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**Examining the Interaction of Green Working Engagement for explaining the Eco-friendly empowerment of Employees by Green HRM.**

**A study on higher education sector of Pakistan using SEM**

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**Abstract**

*The present study was aimed to examine the mediation effect of green work engagement in the relationship of green HRM practices and eco-friendly employee empowerment in the higher education sector of Pakistan. For achieving these objective, the data was collected from 368 respondents using convenience sampling approach through online means from the employees serving in the chartered universities in the major cities of Pakistan. The exogenous variable was green HRM practices, while the endogenous variable was eco-friendly employee empowerment and the mediating variable was green work engagement. The initial analysis using SPSS and Smart PLS of the data revealed that all the factors along-with their constructs were internally and externally reliable and valid by meeting the threshold level. The structural equation modelling revealed that all the hypothesis was accepted and the SEM estimation concluded that there is a strong mediating effect of green work engagement in the relationship of green HRM and eco-friendly employee empowerment. The managerial implications of the study are that the policymakers and management of higher education sector of Pakistan can boost the eco-friendly*

*empowerment of their employees by carefully considering the green practices of HRM and green work engagement of their employees. The findings of the study are applicable to the education/higher education sector of other regions but no other sector due to the distinct nature of targeted population. The future research may include the other factors of green management like csr or cg for examining their impact in the eco-friendly employee empowerment for the higher education sector of Pakistan.*

**Keywords:** Green HRM, Green work Engagement, Green Employee empowerment, Higher education, Pakistan.

## Introduction

### Background of Study

The word "green HRM" has been most widely used to describe how HR policies as well as activities relate to a company's overall environmental agenda (Muster & Schrader, 2011). It is referred to as enlisting the help of any employee to promote sustainable practices and raise employee involvement and participation to the matter (Mandip, 2012). It also described that the Green HR is environmentally friendly HR practices that lead to improved efficiencies, lower costs, and higher levels of employee participation (D. W. Renwick, Redman, & Maguire, 2013). Individuals who are loyal to clients, staff, and the community are recruited by the HR department (Torp, Grimsmo, Hagen, Duran, & Budbergsson, 2012). Employees are praised for achieving environmental objectives, such as lowering waste including reducing energy consumption (Ugwu, Onyishi, & Rodríguez-Sa'nchez, 2014). Employees incorporate the company's environmental principles into their daily affairs through carpooling or biking to work, volunteering in the neighbourhood, and bringing their breakfast and lunch at home, among other things (Kimberley & Bakker, 2015). Sales representatives are aware of the business's goods or services' social and environmental consequences (Lee & Chihyung, 2015). They often use features to drive their company's goods or services apart from those of rivals. Front-line employees are constantly looking for ways to save resources and water (Sharma & Gupta, 2015). Workers make strategic choices based about what is "a best thing to be doing," not just on profitability (Hosain & Rahman, 2016). Employees participate in neighbourhood programmes including park improving the appearance and fundraising events (Karadas, 2016). When introducing alternative vendors, buying managers run automated tests to see whether the goods meet the corporation's environmental and ethical requirements (D. W. S. Renwick, Jabbour, Muller-Camen, Wilkinson, & Redman, 2016). The chief (or some other senior staff member) is in charge through industry-wide initiatives to enhance the market's environmental and/or economic impact (Tariq, Jan, & Ahmad, 2016). The organisations understood that they needed to change their normal business practises or culture of the organization in order to protect existing employees and the ecosystem (Dumont, Shen, & Deng, 2017). Such business practises should be environmentally friendly and therefore have no detrimental consequences for the environment or community (Mishra, 2017). Individuals set environmental sustainability goals in accordance with their organizational objectives in order to minimize the level of environmental exploitation (Aktar & Islam, 2019). The HRM team plays a vital role in achieving the institution's environmental management objectives (Alzgool, 2019). Green HR initiatives have been a feature within HRM

in several organisations around the world, and addition to conventional CSR practices (Gilal, Ashraf, Gilal, Gilal, & Channa, 2019). The economy of Pakistan is continually evolving from environmental degradation towards eco-friendly business practices that requires the higher educational institutes to play their role by educating the future businessman, industrialist, engineers, bankers, etc. This definitely add value for the society on behalf of higher education sector of Pakistan to promote green HRM in their employees as well as students.

