



GREEN COMPETITIVE ADVANTAGE: THE INFLUENCE OF ENVIRONMENTAL AWARENESS AND HUMAN RESOURCE ON SMES

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Abstract: This study aimed to thoroughly examine the influence of Environmental Awareness and Green Intellectual Capital (GIC), on Green Competitive Advantage, with Green Human Resource Management (GHRM) serving as the mediating or intervening variable. The investigation is particularly important, specifically considering the fact that business actors are currently paying more attention to the adoption and implementation of green business. This adoption is typically in a bid to address the issue of global warming as well as its impact on nature and the increasing consumer decision to make purchases with consideration for environmentally friendly products. In order to achieve the objective, analyzed using Structural Equation Model-Partial Least Square (SEM-PLS). The results showed that Environmental Awareness significantly influenced the increase of knowledge about the green environment, and this, in turn, impacted the management of competent human resource. Furthermore, intellectual capital (IC) was found to have no direct influence on Competitive Advantage of a business, and Green Human Resource Management acted as an effective mediator of the relationship between Environmental Consciousness affects Competitive Advantage.

Keywords: Environmental Consciousness; Green Intellectual Capital; Green Competitive Advantage

Abstrak: Perhatian pelaku usaha sangat tinggi terhadap penerapan green business, sejalan dengan isu pemanasan global yang berdampak pada alam dan semakin meningkatnya keputusan konsumen dalam melakukan pembelian dengan pertimbangan pada produk ramah lingkungan. Analisis data menggunakan Structural Equation Model-PLS. Hasilnya bahwa Kesadaran terhadap Lingkungan sangat mempengaruhi peningkatan pengetahuan tentang Lingkungan hijau, Pengetahuan tentang lingkungan hijau akan mempengaruhi pengelolaan sumber daya manusia yang memiliki pengetahuan lingkungan hijau, dan tidak memberikan pengaruh langsung terhadap Keunggulan bersaing suatu usaha, Namun Pengelolaan Sumber daya Manusia yang memiliki wawasan lingkungan hijau mampu menjadi variable perantara yang memperkuat Kesadaran lingkungan hijau mempengaruhi keunggulan bersaing.

Kata Kunci: Kesadaran Lingkungan; Modal Intelektual Ramah Lingkungan; Keunggulan Kompetitif Ramah Lingkungan

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Introduction

Within the current business landscape, the majority of consumers (approximately 81%) have been observed to prefer companies that actively contribute to improving environmental conditions, as evidenced by the reports of Nielsen. This elucidation is further supported by the results from another previous study, which showed how consumer awareness about environmental responsibility among millennials (85%), Gen Z (80%), and more than 73% of consumers facilitated the expression of willingness to adopt more environmentally friendly products, with approximately 41% of the study participants having specifically signified preference for natural and organic products.¹ In the era of globalization, which typically comprises rapid technological advances, growing customer needs, and global economic turmoil, companies are actively developing novel solutions to survive in the highly competitive market. To achieve and maintain a competitive edge, businesses must effectively capitalize on respective resources and develop relevant competencies. This is particularly important because the knowledge level of any business constitutes the basis on which the business will identify and adopt advantageous novel opportunities as well as develop key competencies. A specific intangible asset based on knowledge is generally referred to as Intellectual Capital (IC). This asset has been reported across various studies to be the principal source of Competitive Advantage in the knowledge economy. However, novel crises and the current evolving economic and political structures are largely necessitating enterprises to review respective strategies in order to ensure lasting Competitive Advantage. Based on the explanation, growth in Environmental Awareness and special emphasis on sustainable management can be seen to invariably points toward the conclusion that investment in Green Intellectual Capital (GIC) may prove an effective strategy for gaining a competitive edge.²

Various natural disasters have occurred over the years, and this has made business actors aware of the importance of maintaining environmental sustainability. On the basis of this awareness, the term environmentally friendly studies has been developed for various disciplines such as green economy, green culture, green government, eco-city, green product, green design, etc. According to a prior exploration, global public awareness of environmental sustainability has also triggered the adoption of a green lifestyle, and current consumer demands have shifted towards the consumption and utilization of environmentally friendly products, which if responded to positively presents a great opportunity.³

To meet this demand, businesses must possess both tangible and intangible assets as capital. Accordingly, Small and Medium Enterprises (SMEs), as an economic sector that plays an important role in economic growth, must possess sufficient knowledge about current trends to reach potential consumers. For instance, in the current era where global

¹ Ni Kadek Mita Ayu Wandari And Gede Sri Darma, "Pengelolaan Karakter Green Behavior Pada Generasi Milenial Dalam Meningkatkan Minat Penggunaan Green Product," *Jurnal Akuntansi Dan Manajemen* 17, no. 02 (2020): 48.

