

Effect Green Human Resource Management on Green Innovation through Green Human Capital

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Abstract

The current literature in the environmental management domain suggests that employee behavior is critical to improving environmental outcomes. Still, few studies have examined how human resource management (HRM) is linked to organisational green innovation. The study aims to investigate the relationship between green human resource management and green innovation in the manufacturing industry through the lens of green human capital. The study included 240 participants from various occupational levels, including frontline workers, entry-level management, middle management, and top management employees at various manufacturers in Semarang, Central Java, Indonesia. Data were gathered using stratified random sampling and analyzed using the partial least structural equation modeling (PLS-SEM) technique. As a result, GHRM made a positive contribution to organizational green innovation. The mediating effects of green human capital were also statistically significant. The study adds to the body of knowledge by investigating environmental protection using the human capital theory and providing empirical evidence on hypothesized relationships. Furthermore, the study broadens the GHRM scope by including predictors such as green human capital for improved manufacturing industry performance.

Keywords: *Green Human Resource Management, Green Innovation, Green Human Capital*

Introduction

Because of the quick rise and development of the economy, a great deal of environmental problems have been brought to light (Y. J. Kim, Kim, Choi, & Phetvaroon, 2019; Munawar, Yousaf, Ahmed, & Rehman, 2022; Watson & Tidd, 2018). The actions of the manufacturing industry may result in environmental restrictions such as the depletion of natural resources, climate change, and the release of various environmental pollutants that contribute to the pollution of water, air, light, and sound, as well as the extinction of species. These environmental constraints may also lead to the extinction of individual species. Many businesses and governments have acknowledged the relevance of environmental sustainability for developing both the economy and society. Considering the topic matter, it is necessary for the general public to be aware of and concerned about issues about the environment or sustainability, such as recycling, conversion, and renewable energy sources (Ecer, Pamucar, Mardani, & Alrasheedi, 2021). GHRM is a method that aims to achieve environmental objectives while simultaneously boosting its popularity (Guerci, Longoni, & Luzzini, 2016; Tang, Chen, Jiang, Paille, & Jia, 2018). Innovation, which affects customer satisfaction, trust, credibility, and preference in the manufacturing business, has become necessary for GHRM practices, which have become essential for innovation to obtain a competitive edge and provide the greatest environmental performance (Hollebeek & Rather, 2019; E. Kim, Tang, & Bosselman, 2019; Yen, Teng, & Tzeng, 2020).

There have been considerable green initiatives undertaken by several companies, notably the industrial sector. These initiatives include the conversion of water and energy, the reduction of waste,

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the elimination of food waste, and the education of both workers and customers of the concerns (Darvishmotevali & Altinay, 2022; Pham, Hoang, & Phan, 2020). Furthermore (Yong, Yuzliza, Ramayah, & Fawehinmi, 2019). In 2007, academics started putting more emphasis on environmentally responsible working practices. Earlier research has shown that big production chains successfully cut their water and energy use between the years 2009 and 2014 by introducing operational objectives, norms, and environmentally friendly initiatives. As a consequence of this, the efforts urge companies operating in various industries to foster a culture that prioritizes the preservation of the environment (Munawar et al., 2022).

A number of scholars brought attention to the subject by elaborating on the influence that green human resource management strategies (green engagement and training, green performance, green hiring, and green remuneration) have on the outcomes concerned with the environment (Yong et al., 2019; Y. Zhang, Luo, Zhang, & Zhao, 2019). It is possible that the procedures will enhance the industry's long-term reputation as well as its environmental performance. These practices reflect the industry's dedication to environmental protection (Tang et al., 2018). According to (Yang, Wang, Huang, & Chen, 2022), in organizations that are looking to gain a competitive edge, the most significant variables are the intellect, skills, and talents of these individuals. According to (Ahmad, Salamuddin, & Surat, 2022), it is possible for individuals to be born with innate capabilities or acquire them via the process of learning, which may ultimately turn them into human capital if they are given further attention.

