in environmentally sustainable practices. This engagement is necessary, as it establishes the association between GT and the retention of employees (Dwumah et al., 2025; Tran, 2023). GT can promote high employee engagement in the mining industry, where achieving a level of organizational green culture and green work ethics is a prerequisite to sustaining such engagement benefits (Bahizire & Pea-Assounga, 2024).

The application of GT contributes to a firm's future sustainability performance by cultivating a workforce adept at addressing environmental demands. Recent studies suggest that firms offering novice training through managerial roles enhance employee satisfaction and cultivate essential skills for long-term success (Alhemimah et al., 2024; Bahizire & Pea-Assounga, 2024). GT in tourist and hospitality modules improves sustainable work behavior; it acts as a mediator between green organization learning to sustainable work behavior (Alhemimah et al., 2024). These arguments support the strategic relevance of GT but do not fully explain the psychological mechanism linking training to retention.

Employers must understand how vital the impact of green HRM practices on ER and GWE is as a bridge between green HRM and environmental performance. According to K (2024), engaged employees have a higher tendency to stay when they are given a chance to do meaningful work. Evidence from the hospitality field indicates that the enabling role of GWE is confirmed by green inclusive leadership, which increases green work engagement, subsequently promoting organizational citizenship behavior and retention (Abdou et al., 2023**).** The agriculture sector reveals that green HRM and leadership are critical to green work engagement, emphasizing the immediate need to introduce organizational culture and practices that advocate for environmental sustainability (Tran, 2023). Thus, the synergetic relationship between green HRM, employee engagement, and sustainable techniques (Moran et al., 2025) becomes an indispensable approach for organizations to excel in an environmentally aware market.

GWE represents the relationship between green HRM practices and environmental performance. Abdou et al. (2023) illustrate the mediating role of GWE in the hospitality sector, showing that green inclusive leadership enhances green work engagement, which in turn promotes organizational citizenship behavior and employee retention. Despite this growing body of evidence, a unified empirical model linking green training, green work engagement, and

DOI: 10.53461/jujbr.v25i02.109

employee retention remains underexplored. The interdependent relationship among green HRM, employee engagement, and sustainable practices represents a crucial strategy for businesses (Moran et al., 2025).

Table 1: Empirical studies on Green Training, Engagement, and Retention

Author(s) & Year	Context / Industry	Method	Key Results
Jabbour (2011)	Review of organisations adopting green HRM	Literature review	Highlighted GT as central to embedding sustainability in HRM; suggested positive links with employee outcomes, though empirical evidence is limited.
Paillé, Chen, Boiral, & Jin (2014)	Chinese manufacturing	Survey + SEM	HRM practices (including green training) predicted environmental performance; employee engagement partially mediated effects.
Guerci, Longoni, & Luzzini (2016)	Italian firms	Survey + SEM	Green HRM practices influenced environmental performance via employee involvement and motivation.
Al-Hajri (2020)	Omani service industry	Survey	Training had a significant positive effect on employee retention; it highlighted training as a retention strategy.
Aboramadan (2020)	Higher education (Palestine)	Survey + SEM	Green HRM (training, involvement) positively influenced green work engagement, which mediated green behaviours.
Huo, Li, Zheng, Liu, & Yan (2022)	Chinese firms	Survey + SEM	GT positively affected green behaviours, mediated by green commitment.
Han & Kok (2023)	Meta-analysis across industries	Meta-analysis	Green HRM had overall positive links to sustainability outcomes; mediators like engagement and satisfaction were critical.
Haque, Gopal, & Singh (2024)	Indian firms	Survey + PLS-SEM	GT significantly influenced organizational performance; engagement mediated the effect.
Judeh & Khader (2023)	Jordanian service firms	Survey + SEM	Green HRM positively influenced employee retention through engagement.
Hassanein, Elshaer, & Azazz (2024)	Tourism sector (Egypt)	Survey + SEM	Green HRM increased retention via job satisfaction; suggested multiple mediators beyond engagement.
Present Study (2025)	Manufacturing and service sector, Bangladesh	Survey + PLS-SEM (SmartPLS)	Direct effects: GT → ER $\beta = .597$ ($p < .001$); GT → GWE $\beta = .584$ ($p < .001$); GWE → ER $\beta = .468$ ($p < .001$). Mediation: GWE partially mediates GT–ER (indirect $\beta = .273$, $p < .01$). Confirms GT impacts retention directly and indirectly via engagement.

Source: Authors developed.

DOI: 10.53461/jujbr.v25i02.109

3. Model Specification and Hypotheses of the Study

Based on the objectives of the study and the reviewed literature, the intended hypotheses are as follows:

Hypothesis No.	Hypotheses Statements
H1:	GT is significantly associated with Employee Retention.
H2:	GT is significantly associated with Green Work Engagement.
H3:	GWE is significantly associated with Employee Retention.
H4:	GWEsignificantly mediates the relationship between GT and Employee Retention.

