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Green Intellectual Capital as a Support for Corporate Environmental Development—Polish Company Experience

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Abstract: Green intellectual capital (GIC) is a distinctive intangible asset that may assist organizations in pursuing sustainable development strategies. In Polish organizations, interest in this new concept is low. Analysis of the literature showed a lack of research regarding the implementation of GIC practices or their impacts on the sustainable development of organizations in Polish enterprises. In order to fill the detected research gap, the study covered 150 randomly selected Polish enterprises. The purpose of the research was to determine the impact of activities fostering GIC on the environmental development of companies in Poland and to identify major practices supporting GIC development. In addition, the author attempted to establish a correlation between the impact of individual practices oriented at GIC formation and their practical implementations in the analyzed enterprises. The first stage of the analysis focused on identification of activities leading to the accumulation of GIC implemented in Polish organizations. The second stage involved an assessment of the level of impact of actions contributing to GIC formation on the environmental development of the studied enterprises. During the third stage, the author investigated the relationship between the impact of individual practices oriented at GIC formation and their practical implementation in the analyzed organizations. The study demonstrated that actions supporting GIC formation have an uneven impact on corporate environmental development. Among the key factors identified by the author were environmental attitudes of employees in the working environment (such as paper and energy saving), environmental knowledge, and the implementation of innovative environmental projects. Furthermore, the author established a correlation between the impact assessments of activities leading to GIC accumulation and their practical implementations. The research demonstrated that activities assessed by respondents as more important are more often implemented in practice. The findings of the research may stimulate interest in GIC development and extend the scope of application of GIC-fostering practices over organizations operating in the energy sector.

Keywords: green intellectual capital; green human capital; green organizational capital; green relational capital; environmental development; sustainable development

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1. Introduction

Environmental management has recently become a major field of management [1]. In the contemporary business environment, sustainable companies succeed in the market, as they are able to secure resources and develop competencies to meet the challenges of environmental limitations [2]. Consequently, balance should be maintained amongeconomic, social, and environmental goals [3]. The motives behind the greening of economic activities are the growth in the awareness of and the responsibility for the conditions of the natural environment, the reinforcement of provisions on environmental protection, and the growing demand for ecological products [4].

Intellectual capital has recently come to the forefront as part of the search for methods thatimprovecorporate environmental effectiveness [5,6]. Intangible assets are commonly considered to be competitive advantages and as such may effectively stimulate achievement of sustainable corporate goals [7,8]. Despite diverse publications focusing on intellectual

capital (IC), its full potential for building sustainable organizations has not yet been 'unlocked'. This is demonstrated by a small number of studies on green intellectual capital (GIC) [9–11]. The prime focus of research is on the impact of IC on corporate performance and competitiveness. However, the relationship between green intellectual capital and sustainable development is under-investigated [12]. The limited availability of publications addressing the issue of green intellectual capital leadsone to assume that the concept is unknown, given the Polish conditions. This fact inspired the author to research the implementation of practices supporting GIC accumulation in young Polish enterprises.

A review of the literature revealed a gap in the field of empirical research on the impact assessment of GIC on the environmental development of Polish enterprises. The author intended to bridge the gap, at least to some extent.

The objective of this research article was to assess the rate of use of practices oriented at GIC formation to support corporate environmental development and establish a relationship between the impact assessments of individual practices leading to GIC accumulation and their implementation in enterprises. The analysis includes an identification of practices oriented at GIC formation and prioritization according to the environmentaldevelopmentimpact of anorganization.

In the course of the analyses, the author addressed the following research questions:

- What activities leading to the accumulation of GIC do Polish enterprises implement?
- What is the impact of these activities on the environmental development of Polish organizations?
- What GIC-fostering practices are key to the environmental development of organizations in the Polish reality?
- Is there a relationship between the impacts of GIC-fostering practices and their implementation in the analyzed Polish enterprises?