Incentives, human resource management, and training and development are all many strategies to acquire or attain green HRM. Employees can have a more constructive engagement with environmental challenges. According to the findings of recent research, GHRM has the ability to improve the abilities of an industry's human capital and MEC, which eventually has an effect on the performance of the business (Fawehinmi, Yuzliza, Mohamad, Noor Faezah, & Muhammad, 2020) and sustainable innovation progress (Roscoe, Subramanian, Jabbour, & Chong, 2019). Consequently, research needs to investigate the ways in which green human capital promotes green innovation in corporations. In spite of the fact that it is one of the most significant variables (Brookes & Altinay, 2017). The inability of employees to establish attitudes and actions that are acceptable for dealing with environmental problems is a consequence of their lack of awareness of environmental concerns. To be more specific, the purpose of the research is to demonstrate how GHRM has an effect on green innovation inside corporations by converting people into green human capital. The following are the causes that led to the development of the research model: From the perspective of GHRM, human resource management apps have the potential to assist in the creation of environmentally friendly products or industrial strategies. Second, according to the human capital theory, GHRM is a supplement to human capital, which results in an increase in environmentally conscious innovation within the sector. Third, managing human resources in sectors confronted with environmental difficulties has a considerable influence on the consequences of management environmental exercises that ultimately result in green innovation.

Literature Review

Green Human Resource Management and Green Human Capital

According to the notion of human capital, human capital is comprised of the characteristics of workers, which include capabilities, wisdom, knowledge, commitments, skills, attitudes, experiences, and creativity. These characteristics are able to be accessed in order to increase values, which ultimately allows for the acquisition of a competitive advantage (Sun, Li, & Ghosal, 2020). When it comes to competitiveness in the manufacturing business, human capital is something that is unique to each company. It offers key resources and competencies that are necessary for competition, which makes it tough for other industries to reproduce (Zahra, Neubaum, & Hayton, 2020). It is possible for companies to uncover chances to profit from a better environment by applying proactive measures and responses to environmental difficulties when they are confronted with environmental constraints (Chen & Chang, 2013; López et al., 2025; Lutfi, 2025). It is as a consequence of this that a number of studies have explored the aspects that impact green human capital, such as the opinions of corporations about the environment and their worries for society (Chen & Chang, 2013; Munawar et al., 2022). In spite of this, there has been no investigation into the connection between green human capital and GHRM from any study. On the basis of this, the following theory is put forward:

H1: Green human resource management has a positive effect on green human capital

Green Human Capital and Green Innovation

Green human capital, which includes environmental knowledge, attitude, creativity, experience, ability, capacity, innovation, and dedication, was introduced as a means of applying the notion to the conservation of the environment. It has been suggested by a few scholars that human capital may not have any impact on the growth of the economy and the environment (Yusoff, Omar, Zaman, & Samad, 2019). Moreover (Yusliza et al., 2019), research shows that green human capital improves manufacturing's social, financial, and ecological outcomes. Similarly Mansoor, Jahan, & Riaz (2021) revealed that the social, economic, and environmental results of manufacturing may be enhanced with green human capital, according to research (Munawar et al., 2022; Rezaei et al., 2025; Shamsuddin & Raza, 2025).

Through the use of knowledge and technology in manufacturing, green innovation has the potential to decrease pollution levels while simultaneously generating economic advantages (Aldieri, Kotsemir, & Vinci, 2020; Fan, Lian, Liu, & Wang, 2021; J. Zhang et al., 2020). The industrial sector may play a significant role in lowering greenhouse gas emissions via green product development and process innovation (Awan, Arnold, & Gölgeci, 2021). At the same time, new goods and services are examples of innovation as they are the results of inventive activity inside an industry (H. Kim, Im, & Qu, 2018). Additionally, innovation is a significant approach for addressing the worries that the manufacturing sector has about poor efficiency and excessive pollution production (Munawar et al., 2022). In light of this, one of the most important aspects is to encourage high-quality development in the manufacturing sector in Semarang, Central Java, Indonesia, via the implementation of environmentally friendly innovations. On the basis of this, the following theory is put forward:

H2: Green human capital has a positive effect on green innovation

Green Human Resource Management and Green Innovation

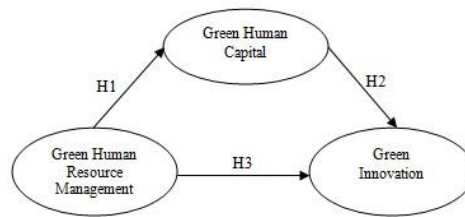
Under the strain of environmental rules and legislation, the manufacturing sector has to demonstrate a proactive commitment to the adoption of technologies that may effectively handle environmental difficulties (Yong et al., 2019). It is becoming more common awareness that the GHRM is an essential technique for putting green practices into action, which in turn improves environmental performance and encourages long-term growth (Dragomir, 2020; Ren, Tang, & Jackson, 2018). Numerous research have been conducted to study the manner in which and the timing of GHRM's impact on environmental performance, which may lead to competitive benefits for organizations (Ali, Wang, Jiang, & Ali, 2019). For instance (Guerci et al., 2016). Few studies have looked at how green innovation and GHRM relate to one another. However, GHRM does impact the connection between stakeholder demands and environmental performance. Recently, Harb & Ahmed (2019), O'Donohue & Torugsa (2016) investigated the effect of GHRM on perceived financial sustainability in the hospitality industry. On the basis of this, the following theory is put forward:

H3: Green human resource management has a positive effect on green innovation

Green Human Resource Management, Green Human Capital, and Green Innovation

However, the link between GHRM and green human capital has not been investigated. Recent research has shown that green human capital may benefit from GHRM. Industries rely on human resource strategies to cultivate human capital in order to handle environmental problems when faced with external environmental challenges (Yong et al., 2019). Moreover (Yusliza et al., 2019), It has been discovered that green human capital has a beneficial effect on the social, economic, and environmental performance of the manufacturing sector. Similarly (Mansoor et al., 2021), Human capital that is environmentally conscious has a substantial influence on the environmental performance of the industry. Nevertheless, there has been no research conducted on the connection between green human capital and the environment. By using knowledge and technology in the industrial sector, green innovation has the potential to lessen the amount of pollution that is produced and to bring about economic advantages (Aldieri et al., 2020; Fan et al., 2021; J. Zhang et al., 2020). Two essential elements that allow the manufacturing sector to mitigate global warming are the creation of environmentally friendly products and the introduction of innovative processes. (Awan et al., 2021). On the basis of this, the following theory is put forward:

H4: Knowledge creation mediates effect of network capability and MSMEs performance

**Figure 1: Empirical Model**

Source: Authors.

Methodology

Research Approach

Descriptive research methods, which formed the backbone of the study, are predicated on the idea that the fundamental goal of any inquiry is to record details on a particular event, often at a discrete moment in time (as in a cross-sectional survey) (Esitti & Kasap, 2019). Since the most fundamental kind of inquiry primarily aims to observe (get data about) certain occurrences, descriptive research methods may operate on this premise. In order to test the hypotheses, this study uses a descriptive research technique and survey measures to gather information on manufacturing enterprises. Because of this, the study can answer the research questions. Conducting a literature study to find relevant subjects is the first stage in this method. After looking over what has already been done in the field, an investigation framework is established. After that, the survey was utilized in conjunction with structural equation modelling to create and validate the SEM.

Questionnaires Item

Table 1: Questionnaires Item

No	Variables	Indicators
1	Green Human Resource Management (GHRM)	1. Environmental commitment can attract more employees in my organization (reward and compensation) 2. Employee involvement in environmental issues is valued within an organization. 3. Environmental training for employees can improve performance. 4. Offer non-monetary incentives and variable compensation for environmental performance (Guerce et al., 2016; Munawar et al., 2022)
2	Green Human Capital (GHC)	1. Company managers provide full support to employees in achieving environmental protection goals. 2. The company's employees excel in environmental protection compared to major competitors. 3. The company has a higher level of cooperation in environmental protection than its main competitors. 4. The company outperforms its competitors in terms of employee contributions to environmental protection. (Chang, 2016; Munawar et al., 2022)
3	Green Innovation (GI)	1. The company minimizes the number of materials used in product development and design. 2. The company considers the ease of recycling, reuse, and decomposition when developing or designing products. 3. The company's manufacturing process minimizes hazardous emissions and waste.