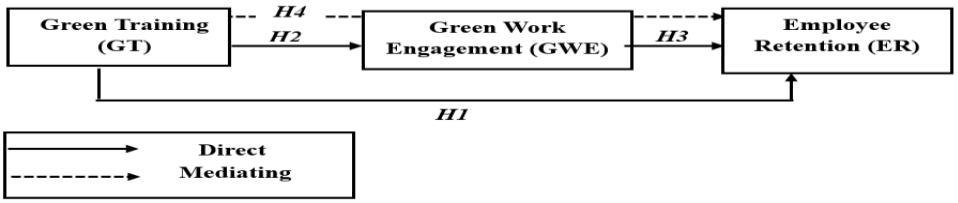

Figure 1. Conceptual Framework (Source: Authors developed)

4. Research Methodology

The research is descriptive in nature and was carried out using a quantitative methodology. A survey employing a 5-point Likert scale questionnaire was used to gather quantitative data for this investigation (the complete questionnaire used in this study is provided in Appendix A). Bangladeshi garment workers at all levels are the study's target population. The garment industry was selected due to its labor-intensive nature, high employee turnover, and increasing environmental compliance requirements, making it a suitable context for examining green HRM practices. Since the majority of Bangladesh's garment factories are situated in the Dhaka division, the sampling frame for this study is made up of these factories. This study was carried out using basic random probabilistic sampling since the population of the apparel industry is well-known. The sample size is 237.

Structured closed-ended questionnaires have been used to collect primary data. Each question is scored on a 5-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree." The targeted participants received questionnaires via pick-and-drop and Google Form. Respondents included employees from different organizational levels (managerial, supervisory, and operational), allowing a comprehensive assessment of green training**.** Using various search engines, secondary data were gathered for this study from appropriate journals, pertinent reports, and online articles.

The dependent variable is employee retention (ER), the independent variable is green training (GT), and the mediating variable is GWE. Employees working in

DOI: 10.53461/jujbr.v25i02.109

factories implementing formal green HR practices (e.g., LEED-certified units) are considered direct beneficiaries of GT initiatives. The gathered data have been analyzed and summarized using SMART PLS-4. There were four sections on the questionnaire. The demographic factors were discussed in the first section. Seven questions were then included in the second section to gather GT data. Nine questions made up the third section, which was used to gather GWE data. Ten questions were included in the last section to gather information on ER. The inclusion of these items directly addresses the concern regarding questionnaire transparency. Data has been coded in Microsoft Excel for analysis. Demographic analysis has been conducted using SPSS 27. PLS-SEM has been applied to testing hypotheses and measurement models. The study's findings have been displayed in various tables.

5. Data Analysis and Discussion

5.1 Demographic Analysis

Respondents' characteristics, such as level of education, age, gender, type of working company, position, and experience, are shown in Table 2.

Table 2. Demographic information of the respondents

Category		Frequency	Percentage (%)
Level of Education	SSC	14	5.9
	HSC	20	8.4
	Bachelor	114	48.1
	Master	89	37.6
Age	Less than 20	12	5.1
	20–30	69	29.1
	31–40	88	37.1
	More than 40	68	28.7
Marital Status	Single	64	27.0
	Married	173	73.0
Gender	Male	149	62.9
	Female	88	37.1
Type of Company	LEED Certified	79	33.3
	Not Certified by LEED	158	66.7
Position	Chairman/MD/Vice Chairman/DMD/CEO/COO/Director	15	6.3
	GM/Managers/Executive Officer	137	57.8
	In charge/ Line Chief/Supervisor	61	25.7
	Operator/ Assistant Operator/Labor	24	10.1

DOI: 10.53461/jujbr.v25i02.109

Category		Frequency	Percentage (%)
Experience	5–10 years	114	48.1
	11–15 years	72	30.4
	16–20 years	31	13.1
	More than 20 years	20	8.4

Source: Authors Developed

The data show that most of the people who answered the survey (48.1%) have bachelor's degrees, and 37.6% have master's degrees. Prior research indicates that education significantly influences employees' comprehension of organizational practices, commitment, and adaptability to sustainability initiatives (Paillé et al., 2014; Jabbour, 2011). The high level of education in this group shows that the people who answered the questions have the knowledge they need to understand and support GHRM practices. Most of the employees are between the ages of 31 and 40 (37.1%), followed by those between the ages of 20 and 30 (29.1%) and those over the age of 40 (28.7%).

This indicates that the majority of the sample comprises early to mid-career professionals, corroborating previous studies that link younger workforces to enhanced adaptability and receptiveness to organizational change, including sustainability initiatives (Albrecht et al., 2015; Guerci et al., 2016). Adding senior staff to the dataset makes it better because longer tenure is often linked to more commitment and embeddedness in the organization (Ng & Feldman, 2010). The gender distribution (62.9% male and 37.1% female) reflects a male-dominated workforce, aligning with the industrial backdrop prevalent in several developing economies. The significant involvement of women indicates a growing inclusivity and diversity within organizational environments, which has been demonstrated to enhance innovation and engagement (Ali, et al., 2015).