This research article contributes to the source literature by diagnosing a gap associated with GIC use as a tool for building sustainable enterprises. The results of the research may motivate managers to take corrective actions in the management process. In the author's opinion, the findings of the research may stimulate interest in GIC development and extend the scope of application of GIC-fostering practices to organizations operating in the energy sector. The energy sector now faces enormous challenges presented by a growing energy demand. At the same time, the EU and other countries around the world are introducing new regulations to reduce climate change and secure energy supplies. This opens up an opportunity to create a novel sustainable energy sector for future generations. Effective management of green intellectual capital can contribute to the improvement of energy efficiency and support the development of renewable energy sources. The identification of a correlation between GIC and corporate environmental development increases the understanding of how companies can achieve sustainable results through strategic management of their green intellectual capital.

2. Literature Review

2.1. Sustainable Development and Its Objectives

Given the harsh international regulations concerning environmental protection and high green awareness of consumers, it is critical to adopt an innovative approach to contemporary organization management. This will pave the way towards new paradigms, which will show the route to follow in order to attain a lasting competitive edge. Sustainable development is based on the pursuit of best economic performances, while respecting the natural environment and social development [13]. According to the World Commission on Environment and Development, sustainable development is development that satisfies the needs of the present generation without preventingthe ability offuture generations to meet their own needs (World Commission on Environment) [14]. The concept draws upon/accomplishes goals inthree areas:

- Environmental—stopping environment degradation and eliminating environmental threats;

- Economic—capturing the use of technical and technological solutions in order to satisfy material needs that, at the same time, constitute minimum threats to the environment;
- Social—eradicating famine and poverty; focusing on health protection, safety, and education development [15].

As noted by Komiyama and Takeuchi, within the concept of sustainable development, there is considerable pressure on liquidating growth barriers, poverty, implementing innovative solutions, environmental protection, and resource restoration, which arecrucial, given the new global conditions [16]. Sustainability means finding a balance between the developmental needs of the organization and environmental protection [17]. The main vector of sustainable development is the "green economy" [18].

In 2015, in New York, 193 UN states unanimously adopted a new 2030 agenda, consisting of 17 sustainable development goals and 169 sustainable development tasks. The agenda started a new era of international-level cooperation, obliging all states to undertake a number of sustainable development-centered actions. Countries must seek ways to prevent poverty, increase welfare, and meet the health, education, and sporting needs of people, while protecting the environment [19].

Implementing sustainable development goals requires corporate sustainability in economic, environmental, and social areas. Economic sustainability involves increasingcorporateprofitability through efficientuse of resources, effective projects and undertakings, and good management practices. Ecological sustainability requires protecting the environment by sparing the use of natural resources [20] and promoting renewable resources. The core of social sustainability is to recognize and consider the needs of the local population [21]. Sustainable development is an unending process of change management because it requires permanent modifications of habits, values, awareness, and behaviors of employees, consumers, company owners, decision-makers, and managers. A shift in ecological awareness is particularly relevant [22].

The subject literature demonstrates an increasing popularity of the thesis—that the key elements of the modern sustainable management strategy are intangible assets, above all, green intellectual capital [12,23]. This is due to the fact that research studies corroborate the positive impact of GIC on corporate environmental performance [24].

2.2. Green Intellectual Capital and Its Components

Green intellectual capital (GIC) is defined as a "total of knowledge about the use of the process of environmental management in order to gain competitive advantage" [25]. This knowledge is demonstrated in various ways. It includes knowledge present in employees, databases, internal relations, external relations, processes, or systems. GIC comprises three components [7,26,27]:

- Green human capital (GHC);
- Green organizational capital (GOC);
- Green relational capital (GRC).

The three GIC components interrelate and interact with eachanother [28].

Green human capital (GHC) is made up of employees who demonstrate knowledge, qualifications, and experience in the field of environmental protection, and who present environmentally-friendly attitudes [7]. GHC is a green workforce that understands, appreciates, and undertakes green initiatives. It is the staff who aim to develop eco-friendly working environments and who arecommitted to ecological principles, not only at work but also in their private lives [29]. These individuals represent extensive involvement and pride in green initiatives. They form a distinct group known as "green-collar workers", i.e., workers who are committed towardlimiting the negative natural environmental impacts of organizations [30,31]. These may be lower-, middle-, or higherlevelsof physical or intellectual employees. Green jobs include, among others, ecological auditors, ecological campaign management specialists, or energy efficiency advisors [32].