### **Research Problem**

Although many environmental concerns have arisen in recent decades, the governments of numerous countries have guided companies and organizations to concentrate through an environment protection programs in addition to existing business activities (Jyoti, 2019). As a result of the vast environmental degradation that continues to destroy our environment, governments around the world have adopted numerous environmental protection policies, forcing companies and businesses to integrate such policies into their business processes in order to meet long-term environmental sustainability. The higher education sector can play an important part by educating its employees as well as students to how to adopt the green HRM policies to benefit the overall society at large. The students are the future industrialist, bankers, engineers, and other professionals who are to joint their professional life afterwards. They need to understand the importance of green HRM concept in order to apply it in their practical life, other environmental degradation will continue in the absence of green HRM.

### **Research Objectives**

The present research is aimed to examine the mediating impact of green work engagement in the relationship of green HRM practices and eco-friendly empowerment of employees in the higher education sector of Pakistan. The specific research aims and objective as par the requirements of the study are as follows.

- 1: To investigate the role of green HRM practices on the eco-friendly empowerment of employees working in the higher education sector of Pakistan.
- 2: To examine the impact of green HRM practices of higher education sector of Pakistan on green work engagement.
- 3: To explore the role of green work engagement to determine the eco-friendly empowerment of employees in the higher education sector of Pakistan.
- 4: To test the mediating impact of green work engagement as the mediation between green HRM practices and eco-friendly empowerment of employees in the higher education sector of Pakistan.

### **Research Questions**

The present research study required to achieve its general as well as specific research aims through the following research questions.

- 1: How green HRM practices impact the eco-friendly empowerment of employees in the higher education sector of Pakistan?
- 2: What is the impact of green HRM practices on the green work engagement in the higher education sector of Pakistan?

**3:** Do the green work engagement also impact the eco-friendly empowerment of employees in the higher education sector of Pakistan?

**4:** Does the green work engagement significantly mediates the relationship between green HRM practices and eco-friendly empowerment of employees?

### **Significance of the study**

Green HRM is a relatively recent term that is being followed by an increasing number of companies. Many organizations around the world already implemented Green HRM practices as component of their HRM approach, in addition to conventional CSR initiatives, to educate employees about their environmental obligations. In community and the climate, the institution of higher learning plays a unique role. Several educational institutions have developed green programs to assist students and workers in protecting the environment, but it is impossible to fully enforce green HRM policies. By considering the Green HRM and employee green engagement in educational institutions, this should benefit the university education institution because it would be important for global conservation.

### **Literature Review**

The review of literature for the present research study comprises of conceptual review, theoretical review and critical literature review along-with research gap and theoretical framework. Each of these is described in detail under their separate segment for this purpose.

### **Conceptual Review**

The conceptual review of the past study in support of three concepts; green HRM, green employee empowerment, and green work engagement is provided under their relevant headings as follows.

### **Green HRM**

GHRM is a relatively new term that is gaining popularity around the world (Kim, Kim, Choi, & Phetvaroon, 2019). For different groups of people, it means something entirely different (Ojo & Raman, 2019). GHRM does not have a systematic meaning. It consists of making measures to boost fuel efficiency or lower emission levels in our homes, businesses, and daily lives (Saeed et al., 2019). The primary aim for going green should be to minimize the environmental effects that energy use and emissions can have (Azadeh. Shafaei, Nejati, & Yusoff, 2019). It is known as the combination of environmental and HRM (Zaki & Norazman, 2019). Greenish activities include video recruitment including the usage of virtual or video surveys to meet current and future requirements (Zhang, Luo, Zhang, & Zhao, 2019). E - filing, automobile, employment, videoconferencing, and virtual conferences, recycling, teleworking, and professional development are examples of environmentally sustainable HR programmes that result in higher efficiencies, reduced prices, and improved retention of employees, which then in turn allow enterprises minimize employee carbon emissions (Aboramadan, 2020). Green HR programmes assist businesses in finding cost-cutting options without jeopardising their best talent (Al-Ghazali & Afsar, 2020). Stable business practises are encouraged by focusing towards Green Practices as just a strategic approach (Al-Hajri, 2020).