Concerning organizational type, two-thirds (66.7%) of respondents were employed by non-LEED certified enterprises, whilst one-third (33.3%) were affiliated with LEED-certified organizations. This version guarantees representation from both traditional and sustainability-focused enterprises. Previous research indicates that employees at firms with environmental certifications often demonstrate more involvement and alignment with green HRM practices (Renwick, 2013; Guerci et al., 2016). The distribution of roles indicates that the predominant group consists of managers and executives (57.8%), followed by supervisors (25.7%). Middle management is essential, as it is frequently regarded as the primary catalyst for executing HRM strategies and fostering employee engagement (Appelbaum et al., 2000). The inclusion of both frontline personnel and upper management bolsters the credibility of the opinions obtained. The experience profile indicates that over half (48.1%) possess 5–10 years of experience, whereas 30.4% have 11–15 years. This signifies a workforce

DOI: 10.53461/jujbr.v25i02.109

that is both seasoned and comparatively stable, consistent with previous research indicating that employees with middling tenure exhibit higher engagement and lower turnover intentions than those who are either newly hired or nearing retirement (Ng & Feldman, 2010). The demographic attributes of this sample indicate a knowledgeable, diversified, and organizationally integrated workforce, hence enhancing the validity of this study.

5.2 Analysis of Measurement Model (MM)

After running the PLS algorithm with the constructs and their respective indicators, items with insufficient factor loadings (<0.70) were excluded (Wong, 2013). This item purification process follows established PLS-SEM guidelines and does not compromise the conceptual integrity of the constructs. The final model retained four indicators for GT, eight indicators for GWE, and seven indicators for Employee Retention (ER). The detailed loadings, VIF values, and construct-level reliability and validity scores are presented in Table 3.

From Table 3, it is evident that all three constructs demonstrate strong internal consistency and reliability. Cronbach's Alpha values exceeded the recommended threshold of 0.70 for each construct (GT = 0.764; GWE = 0.875; ER = 0.878), indicating reliable scales (Hair et al., 2021). Similarly, Composite Reliability (CR) values were above 0.80 in all cases (GT = 0.849; GWE = 0.903; ER = 0.905), further supporting construct reliability.

Convergent validity was also established, as all Average Variance Extracted (AVE) values exceeded the cut-off of 0.50 (GT = 0.585; GWE = 0.572; ER = 0.577), suggesting that the retained indicators sufficiently explain their respective constructs (Fornell & Larcker, 1981). At the indicator level, factor loadings were consistently above 0.70 (ranging from 0.713 to 0.793 for GT, from 0.713 to 0.787 for GWE, and from 0.721 to 0.783 for ER), except for a few marginally lower values (e.g., ER7 = 0.721; GWE4 = 0.713). Since these items were conceptually important and their inclusion did not compromise the model's overall validity, they were retained**.** This decision aligns with prior PLS-SEM research recommending retention of theoretically meaningful indicators when reliability and validity thresholds are satisfied (Hair et al., 2021).

Multicollinearity was not an issue. All outer-model VIF values fell between 1.379 and 1.987, well below the critical threshold of 5 (Hair et al., 2021). Inner-model VIF values for the paths (GT → ER, GT → GWE, GWE → ER) also remained low (≤ 1.517), confirming that collinearity does not bias the regression estimates.

In summary, Table 3 demonstrates that the measurement model meets the criteria for reliability, convergent validity, and absence of multicollinearity, allowing us to proceed confidently to the assessment of discriminant validity and the structural model.

DOI: 10.53461/jujbr.v25i02.109

Table 3. Factor loadings, reliability, convergent validity, and VIF analysis

Construct / Indicator	Factor Loading	VIF	Cronbach's α	CR (ρc)	AVE
Green Training (GT)			0.764	0.849	0.585
GT1	0.793	1.595			
GT2	0.771	1.547			
GT3	0.753	1.401			
GT6	0.741	1.379			
Green Work Engagement (GWE)			0.875	0.903	0.572
GWE1	0.787	1.987			
GWE2	0.748	1.823			
GWE3	0.775	1.808			
GWE4	0.713	1.592			
GWE6	0.757	1.902			
GWE7	0.746	1.848			
GWE8	0.763	1.875			
Employee Retention (ER)			0.878	0.905	0.577
ER1	0.774	1.851			
ER2	0.783	1.984			
ER4	0.765	1.824			
ER5	0.775	1.932			
ER6	0.752	1.759			
ER7	0.721	1.708			
ER10	0.743	1.742			

Notes: Factor loadings, Cronbach's α, Composite Reliability (CR), and Average Variance Extracted (AVE) were assessed following recommended thresholds (Hair et al., 2021; Fornell & Larcker, 1981). Items with factor loadings below 0.70 were considered for removal (Wong, 2013). Variance Inflation Factor (VIF) values below 5 confirm the absence of multicollinearity (Hair et al., 2021).

5.3 Discriminant Validity — Table 4 & Table 5

To establish discriminant validity, the Fornell–Larcker criterion (1981), the HTMT ratio, and cross-loadings were assessed. Table 4 presents the Fornell–Larcker criterion, where the square root of AVE for each construct is shown along the diagonal. These diagonal values are higher than the corresponding inter-construct correlations in the rows and columns. For example, the square root of AVE for Employee Retention (ER) is 0.759, which is greater than its correlations with GT (0.597) and GWE (0.657). Similarly, the square roots of AVE for GT (0.765) and GWE (0.756) are larger than their respective inter-construct correlations. These results confirm that each construct is distinct from the others.