² Edyta Bombiak, "Effect Of Green Intellectual Capital Practices On The Competitive Advantage Of Companies: Evidence From Polish Companies," *Sustainability* 15, no. 5 (2023): 4050.

³ Mila Badriyah, *Manajemen Sumber Daya Manusia*, (Bandung: Pustaka Setia, 2015).

warming is perceived as a threat, SMEs must possess Green Intellectual Capital, which is simply intellectual capital with a basis on relevant environmental knowledge. As stated in a previous study, Green Intellectual Capital is an intangible asset typically owned by businesses. It comprises knowledge, wisdom, experience, and innovation in the area of environmental protection. The asset also consists of different aspects such as Green Human Capital, Green Structural Capital (GSC), and Green Relational Capital.⁴

In order to effectively grow Green Intellectual Capital in a business, stakeholders within the venture must possess environmental consciousness.⁵ Increasing and availing sufficient Green Intellectual Capital in businesses is important, specifically considering the fact that the asset facilitates proper Green Human Resource Management (GHRM) and has also been proven to increase competitiveness and excellence in SMEs.⁶ Currently, the majority of SMEs have not included environmentally friendly criteria as an important and integral part of respective business activities, due to the lack of knowledge about caring for the environment, the absence of financing allocated towards the maintenance of environmental health, and the low level of consumer awareness to use environmentally friendly products. In this context, limitations such as lack of information, limited knowledge, lack of willingness to share, and limited awareness are inhibiting factors in the low category, while limited public funding is an inhibiting factor in the high category for the majority of ecopreneurs. However, the reasons such as realizing green values, filling certain gaps in the market, making a living, being accountable to self, and passion are high triggering factors for ecopreneurs.⁷ Based on this elucidation, this current study was conducted with the aim of examining the influence of environmental consciousness and Green Intellectual Capital on Competitive Advantage across SMEs, with Green Human Resource Management serving as an intervening variable. Generally, SMEs are targeted to serve as mediums for increasing awareness of environmental sustainability because most economic actors in Indonesia are from SMEs sector.⁸

The existence of environmental damage greatly disrupts ecological balance and this invariably has an impact on daily human lives. Typically, the ability of nature to carry out production activities will decrease and human needs increase in line with population growth if ecological imbalance occurs. Considering this issue, public awareness of environmental problems becomes very important, but based on observation, the awareness level of Indonesians about protecting nature is still very low. Saving the environment from

⁴ Yu-Shan Chen, "The Positive Effect of Green Intellectual Capital on Competitive Advantages of Firms," *Journal of Business Ethics* 77, no. 3 (2008): 271.

⁵ Ching-Hsun Chang And Yu-Shan Chen, "The Determinants Of Green Intellectual Capital," *Management Decision* 50, no. 1 (2012): 74.

⁶ Qurota A'yuni And Muafi Muafi, "Pengaruh Green Intellectual Capital Terhadap Keunggulan Kompetitif Dengan Pemediasi Green Human Resource Management," *JBTI : Jurnal Bisnis Teori Dan Implementasi* 11, no. 2 (2020).

⁷ Yulianti, "Influence Of Fraud Pentagon Toward Fraudulent Financial Reporting In Indonesia An Empirical Study On Financial Sector Listed In Indonesian Stock Exchange.," *International Journal Of Scientific & Technology Research* 8, no. 8 (2019).