		4. The company's manufacturing process uses fewer raw materials. (Chang, 2011; Munawar et al., 2022)
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Source: Literature Reviews.

Sample

The sample included 240 participants from various manufacturing businesses in Semarang City. Respondents in this study run a manufacturing business in Semarang City, Central Java, Indonesia. We selected respondents from the manufacturing industry based on their occupational levels, which included frontline workers, entry-level management, middle management, and top management employees from various manufacturers in Semarang, Central Java, Indonesia. The data collection period ran from January to August 2024. It was determined that a total of one thousand questionnaires were issued. On the other hand, for the subsequent analysis, only replies from respondents showed that they had utilized at least one variation of the form and had completed the questionnaire items. Twenty-four questionnaires that were considered to be legitimate were handed in. For both the creation of the questionnaire and the collection of the data, the researcher used Google Forms. The information obtained from Google Forms was saved in Google Drive. With the circumstances of the research, it was not feasible to conduct face-to-face interaction; thus, the data collection was carried out via Google Forms. As a result of the fact that each questionnaire and invitation to take part in the survey was sent out without any identifying information, the identity of the respondents was kept confidential.

Measures

Cross-sectional data is used to verify the theoretical model that has been provided. For the purpose of gathering the data, approaches that were based on a survey of the target population were used. An evaluation of the indicators was carried out using a Likert scale with five points for each category. Five anchors are on the scale, with one signifying strongly disagreeing and five representing strongly agreeing. The scale ranges from one to five. For the purpose of this investigation, a Likert scale with five points was used since it is less time-consuming and enables respondents to maintain a neutral stance by selecting the "neither agree nor disagree" option. In addition, a Likert scale with five points was used in this research since other studies have proved the advantages of using this methodology (Chatterjee, Chaudhuri, González, Kumar, & Singh, 2022; Dubey et al., 2019; Gupta, Justy, Kamboj, Kumar, & Kristoffersen, 2021).

Data Analysis

In a recent study, the Smart PLS program was applied for the purpose of doing data analysis utilizing PLS-SEM (Ringle, Wende, & Becker, 2015). As a result of its technologically sophisticated estimates and widespread usage in the GHRM field (Rasoolimanesh, Ali, & Jaafar, 2018). Furthermore, the research made an effort to forecast and characterize the constructs; hence, PLS is a more suitable method for analysis, as demonstrated by J. F. Hair, Howard, & Nitzl (2020). The PLS-SEM is a useful instrument for using the structural model in order to describe and evaluate structures. In addition, the versatile instrument is used in the process of model formation when different hypotheses are being investigated. It is also possible to utilize the tool to achieve particular findings after resolving concerns about the sample size and the normalcy of the data. According to the recommendations made in the PLS-SEM literature, the research examined the findings using a method that consisted of two steps (Siyal, Donghong, Umrani, Siyal, & Bhand, 2019). The first part of the PLS-SEM approach consisted of analyzing the measurement in order to assess inter-item reliability, convergent validity, and internal consistency reliability. The second step consisted of examining the structural model to test the hypotheses (Henseler, Ringle, & Sinkovics, 2009).

Results and Discussion

Table 2 shows the sample's demographics, including employee gender, age, education level, MSME annual income, and tax status. The majority of respondents are 25-34 years old (47.9%), male (62.5%), bachelor (45.8%), permanent (83.3%), and 6-10 years old (33.3%).

Table 2: Sample Characteristics

	Sample Characteristics	N	Percentage
	Age		
1	18-24	30	12.5
2	25-34	115	47.9
3	35-44	60	25.0
4	45-55	35	14.6
5	More than 55	0	0.0
	Gender		
1	Male	150	62.5
2	Female	90	37.5
	Education	240	
1	Senior high school	47	19.6
2	Third diploma	50	20.8
3	Fourth diploma	33	13.8
4	Bachelor	110	45.8
	Nature of Employment		
1	Contractual	40	16.7
2	Permanent	200	83.3
	Length of Work		
1	< 1 years	55	22.9
2	1-5 years	75	31.3
3	6-10 years	80	33.3
4	> 10 years	30	12.5