DOI: 10.53461/jujbr.v25i02.109

Table 4. Discriminant validity analysis (Fornell–Larcker criterion)

Construct	ER	GT	GWE
ER	0.759		
GT	0.597	0.765	
GWE	0.657	0.584	0.756

Table 5 provides the HTMT ratios. All HTMT values were below the conservative threshold of 0.90 (Henseler et al., 2015), with ER–GT = 0.725, ER–GWE = 0.743, and GT–GWE = 0.709. This supports discriminant validity. Taken together, the Fornell–Larcker criterion, HTMT ratio, and cross-loadings provide robust evidence that the constructs of GT, GWE, and ER is empirically distinct.

Table 5. Discriminant validity analysis (HTMT ratio)

Construct	ER	GT	GWE
ER	—	0.725	0.743
GT	—	—	0.709
GWE	—	—	—

Notes*:* The Fornell–Larcker criterion requires the square root of AVE to exceed inter-construct correlations (Fornell & Larcker, 1981). The HTMT ratio should remain below 0.90 to confirm discriminant validity (Henseler et al., 2015).

5.4 Assessing the Structural Model

After verifying the measurement model's reliability and validity, the structural model was examined using SMART PLS 4.0 with bootstrapping. A total of 5,000 sub-samples were used to generate standard errors, t-values, and p-values. The acceptance or rejection of each hypothesis was determined by assessing these values for each proposed path. This procedure ensures rigorous hypothesis testing consistent with contemporary SEM best practices**.** The results demonstrate that H1 is supported, i.e., GT is positively associated with Employee Retention (ER) ($\beta = 0.323$, $t = 2.863$, $p < 0.05$). Similarly, H2 is supported, showing that GT is positively associated with GWE ($\beta = 0.584$, $t = 7.173$, $p < 0.05$). Finally, H3 is also supported, confirming that GWE is positively associated with ER ($\beta = 0.468$, $t = 4.267$, $p < 0.05$).

Table 6. Hypotheses testing.

Paths	Path Coefficient (β)	t-Statistics	p-Values	Status
H1: GT → ER	0.323	2.863	0.004	Accepted
H2: GT → GWE	0.584	7.173	0.000	Accepted
H3: GWE → ER	0.468	4.267	0.000	Accepted

Notes*:* Path coefficients, t-values, and p-values were obtained at the 5% significance level via SmartPLS bootstrapping with 5,000 sub-samples (Hair et al., 2021; Wong, 2013).

DOI: 10.53461/jujbr.v25i02.109

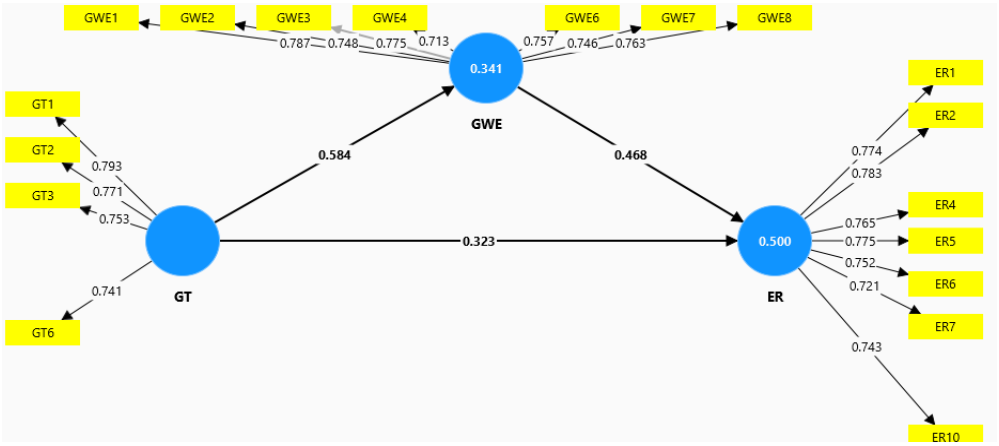

Figure 2. Final output model. (Source: Results from Data Analysis)

5.5 Mediation Analysis

The study further investigated how GWE mediates the relationship between GT and Employee Retention (ER) (H4). The results of the mediation analysis are presented in Table 7.

The findings reveal that GT has a significant total effect on ER ($\beta = 0.596$). Considering the direct effect, GT also shows a significant positive relationship with ER ($\beta = 0.323$, $t = 2.863$, $p < 0.05$). Lastly, GWE demonstrates a significant indirect effect between GT and ER ($\beta = 0.273$, $t = 3.466$, $p = 0.001$), confirming its mediating role. Since both the direct and indirect paths are significant, the results indicate that GWE partially mediates the relationship between GT and ER. Therefore, H4 is supported. This directly provides clarity and empirical verification of the mediating mechanism.

Table 7. Mediation analysis.

Effect Type	Path	Path Coefficient (β)	t-Statistics	p-Values	Mediation Status
Total Effect	GT → ER	0.596	6.578	0.000	Significant
Direct Effect	GT → ER	0.323	2.863	0.004	Significant
Indirect Effect	GT→ GWE→ ER	0.273	3.466	0.001	Partial Mediation (Accepted)

Notes**:** Mediation was tested using bootstrapping procedures, following guidelines in Hair et al. (2021). Significance of the indirect effect was confirmed as the bias-corrected confidence interval did not include zero (Hair et al., 2021). Since both direct and indirect effects were significant, mediation is partial.