GHC are workers who [33]:

- Feel responsible for the condition of the natural environment;
- Use natural resources sparingly;
- Avoid activities leading to environment destruction;
- Engage in pro-ecological initiatives;
- Take care of green working conditions by limiting the amount of paper used in offices, use energy-saving equipment and renewable energy sources, and participate in recycling programs.

Green organizational capital (GOC), also known as structural capital, captures intangible and legal assets, databases, and invisible assets, such as green organizational culture, philosophy, systems of management of environmental knowledge, and processes, methods, and structures pertaining to environment protection and supporting green initiatives [7,8,24,34]. It provides the necessary support to GHC to achieve corporate environmental goals [9,35]. Unlike human capital, organizational capital is the property of the company and it may be traded, reproduced, or shared within the company [36].

Green organizational culture is a critical component of GIC. GOC is based on the regulations shaping the pro-ecological behaviors of employees [37]. Such culture fosters green practices among employees and that is why it plays a major role in the formation of sustainable companies [38,39]. As a result, green culture development is viewed as anunderlying condition for continuing the growth of the environmental effectiveness of an organization [40,41].

Another vital element of GOC isenvironmental management. It is oriented at product greening and implementing environmentally-friendly manufacturing processes. It is shaped by management boards and should encompass the following [42]:

- Priorities and objectives of environmental protection;
- Methods tomeet all legal requirements;
- Companyattitudes to environmental requirements concerning the recipients of goods and services;
- Direction of development of environmental requirements, with respect to the suppliers of raw materials and consumables;
- Rules toreduce the environmental burdens of companies and to produce goods;
- Methods to coordinate environmental policies with other company activities.

Pursuing any environment management strategy is associated with the need to conduct an environmental review, design action schemes, plan the execution of adopted tasks, and provide suitable staff.

The final component of GIC is green relational capital (GRC). GRC is defined as knowledge based on relationships with stakeholders. It is composed of relations with customers, suppliers, strategic partners, institutions, and other members of networks related to environment management and green innovations, which lead to sustainable operations [7,8,24]. These relationships are based on trust built up between partners through past interactions [43]. GRC is of major importance tothe formation of human and structural capital [44]. Both the organization and its stakeholders can benefit from relational capital development [45]. It enhances communication, augments willingness to cooperate, and spurs engagement in the joint creation of an added value [46–48]. According to Woo et al. [49], one effect of GRC is improved cooperation between the purchaser and the supplier in terms of environment protection. This is because GRC helps supply chain members share knowledge about ecological production. It facilitates cooperation in environmental protection, green innovation, and in developing business processes committed to reducing adverse environmental impacts [50,51].

One component of GRC is green reputation, also known as green corporate image or corporate environmental reputation [52,53]. Studies have demonstrated that green corporate image reinforces its industry position and simplifies competitive advantage development [54]. Other studies confirm the presence of positive correlations between corporate reputation and customer satisfaction and their loyalty [55]. Green reputation attracts customers who seek products that have positive impacts on the natural envi-

ronment, strengthening customer relations. Moreover, it stimulates cooperation with stakeholders who feature environmentally-friendly attitudes. All of the above contributed to GRC improvement.

Another constituent of green image development is green reporting connected with green bookkeeping [56]. According to Dilling [57], environmental accounting proves the environmental and social responsibility of companies, whereas green reporting is an element of construing relations with the stakeholders [58]. The portrayal of how (and to what extent) a given company contributes to sustainable development [59] is the foundation of communicating an organization's green actions to its internal and external stakeholders [60]. It serves as evidence of a company's commitment to environmental issues, whichspurs green corporate image development [61].