Source: The Processed Secondary Data (2025)

The Validity Test

Table 3 shows the convergent validity. The reliability and validity of indicators, as well as conceptions, are important factors to consider. The reliability test results, obtained using Cronbach's Alpha, Composite Reliability, and Average Variance Extracted, are shown in Table 3. The test results for dependability are shown in Table 3. The study found that the figures exceeded 0.7, representing the highest levels documented. The data gathered was analyzed using Cronbach's Alpha, and the conclusion drawn is based on the recommendations provided by certain researchers (Bjekić, Strugar Jelača, Berber, & Aleksić, 2021; Taber, 2018). The composite dependence values range over 0.7, which is the highest reported number for composite reliance. Researchers contend that an appropriate criterion for a Critical Composite (CR) is a minimum of 0.7. Based on the data in the table above, researchers can confidently determine that the CR requirement has been satisfied. We may infer that the CR condition has been satisfied based on the evidence. Composite dependability may serve as a substitute for Cronbach's Alpha because of its slightly higher value. However, the disparity between the two is not substantial (Peterson & Kim, 2013).

The average variance obtained (AVE) is tested to determine validity convergence. In Table 3, you can see the AVE numbers. The findings surpass the previously reported greatest levels by a significant margin. If the AVE is less than 0.5, it cannot be deemed adequate (Rouf & Akhtaruddin, 2018). All four aspects of convergent validity have been satisfied since the acceptability criterion has been attained.

The data shown in the Table constitute the foundation for these conclusions. Convergent validity, the heterotrait-monotonic correlation ratio, and discriminant validity hypotheses are the three ways that hypotheses may be tested (Ab Hamid, Sami, & Mohmad Sidek, 2017). Table 4 displays the analysis results demonstrating heterotrait-monotrait comparison (HTMT) discriminant validity.

Table 3: Convergent Validity

Constructs	Items	Loadings	Alpha	CR	AVE
Green Human Resource Management (GHRM)	GHRM 1	0.892	0.920	0.943	0.807
	GHRM 2	0.909			
	GHRM 3	0.912			
	GHRM 4	0.879			
Green Human Capital (GHC)	GHC1	0.912	0.916	0.941	0.799
	GHC2	0.912			
	GHC3	0.864			
	GHC4	0.887			
Green Innovation (GI)	GI1	0.963	0.941	0.958	0.851
	GI2	0.906			
	GI3	0.857			
	GI4	0.960			

Note: CR: Composite Reliability, AVE: Average Variance Extracted

Source: The Processed Secondary Data (2024)

Table 4: Discriminant Validity: Heterotrait-Monotrait (HTMT)

	GHC	GHRM	GI
Green Human Capital			
Green Human Resource Management	0.939		
Green Innovation	0.903	0.926	

Source: The Processed Secondary Data (2025)

All HTMT values greater than 0.9 indicate that the components differ sufficiently, implying that each element represents a distinct set of phenomena (J. Hair, Risher, Sarstedt, & Ringle, 2019). The fact that the numbers are larger than 0.9 suggests this. All of the criteria for HTMT discriminant validity were satisfied, according to the data shown in the table above. After carefully reviewing all of the given facts, this conclusion was made. The significance level of each calculated value exceeds 0.9 (Kock, 2015; Wong, 2013; Iqbal et al., 2021; Hair et al., 2019).

Structural Model

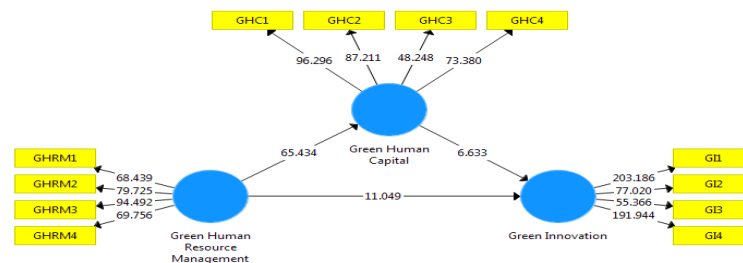
The final step is to investigate the influence of the independent variable GHRM on the dependent variables GHC and GI and GHC's role as a mediator between GHRM and GI. R^2 (R-squared), A statistical measure of the proportion of variance for the dependent variable explained by the independent variables, revealed that "GI" was 35.6 per cent. In comparison, the value of "GHC" was 30.5%, and both values were explained by the model's independent variable "MP". R^2 is a statistical metric representing the proportion of variation in the dependent variable that can be attributed to a specific independent variable. Table 6 provides information about model variables. This table shows the variable means, standard deviations, T-statistics, and p-values.