DOI: 10.53461/jujbr.v25i02.109

5.6 Discussion of the Hypotheses

H1: GT → ER

Results indicate that GT has a significantly positive effect on ER ($\beta = 0.597$, $p < 0.001$). This is in line with the true spirit of Social Exchange Theory (Blau, 1964), which shows that to the extent that employees feel valued due to an investment from an organization (e.g., through shared training), the more they will reciprocate with loyalty and retention. Training provides continued organizational concern for employees, which enhances job satisfaction and reduces turnover (Jabbour, 2011). Previous studies also indicate that training, as a green HRM practice, enhances employees' commitment and reduces turnover (Guerci, Longoni, & Luzzini, 2016).

H2: GT → GWE

In the study, GT was indeed found to be a significant positive predictor of GWE ($\beta GT = 0.584$; $p < 0.001$). This lends credence to the ability-motivation-opportunity (AMO) framework (Appelbaum et al., 2000), which posits that HRM practices enhance employees' ability (A), increase their motivation (M), and provide them opportunities (O) to perform well at work. GT equips employees with the knowledge and competencies they need, but it also encourages them to develop eco-friendly practices. Previous studies support this relation: Saks (2006) showed that training contributes to work engagement through psychological empowerment, and Paillé et al. The (2014) study shows that by enhancing the implementation of green HRM activities, the employees' level of environmental involvement and participation is enabled to grow.

H3: GWE → ER

The findings validated that GWE had a beneficial effect on ER ($\beta = 0.468$, $p < 0.001$). This aligns with the research of Schaufeli and Bakker (2004), who posited that engaged employees demonstrate greater organizational commitment and are less inclined to go. Engagement, characterized by vigor, dedication, and absorption (Schaufeli et al., 2002), serves as a psychological buffer against turnover intentions. Albrecht et al. (2015) further asserted that engaged employees experience a heightened alignment with the organization, which directly improves retention outcomes. Thus, GWE emerges as a critical psychological mechanism linking green HRM practices to employee retention outcomes.

H4: Mediation (GT → GWE → ER)

The mediation analysis indicated that GWE partially mediates the association between GT and ER ($\beta = 0.273$, $p = 0.001$). This indicates that GT affects ER both directly by improving abilities and indirectly by promoting participation. The partial mediation corroborates previous findings by Paillé et al. (2014), who identified that involvement mediates the connection between HRM practices and sustainability outcomes. This aligns with Hair et al. (2021), who propose that partial mediation underscores the existence of many pathways connecting HRM practices to organizational results.

DOI: 10.53461/jujbr.v25i02.109

5.7 Theoretical Implications

This research offers multiple theoretical contributions. This research enhances Green HRM literature by demonstrating that GT affects retention not only directly but also indirectly through engagement, thus unifying the fields of human resource development and sustainability. By empirically validating this mechanism within a labor-intensive manufacturing context, the study extends the applicability of Green HRM theory to emerging-economy industries. Secondly, it corroborates the Social Exchange Theory by illustrating that employees react favorably to corporate investment in environmental training. Third, utilizing the AMO framework, this study demonstrates how HRM approaches can concurrently augment ability, motivation, and opportunity to boost retention.

5.8 Practical Implications

The findings have implications for management practices. While organized GT programs directly contribute to employee retention, they also indirectly contribute to green workplace engagement. This implication is particularly relevant for garment-sector organizations facing high employee turnover and increasing sustainability compliance pressures. Second, training design should include motivational elements in addition to training in technical competencies, e.g., working toward purpose, environmental engagement, and recognition of pro-environmental behaviours. Third, as engagement has a tremendous impact on retention, managers should create an enabling environment that fosters employee engagement in sustainability practices. In the end, GT as part of a holistic HRM strategy can improve corporate reputation and recruit personnel with a sustainability-oriented mindset, which in turn, will strengthen long-term retention as well (Renwick, 2013).

Table 8. Summary of Findings, Literature Links, and Implications

Finding	Literature Link	Implication
H1: GT → ER ($\beta = 0.597$, $p < 0.001$) GT has a significant positive effect on Employee Retention.	Consistent with Social Exchange Theory (Blau, 1964), employees reciprocate organizational investment in training with loyalty.supported by Jabbour (2011) and Guerci et al. (2016), who found that green HRM practices enhance retention. This evidence confirms the relevance of GT as a retention mechanism in sustainability-driven industries.	Organizations should invest in structured GT programs to directly improve retention by signaling commitment to employee development and sustainability.
H2: GT → GWE ($\beta = 0.584$, $p < 0.001$) GT strongly enhances Green Work Engagement.	Training enhances ability, motivation, and opportunity (AMO theory, Appelbaum et al., 2000). Saks (2006) and Albrecht et al. (2015) show that training increases engagement by building purpose and capability. Paillé et al. (2014) emphasize the role of green HRM in fostering engagement with sustainability practices. This highlights engagement as a central psychological outcome of GT interventions.	GT should be designed not only for skills but also to inspire purpose, enthusiasm, and commitment to sustainability, thus fostering engagement.
H3: GWE → ER ($\beta = 0.468$, $p < 0.001$) Green Work	Engagement is linked to lower turnover and higher commitment (Schaufeli & Bakker, 2004; Saks, 2006). Albrecht et al. (2015) stress that engaged employees	Managers should foster engagement initiatives (recognition, teamwork,