⁸ Alifira Nabila Zalfa And Nova Novita, "Green Intellectual Capital Dan Sustainable Performance," *InFestasi* 17, no. 2 (2021).

damage is closely related to improving morals and making people aware of the importance of protecting nature in order to reduce the ecological crisis in the country.⁹

In Jambi City, various SMEs have been observed to still be in the business of Jambi Batik production. These SMEs often produce harmful wastes, which are disbursed in the river because most of Jambi Batik production locations are along Batanghari River.¹⁰ This shows that the understanding of SMEs stakeholders about the theory of Environmental Awareness is still limited, even for the younger generation.¹¹ The condition of Batanghari River has also decreased in quality and is included in the moderately polluted category.¹²

Based on the observed limitation, it is necessary to carry out comprehensive studies related to the preservation of environmental health among SMEs in order to equip the ventures and associated stakeholders with sufficient competence that will facilitate competitiveness in the current business landscape. This form of competitiveness can be achieved through the possession of well managed human resource that is well managed using environmentally sound management approaches and provided with sufficient information capable of fostering Green Environmental Awareness, and instill relevant knowledge about the environment.

Methods

This study examines the influence of Environmental Consciousness and Green Intellectual Capital, on Green Competitive Advantage with Green Human Resource Management serving as a mediating or intervening variable. An intervening variable is one that in theory can indirectly influence (mediate) the relationship between the independent and dependent variable. Accordingly, primary data was obtained directly from SEMs owners located in Jambi City and East Tanjung Jabung through the administration of questionnaires as the study instrument. The instrument incorporated a 5 Likert scale measurement namely Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and Strongly Agree = 5.

SMEs included in this study were determined using the purposive sampling approach based on certain considerations, namely Muslim, located in Jambi City and East Tanjung Jabung, and Small Business Category has a minimum of 3 employees. Determination of sample size was carried out using the Slovin formula as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Description:

n = Sample size/number of participants

⁹ Nurul Qur'ani Islamiyah, "Tingkat Kesadaran Masyarakat Dalam Menjaga Lingkungan Di Era Pandemi Covid-19 Di Kelurahan Warugunung, Kota Surabaya," *SOCLA: Jurnal Ilmu-Ilmu Sosial* 19, no. 1 (2022): 1.

¹⁰ Mhd Ansori And Nuraini Nuraini, "Pengawasan Pemerintah Daerah Terhadap Limbah Usaha Batik Di Kota Jambi," *Wajah Hukum* 4, no. 1 (2020): 73.

¹¹ Agus Sugiarto And Diana Gabriella, "Kesadaran Dan Perilaku Ramah Lingkungan Mahasiswa Di Kampus," *Jurnal Ilmu Sosial Dan Humaniora* 9, no. 2 (2020): 260.

¹² Erna Rahayu Eko Wiriani, "Analisis Kualitas Air Sungai Batanghari Berkelanjutan Di Kota Jambi," *Jurnal Khazanah Intelektual* 2, no. 2 (2020): 219.

N = Population size

e = Percentage of tolerance for sampling error accuracy; $e = 0.1$.

The study population comprised 3,506 SMEs in Jambi City and 1,135 businesses in East Tanjab. These areas are the top 2 with the most small businesses in Jambi Province. Using the Slovin formula above, the sample for Jambi City area amounted to 75 businesses, and for East Tanjab, 25 businesses. Subsequently, the questionnaire was distributed to the two areas and 100 feedbacks were selected and used as primary data in this study. The study indicators are presented in Table 1:

Table 1: Operational Definition of Study Variables

Definisi	Indikator
Environmental Consciousness (X1) is a behavior that is aware of the environment in an organization in producing a product that has benefits but also reduces the emergence of negative impacts on the natural environment.	<ul style="list-style-type: none"> a. Ethically and socially responsible b. Ethics and social responsibility are essential for profitability c. Ethics and social responsibility are essential for business sustainability d. Businesses must be socially responsible to generate profits e. Must have a clear environmental policy f. Management must be responsible for the environment g. Employees must understand environmental policies h. Conduct environmental monitoring and assessment
Green Intellectual Capital (X2) is the totality of knowledge, information, technology, intellectual property rights, experience, organizational learning and competencies, team communication systems, customer relationships, and brands that create value for the company.	<ul style="list-style-type: none"> a. Employees have protection competency b. Employees have environmental services c. Teamwork level towards the environment d. Managers support employees to achieve environmentally friendly work e. Business has invested in employee training f. Environmental responsibility is stated in work instructions g. Business units encourage employees not to be included in waste issues
Green Human Resource Management (Y1) is an innovative approach to human resource performance and functions in an organization, where the environmental context is the basis of all initiatives undertaken.	<ul style="list-style-type: none"> a. Company designs products according to environmental desires b. Customer satisfaction regarding environmental protection is better than competitors c. Employees have environmental knowledge d. Company selects to employ employees who have environmental knowledge e. Employee selection takes environmental knowledge into account f. Environmental training is a priority g. Employees have an understanding of the environment in accordance with the objectives