Table 6: Mean, Standard deviation, T-statistic, and p-value

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	p Values	Results
GHRM -> GHC	0.868	0.869	0.013	65.434	0.000	Accepted
GHC -> GI	0.356	0.354	0.054	6.633	0.000	Accepted
GHRM -> GI	0.558	0.561	0.051	11.049	0.000	Accepted
GHRM -> GHC -> GI	0.309	0.307	0.046	6.744	0.000	Accepted

Source: The Processed Secondary Data (2025)

Based on the information presented in Table 6, the researcher can draw the following conclusions: There is a positive and significant influence between GHRM and GHC ($\beta = 0.868$; $T = 65.434$; $p = 0.000$); there is a positive and significant influence between GHC and GI ($\beta = 0.356$; $T = 6.633$; $p = 0.000$); and there is a positive and significant influence between GHRM and GI ($\beta = 0.558$; $T = 11.049$; $p = 0.000$). It was found that there is a positive mediating effect between GHRM and GI, as an indirect effect of GHRM on GI is significant ($\beta = 0.309$; $T = 6.7444$; $p = 0.000$); Green Human Capital mediates the impact of Green Human Resource Management on Green Innovation. This is because Green HRM significantly directly impacts Green Innovation via Green Human Capital. Figure 2 depicts the graphical correlation between these variables.

**Figure 2: Estimated Path Coefficients**

Source: The Processed Secondary Data (2025)

Discussion

Within the context of the manufacturing sector, this research aims to analyze the interaction between green human resource management and green innovation via the lens of green human capital. Based on the data, it was proved that green human resource management has a positive and substantial influence on green human capital. Previous studies have highlighted that human resource management methods are an effective instrument for expanding and changing the resources of the manufacturing sector into human capital, making it easier for these organizations to accomplish their objectives and missions (**Haldorai, Kim, & Garcia, 2022**). Research that was conducted not too long ago suggested that GHRM may have a good effect on green human capital. Industries employ human resource practices as a vital method for creating human capital to manage environmental issues when they are challenged with environmental challenges that come from the outside (Yong et al., 2019). In addition, participation in organizational activities and training may help increase the available human capital pool. Therefore, to satisfy environmental requirements, companies have the potential to select environmentally conscious individuals. This might affect the workers' capacity to accomplish environmental objectives because of their green consciousness (Li, Naz, Khan, Kusi, & Murad, 2019). In addition, performance assessment and remuneration are essential HR activities that contribute to the

development of human capital within the sector (Amrutha & Geetha, 2020; Arshad, Abid, Contreras, Elahi, & Ahmed, 2022; Jawaad, Amir, Bashir, & Hasan, 2019; Munawar et al., 2022).

The results proved that green human capital influences green innovation. Workers with adequate green human capital can use their strengths and skills for the organisation's growth. In most cases, businesses may choose to employ individuals who have a high level of manufacturing environmental knowledge to put their expertise to use in the field of environmental protection (Gunarathne, Lee, & Kaluarachchilage, 2021). Industries may also choose to invest in their workers' direction and distinctive expertise by providing them with training on various projects. This training may help employees develop abilities that are unique to their company, therefore increasing human capital (Munawar et al., 2022). Additionally, awareness has the potential to enhance the motivation of workers, which in turn assists the manufacturing sector in defining its creative objectives and purpose (Forés & Camisón, 2016).