DOI: 10.53461/jujbr.v25i02.109

Finding	Literature Link	Implication
Engagement significantly predicts Employee Retention.	remain with organizations longer. This finding reinforces engagement as a critical retention lever across organizational contexts.	purpose-driven tasks) to keep employees motivated and loyal.
H4: GT → GWE → ER ($\beta = 0.273$, $p = 0.001$) GWE partially mediates the relationship between GT and ER.	Partial mediation confirms dual impact: direct and indirect (Hair et al., 2021). Paillé et al. (2014) found engagement mediates HRM practices and environmental performance outcomes**.** This directly addresses a clearer articulation of the mediating mechanism.	Organizations should integrate GT with engagement programs to maximize retention outcomes. Engagement acts as the psychological pathway linking training to retention.

6. Limitations and Future Research Directions

While this study offers significant insights into the role of GT in improving employee retention via green work engagement, several limitations must be recognized.

First, the study used a cross-sectional design, which makes it hard to draw strong conclusions about cause and effect. The findings indicate substantial direct and indirect relationships; however, engagement and retention are dynamic constructs that may change over time. Subsequent research ought to utilize longitudinal or experimental methodologies to elucidate the progression of the effects of GT and to determine if engagement maintains its mediating function over time (Suleman, Syed, & Mahmood, 2023; Han & Kok, 2023).

Second, the data were gathered from a singular national context (Bangladesh) and confined to specific industries. While this offers depth and contextual significance, cultural and institutional influences may affect employees' perceptions of green HRM practices. To determine the generalizability of these findings, comparative studies across various countries and sectors are essential (Renwick, 2013).

Third, the study concentrated solely on GWE as the mediating variable. However, other attitudinal variables, including job satisfaction, organizational commitment, green organizational climate, and empowerment, may also elucidate the GT–ER relationship (Paillé, et al., 2014; Hassanein et al., 2024). Subsequent research may employ a multi-mediator or serial mediation framework to more effectively elucidate the psychological mechanisms by which GT influences retention.

Fourth, the dependence on self-reported survey data may result in common method bias and social desirability effects. Even though statistical fixes were used, future research might benefit from using data from more than one source (like supervisor evaluations or HR retention records) or a mix of methods to confirm results (Hair et al., 2021).

Lastly, the study did not examine possible moderating variables that could enhance or diminish the identified relationships. Green organizational culture,

DOI: 10.53461/jujbr.v25i02.109

leadership style, generational differences, and LEED certification status may influence the degree to which GT results in engagement and retention (Guerci, et al., 2016; Judeh & Khader, 2023). Subsequent research ought to examine these moderators to enhance theoretical comprehension and inform context-specific human resource management strategies. In conclusion, this study validates the dual mechanism by which GT improves retention—both directly and indirectly through engagement—while also presenting multiple opportunities for future research. Longitudinal, cross-cultural, and multi-mediator studies, along with a broader array of data sources and moderator analyses, will be essential in enhancing both theoretical and practical comprehension of the role of green HRM practices in sustainable workforce management.

7. Conclusion and Recommendations

As companies deal with global sustainability issues and pressures on their workers, it has become more important for them to include GT in their daily activities. GT not only teaches employees about the environment, but it also makes them more loyal to the company and less likely to leave (Jabbour, 2011; Al-Hajri, 2020), signifies commitment, promotes reciprocity, and enhances retention (Blau, 1964; Guerci, et al., 2016). An increasing number of research also emphasizes the mediating function of GWE in elucidating the mechanism through which GT leads to favorable employee outcomes. Engagement, defined by vigor, dedication, and immersion in environmentally-related tasks, links training to long-term workforce stability by augmenting employees' sense of purpose and alignment with organizational values (Aboramadan, 2020). The Job Demands–Resources model and the Ability–Motivation–Opportunity framework say that well-designed training programs can be both resources and motivators, which can help keep employees (Saks, 2006). This research underscores the increasing acknowledgment that sustainability-oriented HR practices are not only advantageous for the environment but also crucial for organizational competitiveness and employee engagement (Suleman, et al., 2023). Accordingly, the findings provide actionable insights for both manufacturing and service-sector organizations seeking to align sustainability initiatives with long-term human capital strategies.

8. Recommendations

8.1 For Practice

Make green training a strategic investment - Companies should create GT programs that focus on both environmental skills and employee development. This shows a long-term commitment and encourages loyalty (Al-Hajri, 2020). This recommendation is particularly relevant for labor-intensive industries such as the garment sector, where employee turnover remains a persistent challenge.

Encourage participation by providing useful training – Value focused and goal focused GT should be set up in the organization. So the employees feel energized and dedicated to their work (Aboramadan, 2020; Saks, 2006). Such

DOI: 10.53461/jujbr.v25i02.109

engagement-oriented training designs strengthen the mediating role of GWE identified in this study.