Green Competitive Advantage (Y2) is a condition where a company can achieve several positions regarding environmental protection or green innovation, where competitors cannot imitate successful environmental strategies, resulting in the company gaining sustainable benefits from this environmental strategy.	h. Company performance regarding the environment is recognized as good by the community
	a. Business has Competitive Advantage with low costs
	b. The quality of products and services related to the environment is better
	c. Has the ability to develop and innovate
	d. Able to carry out environmental management
	e. Profitability is very superior
	f. Business growth is very proud
	g. Competitors cannot imitate the product

During the course of this study, data analysis was carried out using Structural Equation Model (SEM) analysis test. Accordingly, SEM-Partial Least Square (SEM-PLS) software was used to assess the measurement model (outer model) with validity and reliability tests, evaluate structural model (inner model) utilizing determination tests and t-tests, as well as examine the relationship between the independent and dependent variables through intervening variables, adopting the effect test.

Result And Discussion

The analysis of structural and measurement models in this study was carried out using SmartPLS 3, which was adopted to analyze the direct and indirect effects of the observed variables in accordance with the study objectives. Table 2 presents the results of the direct effect hypothesis test, which shows how H1, H2, and H4 were accepted, as evidenced by the obtained respective p-values smaller than 0.05. Meanwhile, H3 was rejected, because it had a p-value greater than 0.05.

Table 2: Direct Effect Hypothesis Test

	Original Sample (β)	Standard Deviation	T Statistics	P Values	Conclusion
Environmental Consciousness (X1) -> Green Intellectual Capital (X2)	0.717	0.052	13.854	0.000	Accepted
Green Intellectual Capital (X2) -> Green Human Resource Management (Y1)	0.878	0.025	35.585	0.000	Accepted
Green Intellectual Capital (X2) -> Competitive Advantage (Y2)	0.348	0.186	1.867	0.062	Rejected
Green Human Resource Management (Y1) -> Competitive Advantage (Y2)	0.423	0.179	2.363	0.019	Accepted

Source: SmartPLS 3 Output In 2023

As previously stated, SEM-PLS bootstrap was applied to test the indirect effect or mediation effect¹³, and the obtained results are presented in Table 3. The results signified the acceptance of H5, due to its associated significance value which was less than 0.05. Therefore, Green Human Resource Management (Y1) was observed to effectively mediate the relationship between Green Intellectual Capital (X2) and Competitive Advantage (Y2). These results prove how Green Intellectual Capital would significantly influence Competitive Advantage if Green Human Resource Management is efficiently adopted and implemented.

Table 3: Indirect Effect Hypothesis Test

	Original Sample (β)	Standard Deviation	T Statistics	P Values	Conclusion
Green Intellectual Capital (X2) -> Green Human Resource Management (Y1) -> Competitive Advantage (Y2)	0.371	0.159	2.329	0.020	Accepted

Source: SmartPLS 3 Output In 2023

The subsequent tests include R Square (R²), Q Square, and f Square tests. Typically, R Square shows the level of influence exerted by the exogenous variable on the endogenous variable. In this study, Environmental Consciousness variable (X1) had R Square value of 0.514 or 51.4%, implying the variable contributed 0.514 or 51.4% to Green Intellectual Capital, which is included in the moderate category.¹⁴ Accordingly, Green Intellectual Capital variable had R Square value of 0.771 or 77.1% which is included in the strong category. This signified that Green Intellectual Capital variable contributed 77.1% to Green Human Resource Management. Collectively, the contribution of Green Intellectual Capital and Green Human Resource Management to Competitive Advantage was observed to be 55.8%, reflecting that both variables had a moderate contribution to Competitive Advantage. The test results are presented in Table 4:

Table 4. Q Square, R Square , and Effect size of (f²)

	R Square	Q Square	f Square	Effect size f ²
Environmental Consciousness (X1) -> Green Intellectual Capital (X2)	0.514	0.442	1.059	Large
Green Intellectual Capital (X2) -> Green Human Resource Management (Y1)	0.771	0.498	3.360	Large
Green Intellectual Capital (X2) -> Competitive Advantage (Y2)			0.063	Small
Green Human Resource Management (Y1) -> Competitive Advantage (Y2)	0.558	0.361	0.093	Small

Source: SmartPLS 3 Output In 2023

¹³ Joe Hair, "Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool for Business Research," *European Business Review* 26 (2014): 106.