It was discovered via research conducted in the manufacturing sector that creative practices have a substantial influence on the level of satisfaction, trust, credibility, and preference of customers (Jin, Line, & Merkebu, 2016). Meanwhile (Xie, Zou, & Qi, 2018), the growth of workers' inventive performance was strengthened by the presence of external information resources, which had a beneficial impact. As a consequence of this, top management is obligated to share their expertise with workers. This is a technique that is relatively important and successful when it takes place with employees who can be trusted, as it enables them to recognize and capitalize on chances for innovation effectively (Ojo, Raman, & Vijayakumar, 2020). As a result of having sufficient environmental knowledge, green innovation that is supported inside a sector becomes a distinctive characteristic that creates results that increase environmental performance (Jui-Hsi, Jiun-Kai, Jian-feng, & Ping, 2019). Workers with a solid knowledge of industrial culture are likelier to demonstrate high levels of environmentally conscious innovation in their workplace.

A favorable and considerable effect on green innovation was proven by the results, which showed that green human resource management influences green innovation. The term "green innovation" refers to a sort of invention that lessens the negative effects on the environment while simultaneously achieving the environmental objectives of the business and delivering environmental advantages (Liu, Gao, Ma, & Chen, 2020; Wang, Cui, & Zhao, 2021). The desire and capacity of an industry to accept new ideas, methods, and technology, as well as the ability to produce one-of-a-kind service offerings, are the components that constitute innovativeness (Bibi et al., 2022; Xiong, Khan, Bibi, Hayat, & Jiang, 2023). Previous studies have shown that human resource management (HRM) helps people develop their knowledge, talents, and capacities, encouraging innovation in business processes and products (Seeck & Diehl, 2017). Consequently, the research included three aspects to establish that GHRM has a favorable influence on environmentally conscious innovation. First and foremost, to generate and maintain innovation, the manufacturing sector must provide employment opportunities to those actively involved in environmental activities (Renwick, Redman, & Maguire, 2013). Second, by participating in events and training activities the organisation provides, workers can acquire the knowledge and skills necessary to cultivate their creative and innovative qualities (Singh & El-Kassar, 2019). Third, with green performance management and reimbursement methods, employees' actions may align with the company's environmental objectives (Sepahvand, Nazarpoori, Sepahvand, & Arefnezhad, 2022).

Similarly, green human capital is an intermediary between green innovation and green human resource management. Under the strain of environmental rules and legislation, the manufacturing sector has to demonstrate a proactive commitment to the adoption of technologies that may effectively handle environmental difficulties (Yong et al., 2019). It is becoming more common awareness that the GHRM is an essential technique for putting green practices into action, which in turn improves environmental performance and encourages long-term growth (Dragomir, 2020; Ren et al., 2018). Numerous research has been conducted to study how and the timing of GHRM's impact on environmental performance, which may lead to competitive benefits for organizations (Ali et al., 2019). For instance (Guerce et al., 2016) A few scholars have explored the link between green innovation and green human resource management (GHRM). Still, green human resource management impacts the relationship between environmental performance and stakeholder demands. Recently Harb & Ahmed, (2019), O'Donohue & Torugsa, (2016) investigated the effect of GHRM on perceived financial sustainability in the hospitality industry.

Conclusion

The present research makes a contribution to the existing body of literature on the subject of enhancing environmental performance, particularly when it comes to the manufacturing sector in

Semarang, Central Java, Indonesia. The Green Human Resource Management (GHRM) methodologies were connected to green human capital among industrial workers. To conclude, industrial companies may grow their green human capital by employing conscientious people, giving opportunities for training and development, and preserving green discipline. As a result, green human capital encourages workers to think they can engage in environmentally responsible behaviours since they possess the appropriate skills, abilities, and procedures. Lastly, the circumstance increases environmental consciousness, encouraging innovation to improve environmental performance.

These results contribute to various parts of the literature on human resource management and green innovation for environmental management. To begin, the results of the research indicate that there is a connection between GHRM and green innovation that is founded on the concept of human capital. Consequently, the present research contributes by suggesting that greening human resource management and innovative ways might assist industrial companies in improving their environmental performance. In the second place, the present research contributes to the existing body of literature by investigating the environmental performance of the manufacturing sector, which is confronted with a great deal of difficulty.

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