### **Green Employee empowerment**

Green jobs often come to mean any work that has anything to do with sustainability, environmental issues, renewable energies, the environment, or a number of other topics (Anwar et al., 2020). They've now become a symbol of a change in job requirements for those seeking the work that meets a willingness to make a significant difference and involves working that enhances our climate, decreases energy use, and contributes back to the society (Hameed, Khan, Islam, Sheikh, & Naeem, 2020). Employee empowerment has described as the methods by which organisations give their employees some independence and freedom over their daily activities (Karatepe, Rezapouraghdam, & Hassannia, 2020). Which can include getting a say in process development, assisting in the creation and management of new programmes and strategies, and managing smaller teams with fewer supervision from higher-ups (Li et al., 2020). Employee empowerment entails giving workers the tools they need to make critical decisions and assisting them in ensuring those assessments are right (Mukherjee, Bhattacharjee, Paul, & Banerjee, 2020). When fully implemented, this could result in improved efficiency and a higher standard of products and career place for employees (Azadeh Shafaei, Nejati, & Yusoff, 2020).

### **Green Work engagement**

HRM that is environmentally friendly and job participation that is environmentally friendly (Singh, Del Giudice, Chierici, & Graziano, 2020). It may also be described as an optimistic, satisfying, job-related frame of consciousness characterized by vigor, commitment, as well as absorption," according to the research on employee engagement (Ababneh, 2021). Improving employee participation in going green the company will result in a more inspired, profitable, and diverse workforce - something that recognizes each benefits of positive business practices and ethical responsibility (Chemseddine & Kamel, 2021). Employees who are engaged recognize the interconnectedness of financial, ecological, and social problems and feel their company is solving these three issues efficiently (Tariq et al., 2016).

### **Critical Review of Literature**

The critical review of literature considered the findings from the historical literature for examining the relationships between the required set of constructs. These critical findings are discussed under their specific headings in detail.

### **Green HRM practices and Eco-friendly empowerment of employees**

A large proportion of studies examined the strong impact of practices of green HRM for eco-friendly empowerment of employees (Mandip, 2012). Eco-friendly empowerment of employees is the primary objective for many organizations to achieve for adopting green practices (Torp et al., 2012). The green practices of HRM can enhance the eco-friendly empowerment of employees (D. W. Renwick et al., 2013). An optimistic relationship was observed between Green practices of HRM and eco-friendly empowerment of employees in different sectors around the globe in the studies of (Alzgool, 2019; Hameed et al., 2020; Hosain & Rahman, 2016; Jyoti, 2019; Kim et al., 2019; Mishra, 2017; Ojo & Raman, 2019; D. W. S. Renwick et al., 2016; Sharma & Gupta, 2015; Tariq et al., 2016; Zhang et al., 2019). However, some of the studies could not provide the strong link between Green practices of HRM and eco-friendly empowerment of employees by (Li et al., 2020; Azadeh Shafaei et al., 2020; Singh et al., 2020). Based on the large proportion of evidences in support of significant

link between green practices of HRM and eco-friendly empowerment of employees, the following hypothesis is established.

**H<sub>1</sub>:** Green HRM practices significantly affect eco-friendly empowerment of employees in the higher education sector of Pakistan.

#### **Green HRM practices and Green work-engagement**

Green practices of HRM and green engagement of employees literature evidences also supported with the significant link between them (Muster & Schrader, 2011). Green practices of HRM requires an organization to motivate its employees to engage their work activities in green process (Torp et al., 2012). Increasing the level of green practices in organizational HRM strongly boost the green engagement of employees (Ugwu et al., 2014). Similarly, optimistic and strong relationship between green practices of HRM and green engagement of work by employees in different sector around the world were confirmed by the studies of (Karadas, 2016; Kimberley & Bakker, 2015; Lee & Chihyung., 2015; Saeed et al., 2019; Tariq et al., 2016; Zaki & Norazman, 2019). A very little number of studies, however, could not provide the evidence for significant link between green practices of HRM and green engagement of work by employees (Ababneh, 2021; Al-Ghazali & Afsar, 2020; Jyoti, 2019). Based on the large proportion of evidences in support of significant link between the variables, the following 2<sup>nd</sup> hypothesis is establishing to test on the higher education sector of Pakistan.

**H<sub>2</sub>:** Green HRM practices significantly affect green work engagement of employees in the higher education sector of Pakistan.