Implement a comprehensive green HRM system - Combining GT with other eco-friendly practices, like eco-friendly hiring, evaluation, and reward systems, creates synergies that improve engagement and retention (Guerci, Longoni, & Luzzini, 2016; Tang et al., 2018). An integrated approach ensures that GT is reinforced through consistent HRM signals rather than operating in isolation.

Make leadership and culture stronger - Managers should set an example by acting in ways that are good for the environment and encourage others to do the same. This is because leadership commitment makes training more effective at keeping employees (Renwick, 2013; Judeh & Khader, 2023**).** This is especially important in organizations transitioning toward formal sustainability standards, such as LEED certification.

Look at how well the training worked - To make sure that GT outcomes are in line with the goals of the organization and the workforce, they should be checked regularly through surveys, retention indicators, and employee feedback (Hair et al., 2021). Continuous evaluation allows organizations to refine GT strategies and sustain engagement-driven retention benefits over time.

8.2 For Research

Investigate supplementary mediators - There may be other factors at work with GWE, like job satisfaction, organizational commitment, and empowerment, that should be looked at in multi-mediator models (Paillé, Chen, Boiral, & Jin, 2014; Hassanein, et al., 2024**).** Such extensions would deepen understanding of the psychological mechanisms underlying green HRM practices.

Look at the moderators - Factors like an organization's green culture, differences between generations, and certification standards (like LEED) could make it easier to understand boundary conditions (Guerci et al., 2016). This would help distinguish between direct and indirect beneficiaries of green HRM initiatives.

Use longitudinal designs - Longitudinal studies are necessary to evaluate the durability of gamification effects on engagement and retention (Han & Kok, 2023). Such designs would also strengthen causal inference, addressing a key methodological limitation noted by the reviewer.

References

Albrecht, S. L., Bakker, A. B., Gruman, J. A., Macey, W. H., & Saks, A. M. (2015). Employee engagement, human resource management practices, and competitive advantage: An integrated approach. *Journal of Organizational Effectiveness: People and Performance, 2*(1), 7–35. https://doi.org/10.1108/JOEPP-08-2014-0042

Aboramadan, M. (2020). The effect of green HRM on employee green behaviors in higher education: The mediating mechanism of green work engagement.

International Journal of Organizational Analysis. https://doi.org/10.1108/IJOA-05-2020-2190

Abdou, A., Al Abdulathim, M. A., Hasan, N. R. H., Salah, M. H. A., Ali, H. S. A. M., & Kamel, N. J. (2023). From green inclusive leadership to green organizational citizenship: Exploring the mediating role of green work engagement and green organizational identification in the hotel industry context. *Sustainability, 15*(20), 14979.

Ali, M., Metz, I., & Kulik, C. T. (2015). The impact of gender diversity on performance in services and manufacturing organizations. *International Journal of Human Resource Management, 26*(6), 893–915. https://doi.org/10.1080/09585192.2011.561961

Al-Hajri, S. (2020). Employee retention in light of green HRM practices through the intervening role of work engagement. *Academy of Contemporary Management and HR Review*. https://doi.org/10.33166/ACDMHR.2020.04.002

Alshaabani, A., Naz, F., & Rudnák, I. (2021). Impact of green human resources practices on green work engagement in the renewable energy departments. *International Business Research, 14*(6), 44–55. https://doi.org/10.5539/ibr.v14n6p44

Alhemimah, A., Baquero, A., Al-Romeedy, B. S., & Khairy, H. A. (2024). Green organizational learning and sustainable work behavior in tourism and hotel enterprises: Leveraging green intrinsic motivation and green training. *Geo Journal of Tourism and Geosites*. https://doi.org/10.30892/gtg.55314-1286

Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. L. (2000). *Manufacturing advantage: Why high-performance work systems pay off*. Cornell University Press.

Bahizire, G. M., & Pea-Assounga, J. B. B. (2024). Enhancing employee green performance through green training: The mediating influence of organizational green culture and work ethic in the mining sector. *Journal of Cleaner Production*.

Blau, P. M. (1964). *Exchange and power in social life*. Wiley.

Dumont, J., Shen, J., & Deng, X. (2017). Green human resource management and employee workplace green behavior: The role of green values and perceived organizational support. *Human Resource Management, 56*(4), 613–627.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Guerci, M., Longoni, A., & Luzzini, D. (2016). Translating stakeholder pressures into environmental performance: The mediating role of green HRM practices. *International Journal of Human Resource Management, 27*(2), 262–289.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer. https://doi.org/10.1007/978-3-030-80519-7

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135.

Haque, M. M., Islam, A., & Soh, S. (2024). Green HRM practices and green work engagement: The roles of green knowledge sharing and green group cohesion. *Global Business and Organizational Excellence*. https://doi.org/10.1002/joe.22266

DOI: 10.53461/jujbr.v25i02.109

Han, J. W., & Kok, S. K. (2023). The impact of green training on employee turnover intention and customer satisfaction: An integrated perspective. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.2534

Hani, N. A., & Praningrum, P. (2023). Green human resource management on green behavior mediated by green work engagement among Rejang Lebong Hospital. *Jurnal Ilmu Manajemen Advantage, 7*(2), 208–222.