¹⁴ Joseph F. Hair, "When to Use and How to Report the Results of PLS-SEM," *European Business Review* 31, no. 1 (2019): 2.

The table also shows the magnitude of Q Square value, which is the value used to assess the predictive model. Environmental Consciousness variable had Q Square of 0.442, meaning that Environmental Consciousness served as a strong predictive model against Green Intellectual Capital. Green Intellectual Capital variable showed Q Square of 0.498 which is also included in the strong category against Green Human Resource Management. Similarly, the predictive model of Green Intellectual Capital and Green Human Resource Management collectively against Competitive Advantage produced a value of 0.361, which implied both variables had a strong predictive model against Competitive Advantage. Following the magnitude of Q Square, f Square values are also documented in Table 4. Based on predefined standards, a variable is considered to have a strong, moderate, or small effect if f Square value is 0.35, 0.15, and 0.02, respectively.¹⁵ In this study, f square value for Environmental Consciousness was 1.059, signifying a strong effect on Green Intellectual Capital. Green Intellectual Capital had f Square of 3.360, also reflecting a strong effect on Green Human Resource Management. However, Green Intellectual Capital on Competitive Advantage showed f Square of 0.063, signifying a small effect. Green Human Resource Management similarly had f Square of 0.093 on Competitive Advantage, which means it produced a small effect.

The Influence Of Environmental Consciousness On Green Intellectual Capital

The results of this study show that hypothesis I was accepted since Environmental Consciousness had a positive and significant influence on Environmental Knowledge Capital, as evidenced by the obtained p-value of 0.000 which is smaller than 0.05. The higher Environmental Awareness of an individual, the better the individual's knowledge of the environment. These results signified that the values contained in Environmental Awareness could increase and have an impact on the intellectual capital of a business about green environment.¹⁶

The findings, which emphasize how Environmental Awareness is positively related to Green Intellectual Capital, are in line with a previous exploration.¹⁷ Accordingly, from the administered questionnaire, some SMEs had clear and concrete environmental policies that were properly communicated and understood by respective employees. Business owners or managers can adopt the use of similar policies, which would in turn enhance the participation of employees in making positive contributions to the business, and foster the instillation of adequate and relevant knowledge regarding environmental health.

Based on the observation, the adoption of comprehensive environmental policies in workspaces will invariably enhance the competence level of employees, and this allows the demographic to provide high-quality services and products related to environmental

¹⁵ Imam Ghozali And Hengky Latan, *Partial Least Squares : Konsep, Teknik Dan Aplikasi Menggunakan Program SmartPLS 3.0, -2/E*, (Semarang: Badan Penerbit UNDIP, 2016).

¹⁶ A. A. Ngurah Bagus Jaya Krisnanda And I Nyoman Nurcaya, "Pengaruh Kesadaran Lingkungan Terhadap Persepsi Konsumen Dan Niat Beli Produk Lampu LED Philips Di Kota Denpasar," *E-Jurnal Manajemen Universitas Udayana* 8, no. 2 (2018): 1115.

¹⁷ Partiw Dwi Astuti And Luh Kade Datri, "Green Competitive Advantage: Examining The Role Of Environmental Consciousness And Green Intellectual Capital," *Management Science Letters* 11, no. 4 (2021): 1141.

protection. As supported by a previous study, high Environmental Awareness will motivate small business owners to provide comprehensive environmental policies for respective employees and make efforts towards improving employee competence related to environmental management and green innovation.¹⁸