#### **Green work-engagement and eco-friendly empowerment of employees**

The relationship between green engagement of work by employees and eco-friendly empowerment of employees were found significant by (Dumont et al., 2017; Lee & Chihyung., 2015; Mandip, 2012; D. W. S. Renwick et al., 2016; Ugwu et al., 2014). However, some of the research studies could not found a significant link between both of the variables of the study e.g., (Al-Hajri, 2020; Mishra, 2017; Saeed et al., 2019). Keeping in view the evidence of majority of the studies in the past literature, the following hypothesis is established to test the relationship between green work-engagement and eco-friendly empowerment of employees in the higher education sector of Pakistan.

**H<sub>3</sub>:** Green work engagement of employees in the higher education sector of Pakistan strongly determines their eco-friendly empowerment.

#### **Green work engagement mediation**

Green work engagement have a significant effect as the mediating variable between green HRM practices and environmental performance from employees and their bosses in Pakistan (Hameed et al., 2020). Green work engagement was never used as the mediating variable for testing the relationship between green practices of HRM and eco-friendly employee work engagement in the education setting of Pakistan. Therefore, the study requires the following hypothesis to test.

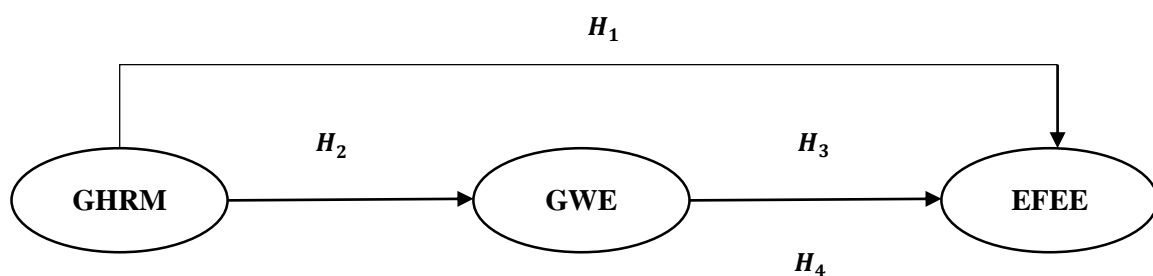
**H<sub>4</sub>:** Green work engagement of employees in the higher education sector of Pakistan strongly mediates the relationship between green HRM practices and eco-friendly empowerment of employees.

### Research Gap

The historical evidences lack the relationship between green HRM practices, eco-friendly employee empowerment with the mediating impact of green engagement of employees in the higher education sector of Pakistan. For example, Aktar and Islam (2019) studied the role of green HRM practices in determining the employee engagement in the manufacturing sector of Bangladesh. Similarly, Aboramadan (2020) studied the impact of green HRM on green behavior of employees in the higher education sector but in the Middle east region. Additionally, Ababneh (2021) considered the same set of relationship on manufacturing sector of Arab world. Therefore, the present research is aimed to examine the mediating effect of green engagement of employees working the higher education sector of Pakistan in relation to green HRM practices and eco-friendly employee empowerment.

### Research Framework

The present study requires to examine the impact of green HRM practices of higher education sector of Pakistan on eco-friendly empowerment of employees with the mediating effect of green work engagement. The theoretical, conceptual and historical findings were effective to establish the following theoretical research model where all relational path along-with the required set of hypothesis were establish in the following figure 1. The first three hypothesis indicated the direct impact while the 4<sup>th</sup> hypothesis indicated the mediation impact of green work engagement between the relationship of green HRM and eco-friendly empowerment of employees.



**Figure 1: Theoretical Framework**

### Research Methodology

The present research study is examined on the basis of quantitative data for green HRM practices and its impact on eco-friendly empowerment of employees in the higher education sector of Pakistan with the mediation effect of green work engagement of employees in the same sector. The population of the study comprises of employees working in the higher education sector of Pakistan which includes the admin employees as well as faculty members serving in the different universities of Pakistan. The unit of analysis of the study comprises of individual university in each major city of Pakistan. It includes all the chartered universities both public and private of higher education commission located in Lahore, Islamabad, Gujrat, Gujranwala, Faisalabad, Multan, Peshawar, Karachi, Rahim-yar-Khan, Bahawalpur, etc.

The present study requires to collect data from employees working in chartered universities of higher education commission. Due to pandemic situation, physical data

collection is avoided and online means of data collection like email, WhatsApp, Facebook, LinkedIn, Instagram, etc., were used which requires to draw the sample based on convenience sampling approach. This approach is feasible due to less cost and time and convenient in terms of accessibility of data and approaching the targeted respondent. As the population of the study is unknown, due to which the sample was selected on the basis of rule of thumb which requires to collect data from more than 350 respondents. Therefore, the questionnaire was shared through the different online means between more than 500 employees serving at different grades in chartered universities of HEC in major cities of Pakistan.