Hassanein, F. R., Elshaer, I. A., & Azazz, A. M. (2024). Green human resource management and employee retention in the hotel industry: The mediating effect of green innovation. *Preprints*. https://doi.org/10.20944/preprints202402.0833.v1

Huo, X., Azhar, A., Rehman, N., & Majeed, N. (2022). The role of green human resource management practices in driving green performance in manufacturing SMEs. *Sustainability, 14*(24), 16776. https://doi.org/10.3390/su142416776

Islam, M. A., Mendy, J., Haque, A. K. M. A., & Rahman, M. (2022). Green human resource management practices and millennial employees' retention in SMEs: The moderating role of creativity climate. *Business Strategy and Development*.

Jabbour, C. J. C. (2011). How green are HRM practices in organizations? A review of the evidence. *International Journal of Human Resource Management, 22*(7), 1335–1370.

Judeh, M., & Khader, J. A. (2023). Green training and development and job delight as determinants of green employee behavior and employee retention. *International Journal of Sustainable Development and Planning, 18*(1), 221–228.

Kundu, S. C., & Gahlawat, N. (2016). Effects of employee retention strategies on organizational performance. *International Journal of Business Administration*.

Minjoon, J., Cai, S., & Shin, H. (2006). Employee retention and organizational commitment. *International Journal of Human Resource Management*.

Ng, T. W. H., & Feldman, D. C. (2010). The relationships of age with job attitudes: A meta-analysis. *Personnel Psychology, 63*(3), 677–718.

Paillé, P., Chen, Y., Boiral, O., & Jin, J. (2014). The impact of human resource management on environmental performance: An employee-level study. *Journal of Business Ethics, 121*(3), 451–466.

Renwick, D. W., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. *International Journal of Management Reviews, 15*(1), 1–14.

Saks, A. M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology, 21*(7), 600–619.

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement, 66*(4), 701–716.

Tang, G., Chen, Y., Jiang, Y., Paillé, P., & Jia, J. (2018). Green human resource management practices: Scale development and validity. *Asia Pacific Journal of Human Resources, 56*(1), 31–55.

Wong, K. K. K. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin, 24*(1), 1–32.

DOI: 10.53461/jujbr.v25i02.109

Appendix A. Measurement Instrument

Table A1. Measurement Instruments

Construct	Item Code	Measurement Item	Source
Green Training (GT)	GT1	The firm develops training programs in environmental management to increase the environmental awareness, skills, and expertise of the employees.	Dumont et al., (2017), Islam et al., (2020)
	GT2	The firm provides integrated training to foster employees' emotional commitment to environmental management.	Tang et al., (2018)
	GT3	Contents of GT are raised through a systematic analysis of training gaps and needs.	Tang et al., (2018)
	GT4	Environmental training is a priority when compared to other types of company training.	Dumont et al., (2017)
	GT5	The responsibilities and duties of official green trainers are precisely defined.	Jabbour (2011)
	GT6	There is an adequate infrastructure (physical space, material, and people) for the delivery of GT.	Tang et al. (2018)
	GT7	There are adequate assessments of employees' performance after attending GT sessions.	Dumont et al., (2017)
Green Work Engagement (GWE)	GWE1	I understand the concept of Green HRM practices, and I am aware of them.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE2	I welcome Green HRM concepts and practices in the organization.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE3	I feel happy when I am working intensely in a green environment.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE4	My environment-related tasks inspire me.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE5	I am proud of the environmental work that I do.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE6	I am fully engaged in my environmental work.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE7	I am enthusiastic about my environmental tasks at my job.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)

DOI: 10.53461/jujbr.v25i02.109

Construct	Item Code	Measurement Item	Source
	GWE8	I feel bursting with energy in my environmental tasks.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
	GWE9	I find my work full of meaning and purpose.	Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006)
Employee Retention (ER)	ER1	In order to support this company's success, I'm willing to work far harder than is often required.	Minjoon, J., Cai, S., & Shin, H. (2006)
	ER2	I feel a lot of loyalty to this company.	Minjoon, J., Cai, S., & Shin, H. (2006)
	ER3	If I wanted to do another job or function, I would look first at the possibilities within this company.	Minjoon, J., Cai, S., & Shin, H. (2006)
	ER4	I would recommend this company to a friend if he/she is looking for a job.	Eric Ng Chee Hong et al.,2012.
	ER5	I am satisfied with the greenery initiatives of my organization and intend to stay here in the long run.	Eric Ng Chee Hong et al.,2012.
	ER6	I am happy and comfortable with my environmental work in this organization.	Eric Ng Chee Hong et al.,2012.
	ER7	I have no intention to leave the company soon.	Minjoon, J., Cai, S., & Shin, H. (2006)
	ER8	I see a future for myself within this company.	Minjoon, J., Cai, S., & Shin, H. (2006)
	ER9	I think I will never leave this firm.	Minjoon, J., Cai, S., & Shin, H. (2006)
	ER10	This is the best garments company for me to work with.	Context-adapted from Kundu & Gahlawat (2016)

Note: All items were measured using a 5-point Likert scale ranging from 1 = “Strongly Disagree” to 5 = “Strongly Agree”. The items were adapted from established scales in prior Green HRM, employee engagement, and retention literature and contextualized for the Bangladeshi garment industry.

DOI: 10.53461/jujbr.v25i02.109