Generally, businesses have been observed to adopt and implement green management mainly because of the demand from external factors to focus on environmental health.¹⁹ This elucidation is not in line with the results of Friedman, who emphasized that maximizing shareholder profits was the main goal of every business.²⁰ The primary goals of present-day businesses are not solely to maximize profits and operational efficiency but to meet external pressures for legitimacy. A prominent way to meet this goal and gain the trust of external institutions is to carry out green management in accordance with institutional theory. According to Carmi, Environmental Awareness can be defined as a conscious behavior towards the environment such as pro-environmental behavior. Following this, Enger and Smith defined Environmental Awareness as the science that helps people attain the value, skills, and knowledge required to live sustainably. This concept has been observed to play a significant role in facilitating the adoption of green practices that foster environmental health.²¹ The result is in line with a previous study, where it was stated that the enactment of international environmental regulations and popular environmentalism had a significant impact on companies around the world.²² Environmental Awareness is a trigger for organizational and technological change, as this will increase the demand for environmentally friendly products, which will in turn force businesses to carry out production in accordance with the demands, thereby adopting green technologies, processes, and business models.²³ In line with previous studies, this present investigation shows that corporate Environmental Awareness has a positive influence on Green Intellectual Capital.²⁴

The Influence Of Green Intellectual Capital On Green Human Resource Management

Intellectual Capital has significantly contributed to a better understanding of knowledge assets and serves as an initial step toward a more tangible and operational conceptualization of knowledge. Various studies have presented Intellectual Capital based

¹⁸ Erica Mina Okada And Eric L. Mais, "Framing The 'Green' Alternative For Environmentally Conscious Consumers," *Sustainability Accounting, Management And Policy Journal* 1, no. 2 (2010): 222.

¹⁹ A. W. Hofmann, "Mantle Geochemistry: The Message From Oceanic Volcanism," *Nature* 385, No. 6613 (1997): 219.

²⁰ Y. Datta, "Friedman Doctrine: Maximizing Profits Is Neither Good For Society Nor Even For The Shareholders," *Journal Of Economics And Public Finance* 7, no. 3 (2021): 153.

²¹ Wiwik Handayani, "Literature Review: Environmental Awareness And Pro-Environmental Behavior," In *Nusantara Science And Technology Proceedings*, (2021).

²² Yu-Shan Chen, Shyh-Bao Lai, And Chao-Tung Wen, "The Influence Of Green Innovation Performance On Corporate Advantage In Taiwan," *Journal Of Business Ethics* 67, (2006): 331.

²³ Ram Nidumolu, Coimbatore K. Prahalad, And Madhavan R. Rangaswami, "Why Sustainability Is Now The Key Driver Of Innovation," *Harvard Business Review* 87, no. 9 (2009): 56.

²⁴ N I Chaudhry, "The Role Of Environmental Consciousness, Green Intellectual Capital Management And Competitive Advantage On Financial Performance Of The Firms: An Evidence From Manufacturing Sector Of Pakistan," *Journal of Quality and Technology Management* 13, no. 2 (2016).

on different perspectives. The term "intellectual capital statement" emphasizes its role as capital. Some scholars define Intellectual Capital as the collective knowledge of a social community, including an organization or professional practice, while others interpret it as a human resource.²⁵

Over the past decade, the increase in industrial activities has been observed to be the primary cause of environmental concerns, and this issue has drawn professional attention toward sustainable practices. As a result, a prominent initiative namely intellectual capital management, particularly Green Intellectual Capital was introduced,²⁶ which comprises knowledge related to environmental management. In the current knowledge-based economy, intellectual capital typically possesses greater significance than financial capital. This is supported by a previous study, which stated how the recognition and utilization of intellectual capital enhanced the financial performance of businesses and contributed to organizational sustainability.²⁷ Green Intellectual Capital concept focuses on integrating intellectual capital with environmentally friendly principles, while Green Human Resource Management applies sustainability principles in human resource management processes. According to a previous investigation, these concepts facilitate practices that enable employees to contribute toward the sustainability goals of an organization.²⁸

Green Intellectual Capital is typically evaluated through three primary determinants namely Green Human Capital, Green Structural Capital, and Green Relational Capital. It is broadly defined as the ability, knowledge, creativity, awareness, and commitment of business actors toward environmental management.²⁹ Liu described this concept as the combination of an organization's green capabilities and knowledge to enhance Competitive Advantage.³⁰

As stated in another investigation, Green Human Capital refers to the intellectual contributions of employees, which comprises respective competence, skills, and adaptability. It is an intangible asset composed of employee knowledge, experience, expertise, and innovations, all of which can drive operational environmental sustainability.³¹ Based on observation, the most important factor in developing and strengthening green

²⁵ Bernard Marr, Gianni Schiuma, And Andy Neely, "Intellectual Capital – Defining Key Performance Indicators For Organizational Knowledge Assets," *Business Process Management Journal* 10, no. 5 (2004): 551.