The final data was collected from 392 respondents using a self-administrative questionnaire survey which was distributed by using the online means to the targeted respondents of the study. Out of 392 responses, 24 individual responses were useless due to not responding a large number of statements of different variables. Therefore, 368 responses were considered for the dataset and further analysis to test the hypothesis of the study. The questionnaire was composed of 4 sections; firstly, the demographic details like gender, age, qualification, marital status, and job-experience, secondly the items related to green practices of HRM, thirdly, green empowerment of employees, and finally the green work engagement of employees working the higher education sector of Pakistan. The exogenous variable of the study was green practices of HRM which was measured using 6-items with five-point-Likert scale adopted from the study of (Hameed et al., 2020). Similarly, the endogenous variable of the study was eco-friendly empowerment of employees which was measured using 7-items at the scale of five-point Likert and was adopted from the study of (Singh et al., 2020). Finally, the mediating variable of the study was green engagement of employees which was measured using 9-items with five-point Likert scale adopted from the study of (Hameed et al., 2020; Singh et al., 2020).

The method of estimation includes estimation and reporting of demographic summery for gender, age, qualification, marital status, and job-experience in the form of frequency, percentage, mean, and standard deviation. Additionally, the estimations require to apply confirmatory factor analysis in the form of convergent validity and reliability; factor loading, Cronbach alpha, composite reliability, rho, average variance extracted, discriminant validity, etc. Finally, the estimation required to use structural equation modeling approach to test the hypothesis of direct link as well as mediation impact.

## **Results and Discussion**

The present research study is aimed to examine the impact of Green HRM practices in the higher education sector of Pakistan on their employee's eco-friendly empowerment with the mediation role of green work engagement. For this purpose, the estimation of the data collected from 368 respondents serving the chartered university (public and private) in Pakistan was executed using SPSS and Smart PLS. The demographic summery was reported with the help of SPSS analysis while the remaining estimations like convergent reliability & validity, discriminant reliability and validity, measurement model, structural model and structural model estimations for hypothesis testing was executed with the help of Smart PLS. The detail of each one stated above were described in their separate heads as follows.



### Demographics Aspects

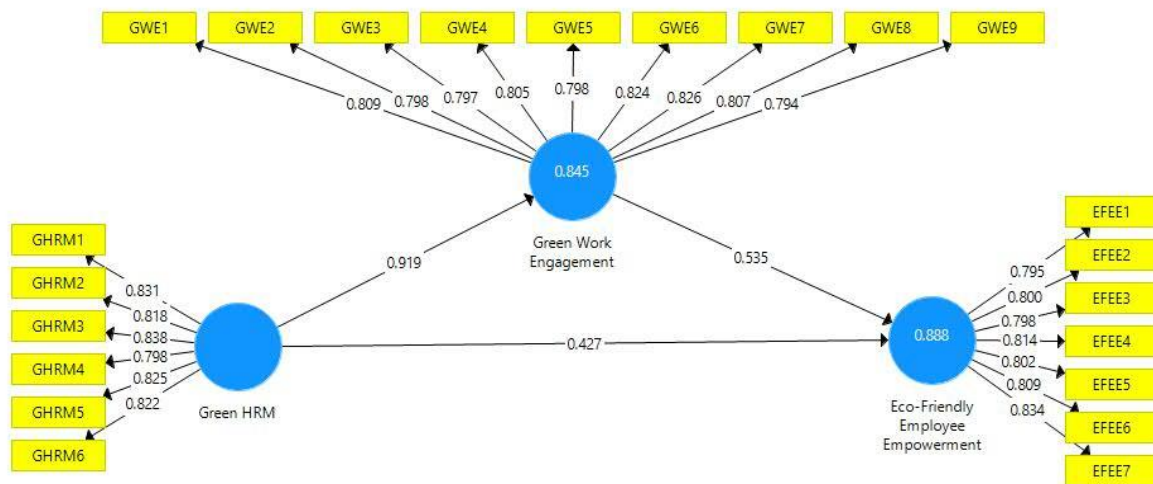
The demographic summery was reported in table 1 for the characteristics like gender, age, marital status, qualification, and job-experience in the form of mean, standard deviation, frequency (N) and percentage of response rate.

**Table 1: Summery of Demographic Features**

Demographic features	Mean	Std	N	%
<b>Gender</b>	0.71	0.46		
• Female			108	29.3
• Male			260	70.7
<b>Age</b>	2.85	1.16		
• 20-29 Years			38	10.3
• 30-39 Years			127	34.5
• 40-49 years			93	25.3
• 50-54 years			73	19.8
• 55 or greater			37	10.1
<b>Marital Status</b>	2.01	0.45		
• Single			36	9.8
• Married			294	79.9
• Divorced			38	10.3
<b>Qualification</b>	2.60	1.12		
• Undergraduate			94	25.5
• Graduate			54	14.7
• M.Phil./MS			127	34.5
• PhD			93	25.3
<b>Job Experience</b>	2.45	0.67		
• Less than 5 years			38	10.3
• 5-10 years			127	34.5
• Greater than 10 years			203	55.2

The table 1 above indicated that there were 260 males and 108 females responded to the questionnaire of the study. The response rate for male was 71% approximately and for female was 29% approximately. The characteristic of age indicated that majority of the respondents were from the age group of 30-39 years which accounts for 34.5% approximately. Similarly, the majority of the respondents were married which accounts for 80% approximately in the study. Similar, most of respondents were M.Phil./MS qualified with an experience greater than 10 years.

The measurement model of the study is indicated in figure 2 below with the indication of path coefficients and r-squares along-with the factor loading values for each factor contributing in the measurement of its construct.



**Figure 2: Measurement Model**

Figure 2 indicates that green practices of HRM (GHRM) is strongly determined by six-factors as per the study of (Hameed et al., 2020). Similarly, green work engagement (GWE) is strongly determined by nine-factors and is consistent with the study of (Singh et al., 2020). Additionally, the eco-friendly employee empowerment (EFEE) is strongly determined by seven factors and is consistent with the study of (Hameed et al., 2020; Singh et al., 2020).

The figure further shows that an optimistic link is established between Green HRM and Eco-friendly employee empowerment with a coefficient value of 0.427. Similarly, a positive link between Green HRM and Green work engagement was also observed with the coefficient value of path as 0.919. Additionally, another positive link was observed between green work engagement and eco-friendly employee empowerment with the path coefficient value of 0.535. The R-square value of endogenous variable indicates that 89% variation approximately in the eco-friendly employee empowerment is explained by Green HRM practices as well as Green work engagement in the higher education sector of Pakistan. The remaining 11% variation in the eco-friendly employee empowerment is due to the un-observed factors.

Table 2 indicates the model fit indices as computed by Smart PLS while the estimation of measurement model. For a model to be statistically fit, the SRMR value should be less than 0.08 and the NFI value should be greater than 0.90 (Hair, Anderson, Babin, & Black, 2010).

**Table 2: Model Fit Indices**

	Saturated Model	Estimated Model	Threshold
SRMR	0.036	0.036	<0.08
d_ ULS	0.332	0.332	N/A
d_ G	0.255	0.255	N/A
Chi-Square	490.594	490.594	N/A
NFI	0.925	0.925	>0.90

Table 2 indicated that the measurement model is statistically fit as it is meeting the requirements and threshold level of SRMR and NFI level.

**Convergent validity and Reliability**

The reliability and validity of constructs and their relevant factors is confirmed by way of factor loadings, Cronbach alpha, rho, composite reliability, and average variance extracted. According to factor loading criteria, the loading value should be at least 0.70 for a factor to be reliable and valid for a construct measurement (Hair et al., 2010). Similarly, for a construct to be reliable and valid using the criteria of Cronbach alpha, rho, and composite reliability, the threshold level is equal to or greater than 0.70 (Hair et al., 2010; John & Benet-Martínez, 2014). However, for AVE, the criteria is at least a value of 0.50 or greater (Fornell & Larcker, 1981; John & Benet-Martínez, 2014).