²⁶ Yvonne Augustine Sudibyo And Karel Adam Sutanto, "Environmental Consciousness And Corporate Social Responsibility As Drivers Of Green Intellectual Capital," *International Journal Of Innovation* 13, no. 4 (2020).

²⁷ Kusuma Indawati Halim, "The Importance Of Intellectual Capital In Driving Firm Performance," *Accounting Analysis Journal* 12, no. 3 (2024): 190.

²⁸ Dadi Heryana, Muchammad Nurul Huda, And Amrie Firmansyah, "Green Intellectual Capital Dan Green Human Resource Management: Pendekatan Scoping Review," *Journal Of Law, Administration, And Social Science* 4, no. 3 (2024): 340.

²⁹ Fang Fang Chen, "Sensitivity Of Goodness Of Fit Indexes To Lack Of Measurement Invariance," *Structural Equation Modeling: A Multidisciplinary Journal* 14, no. 3 (2007): 464.

³⁰ Budhi Cahyono And Abdul Hakim, "Green Intellectual Capital And Competitive Advantage: The Moderating Effect Of Islamic Business Ethics," *Proceedings Of The 3rd Asia Pacific International Conference Of Management And Business Science (AICMBS 2019)*, (2020).

³¹ . Syahidun And Lenny C. Nawangsari, "The Effect Of Green Human Capital, Green Structural Capital And Green Relation Capital On Company Sustainability By Mediating Green Environment Management," *Academic Journal Of Interdisciplinary Studies* 11, no. 5 (2022): 154.

expertise in an organization is training. By investing in Green Human Capital, an organization can recognize and manage its invisible assets, such as knowledge and capabilities, enabling the successful implementation of green strategies in an increasingly competitive and dynamic business environment.³²

Structural Capital serves as the supporting infrastructure for Human Capital and is associated with an organization systems and frameworks that facilitate optimal intellectual output. This category of capital includes all non-individual organizational knowledge, such as databases, routines, and organizational culture, all of which contribute to value creation.³³ Green Structural Capital has a positive and significant relationship with Green Human Resource Management, largely due to the embedded environmental culture in the management systems of organizations. Additionally, elements such as circular economy programs and water management systems can be developed in Green Structural Capital to enhance an organization's capacity for environmental preservation.³⁴

Green Relational Capital represents the ability of an organization to maintain, strengthen, and enhance the quality of relationships with individuals and external entities to secure a competitive position in the market. It is a very important intangible asset that directly influences environmental performance.³⁵

The Influence Of Green Intellectual Capital On Green Competitive Advantage

Intellectual Capital is not a new concept for companies, and its significance in creating corporate value is well established. This is evidenced by the fact that numerous scholars have examined the asset through the lens of the resource-based view (RBV). For instance, Youndt and Snell elucidated that Intellectual Capital enhanced corporate performance by reducing costs, increasing consumer benefits, or a combination of both. It has also been widely recognized that intangible resources generate value for businesses, enabling each entity to maintain a competitive edge in the market.

Despite the growing relevance, Green Intellectual Capital has received limited attention since its introduction in 2008.³⁶ Chen was a pioneer in conceptualizing Green Intellectual Capital, defining it as Intellectual Capital related to environmental protection or green innovation at both the individual and organizational levels within a company." The figure further described the concept as the integration of environmental knowledge and green innovation and emphasized the ability of a business to model sustainability through Green Human Resource Management, with the aim of enhancing Competitive Advantage. Based on these definitions, Competitive Advantage of an organization can be derived from its intangible

³² Muhammad Lutfi Ali Fattah And Sidiq Permono Nugroho, "The Effect Of Green Intellectual Capital On Environmental Performance With Green Human Resource Management As A Mediating Variable" (2024).

³³ Fattah And Nugroho, "The Effect Of Green Intellectual.

³⁴ Bartolomé Marco-Lajara, Patrocinio Zaragoza-Sáez, and Javier Martínez-Falcó, "Does Green Intellectual Capital Affect Green Performance? The Mediation of Green Innovation," *Telematique* 21, no. 1 (2022).

³⁵ Fattah and Nugroho, "The Effect of Green Intellectual.