**Table 3: Convergent Validity and Reliability**

<b>Factors and Constructs</b>	<b>Loadings</b>	<b>CA</b>	<b>Rho</b>	<b>CR</b>	<b>AVE</b>
<b>Eco-Friendly Employee Empowerment</b>		<b>0.911</b>	<b>0.911</b>	<b>0.929</b>	<b>0.652</b>
• EFEE1	0.795				
• EFEE2	0.800				
• EFEE3	0.798				
• EFEE4	0.814				
• EFEE5	0.802				
• EFEE6	0.809				
• EFEE7	0.834				
<b>Green HRM Practices</b>		<b>0.904</b>	<b>0.904</b>	<b>0.926</b>	<b>0.676</b>
• GHRM1	0.831				
• GHRM2	0.818				
• GHRM3	0.838				
• GHRM4	0.798				
• GHRM5	0.825				
• GHRM6	0.822				
<b>Green Work Engagement</b>		<b>0.933</b>	<b>0.933</b>	<b>0.944</b>	<b>0.650</b>
• GWE1	0.809				
• GWE2	0.798				
• GWE3	0.797				
• GWE4	0.805				
• GWE5	0.798				
• GWE6	0.824				
• GWE7	0.826				
• GWE8	0.807				
• GWE9	0.794				

Table 3 indicated that all the factors, and their relevant constructs are internally and externally valid and reliable by meeting the criteria set by factor loading, Cronbach alpha, rho, composite reliability, and average variance extracted. Hence, it is confirmed that Green HRM practices, Green work engagement, and eco-friendly employee empowerment are valid and reliable constructs in the higher education sector of Pakistan.

#### **Discriminant validity and Reliability**

Discriminant validity and reliability indicates the external reliability and validity of the construct using the criterion of Fornell and Larcker (1981). According to this criteria, the

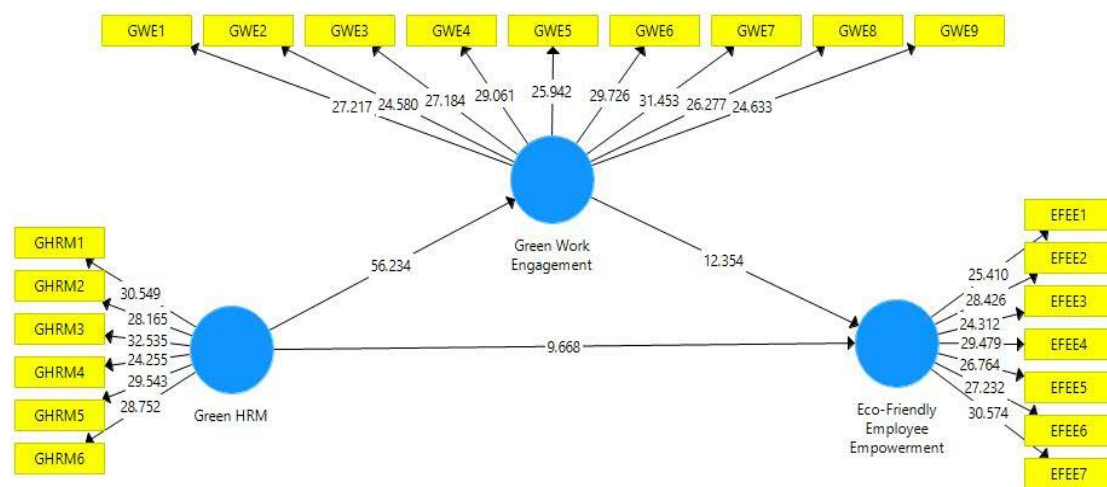
composite coefficient values of each construct should be lower than the square root of AVE for each construct.

**Table 4: Discriminant Validity and Reliability**

Constructs	EFEE	GHRM	GWE
<b>Eco-Friendly employee empowerment (EFEE)</b>	0.808		
<b>Green HRM (GHRM)</b>	0.719	0.822	
<b>Green work engagement (GWE)</b>	0.727	0.716	0.806

Table 4 above confirmed that all the constructs are discriminately valid and reliable by meeting the criteria set by Fornell and Larcker (1981) for external reliability and validity of the constructs.

Figure 3 below indicates the structure model of the study. It indicates the t-values for estimating the significance of path link between the construct. For a path link to be significant between two construct, the t-value should be greater than 1.96 (Hair et al., 2010).



**Figure 3: Structural Model**

Figure 3 above indicates the significance of structural path between two constructs. It indicates that there is a significant link/structure between Green practices of HRM and eco-friendly employee empowerment with the t-value of 9.668. Similarly, another highly significant link was observed between Green practices of HRM and green work engagement with the t-value of 56.234. Finally, another strong structure was confirmed between green work engagement and eco-friendly employee empowerment in the

higher education sector of Pakistan. The significant relationship confirmed the acceptance of all the hypothesis of the study.

### Structural Equation Modeling and estimations

The structural equation modeling as executed with the help of smart PLS is reported in table 5. It indicated 3 direct structures between Green HRM and eco-friendly employee empowerment, green HRM and green work engagement, green work engagement and eco-friendly employee empowerment in the higher education sector of Pakistan. Additionally, a mediating relationship is also reported table 5 by using green work engagement as the mediator between the relationship green HRM and eco-friendly employee empowerment.

**Table 5: SEM Model Estimations**

Direct Effects	Sample Mean (M)	S.D	T	P	Hypothesis
<i>GHRM -&gt; EFEE</i>	0.916	0.017	54.06	<b>0.000</b>	<b>Accepted</b>
<i>GHRM -&gt; GWE</i>	0.917	0.016	56.23	<b>0.000</b>	<b>Accepted</b>
<i>GWE -&gt; EFEE</i>	0.536	0.043	12.35	<b>0.000</b>	<b>Accepted</b>
<b>Specific Indirect Effect</b>					
<i>GHRM -&gt; GWE -&gt; EFEE</i>	0.492	0.041	11.871	<b>0.000</b>	<b>Accepted</b>

The table 5 above indicated that there is a highly significant relationship between Green HRM practices and eco-friendly employee empowerment in the higher education sector of Pakistan with the coefficient value of 0.916. It accepted the first hypothesis and the finding is consistent with the similar significant findings of (Alzgool, 2019; Hameed et al., 2020; Hosain & Rahman, 2016; Jyoti, 2019; Kim et al., 2019; Mishra, 2017; Ojo & Raman, 2019; D. W. S. Renwick et al., 2016; Sharma & Gupta, 2015; Tariq et al., 2016; Zhang et al., 2019).

Similarly, there was a highly significant and positive link between green HRM and green work engagement in the higher education sector of Pakistan with the coefficient value of 0.917. It accepted the 2<sup>nd</sup> hypothesis and is consistent with the similar findings of the study of (Karadas, 2016; Kimberley & Bakker, 2015; Lee & Chihyung., 2015; Saeed et al., 2019; Tariq et al., 2016; Zaki & Norazman, 2019).

Additionally, a positive and highly significant link was estimated between green work engagement and eco-friendly employee empowerment in the higher education sector of Pakistan with the coefficient of 0.536. It accepted the third hypothesis and is consistent with the similar positive and significant estimations of (Dumont et al., 2017; Lee & Chihyung., 2015; Mandip, 2012; D. W. S. Renwick et al., 2016; Ugwu et al., 2014).

Finally, a strongly positive mediation effect was confirmed by green work engagement in relation to green HRM and eco-friendly employee empowerment with the coefficient value of 0.492. It accepted the 4<sup>th</sup> hypothesis and is also consistent with the similar findings of (Hameed et al., 2020).

### Conclusions and Recommendations

The present study was meant to explore the mediation impact of green work engagement in the relationship of green HRM practices and eco-friendly employee empowerment in the higher education sector of Pakistan. For achieving these objective, the data was collected using convenience sampling approach through online means from the employees serving in the chartered universities in the major cities of Pakistan. A self-administrative survey questionnaire was used for this purpose, a received response from 368 participants. The exogenous variable was green HRM practices, while the endogenous variable was eco-friendly employee empowerment and the mediating variable was green work engagement. The data was estimated using SPSS and Smart PLS. The method of estimation includes demographic summery, measurement model, convergent validity and reliability, discriminant validity, structural model and SEM estimations. The initial analysis of the data revealed that all the factors along-with their constructs were internally and externally reliable and valid. The structural equation modelling revealed that all the hypothesis was accepted and the SEM estimation concluded that there is a strong mediating effect of green work engagement in the relationship of green HRM and eco-friendly employee empowerment. The managerial implications of the study are that the policymakers and management of higher education sector of Pakistan can boost the eco-friendly empowerment of their employees by carefully considering the green practices of HRM and green work engagement of their employees. The findings of the study are applicable to the education/higher education sector of other regions but no other sector due to the distinct nature of targeted population. The future research may include the other factors of green management like csr or cg for examining their impact in the eco-friendly employee empowerment for the higher education sector of Pakistan.

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