³⁶ Jing Yi Yong, M. Y. Yusliza, And Olawole Fawehinmi, "Green Human Resource Management: A Systematic Literature Review From 2007 To 2019," *Benchmarking: An International Journal* 27, no. 7 (2019).

assets related to environmental protection, as these resources are valuable, rare, and difficult to replicate. Green Intellectual Capital ensures compliance with international environmental regulations, addresses rising consumer Environmental Awareness, and contributes to corporate value creation.

Green Human Capital plays an important role in sustaining Green Intellectual Capital in an organization. Accordingly, trained employees, timely service, competence, reliable teamwork, and managerial support are fundamental elements that enable Green Human Capital to function effectively. Resources embedded in Green Human Capital have been observed to sustain a long-term Competitive Advantage, as the knowledge, skills, abilities, experience, attitudes, creativity, and commitment of employees significantly contribute to corporate sustainability. Studies has further shown that Green Intellectual Capital influenced organizational competitiveness, although the extent of its impact was found to vary depending on specific practices. Assessments of the relevance and practical implementation of Green Intellectual Capital strategies have also shown a strong correlation.³⁷

Green Human Resource Management And Green Competitive Advantage

Human Resource holds significant potential in advancing corporate sustainability.³⁸ However, its effectiveness in implementing environmental initiatives in a company depends on contributions from various organizational functions, particularly Human Resource Management.³⁹ Human resource function plays an important role in designing, executing, and ensuring the integration of sustainable business strategies across all levels of the organization. It can also support the formulation of environmental and social objectives, balancing these with traditional financial performance metrics. Additionally, human resource serves as a strategic partner in shaping corporate values and sustainability initiatives.

Regardless of the fact that Green Human Resource Management has gained increased attention, its focus areas and the relationships between disciplines remain diverse and fragmented. As a result, there is a need to develop a holistic framework that consolidates existing knowledge on Green Human Resource Management. This field currently lacks a comprehensive literature review that critically examines and synthesizes the expanding body of studies on Green Human Resource Management.

Conclusion

In conclusion, this study emphasized the important role of employee Environmental Awareness, which was fostered through continuous education and widespread socialization efforts to promote knowledge of the importance of environmental sustainability. Promoting

³⁷ Bombiak, "Effect Of Green Intellectual Capital Practices On The Competitive Advantage Of Companies," *Sustainability* 15.5 (2023): 4050.

³⁸ Charbel José Chiappetta Jabbour And Fernando César Almada Santos, "The Central Role Of Human Resource Management In The Search For Sustainable Organizations," *The International Journal Of Human Resource Management* 19, no. 12 (2008): 2133.

³⁹ Pascal Paillé, "The Impact of Human Resource Management on Environmental Performance: An Employee-Level Study," *Journal of Business Ethics* 121, no. 3 (2014): 451–466.

a clean and sustainable environment requires structured training programs for both employees and business managers. These trainings were observed to have a significant impact on enhancing knowledge related to environmental sustainability, commonly referred to as the green environment. Typically, environmental knowledge is structured around three key dimensions namely Green Human Capital, Green Structural Capital, and Green Relational Capital. These dimensions were observed to strongly influence human resource management by equipping it with the competence and competitiveness necessary to maintain an environmentally responsible business. However, Green Intellectual Capital alone did not possess sufficient capability to directly enhance competitiveness until it was rooted in a strong Environmental Awareness among employees. Human Resource Management similarly lacked competitive strength in cases where it was not founded on a solid understanding of environmental principles. The results showed that, in the future, organizations must cultivate environmentally conscious employees by providing education and training on sustainability. This approach can invariably enable Human Resource Management to develop more effective environmental strategies, thereby enhancing both business competitiveness and market positioning. Based on the observations made, organizations whose business models were integrated with environmental sustainability experienced increased sales. This is due to the perception that these organizations contributed to the achievement of sustainable development goals (SDGs). For future explorations, additional variables could be examined, particularly variables that are yet to be studied or implemented across manufacturing companies facing significant waste management and environmental challenges.

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Author Contributions Statement

R was responsible for collecting primary data, presenting it, and submitting the article to the journal. SR, RA and KS handled the collection of supporting data and language translation, while also contributing to data presentation and analysis. AA was in charge of language editing and also played a role in analyzing the study results.

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