Another crucial factor in GRC formation is green marketing, which is a type of social marketing. It ensures that the links in the production chain perform their tasks in socially and environmentally responsible manners [62]. Vilkaite-Vaitone et al. [63] defined green marketing as strategic, tactical, and operational marketing activities that support the creation and delivery of green products. It encompasses, among other things, the promotion of packaging, and products that are safe for the environment [64]. Green marketing not only favorsa green corporate image, it also plays a crucial role in increasing the environmental awareness of partners in a network of relations.

Overall, green intellectual capital comprises a series of intangible assets thataffect each other within an organization. It includes diverse types of knowledge about environment protection collected both in the heads of the staff and in databases, procedures, systems, and relationships with stakeholders. Given the complex structure of GIC, an important research issue is to identify the GIC components thatmay have the greatest impacts on the sustainable development of organizations.

2.3. The Impact of Green Intellectual Capital on Corporate Development

Various authors have analyzed the contributions of intangible resources to the development of corporate effectiveness, including environmental performance. Asiaei and Jusoh analyzed the contribution of intellectual capital toward improving company performance in Tehran. Their research results demonstrated that three of the capital forms, i.e., human, structural, and relational capital, occupied central roles in improving company performance [65].

Chen, in his research conducted on a group of enterprises located in Taiwan, showed that all three forms of GIC have powerful impacts on their competitiveness [7]. In turn, Yadiati et al. focused on investigating the contribution of GIC and company reputations to the development of corporate environmental performance. They determined that strengthening all three forms of GIC increased the environmental effectiveness of enterprises [4].

Moreover, Yusliza et al., in their research carried out in Malesia, demonstrated that green intellectual capital had a positive impact on both economic performance and environmental and social results [24]. Sidik et al. arrived at similar conclusions when studying manufacturing enterprises in Indonesia. Their research confirmed the positive and profound impacts of GIC on the improvements of both corporate environmental performance and competitive advantage [66].

On the other hand, Yong et al. drew attention to the value of environmental practical placement in the area of human resource management. The authors argued that said practices might help organizations adjust their business strategies to environmental requirements [8]. Malik et al. likewise emphasized that green human resources management and green intellectual capital are major elements of sustainable business development [27].

Chen and Chang conducted a study amongst Taiwanese manufacturing companies. Their study findings showed that environmental ethics had a positive impact on the development of green relations and green innovation capability. Moreover, it was established that green human capital is involved in the development of positive relations amongcorporate environmental ethics, green relations, and green innovation performance [1]. Whereas

Lin and Chen reported that green knowledge sharing and green service innovations were related to green competitive advantages [67].

The study of Greek companies conducted by Papadas et al. asserted the role of green marketing in the development of permanent competitive advantages [68]. Moreover, a study conducted in Indonesia, involvinga group of companies listed on a stock exchange, showed that even though GIC had a positive impact on financial performance, its effect was minor [69].

To confirm or deny the findings of the analysis of the source literature, the author undertook a research study onthe relationships betweenGIC and corporate environmental development, in attempt to assess the contributions of individual practices focused on creating green intellectual capital, from the point of view of the potential to develop sustainable organizations. The author of the study considers sustainable development an environmental achievement.

3. Materials and Methods

The subject matters of this research involved practices leading to GIC formation across Polish enterprises. The purposes of the research wereto:

- Determine the impacts of activities fostering GIC on the environmental development of companies in Poland and to identify the practices thatare key from that point of view;
- Establish a correlation between the impacts of individual practices oriented at GIC formation and their practical implementations in the analyzed enterprises.

The author addresses the following research questions:

- What activities leading to GIC accumulation are of utmost importance to achieve the environmental development goals in Polish conditions?
- Is there a relationship between assessing the impacts of practices leading to GIC accumulation and implementation in the analyzed Polish enterprises?

The literature review conductedby the study author, which presents the research findings of other authors, suggests that green intangible assets might be key to develop sustainable organizations [4,24,66] and to improve competitiveness [7,8,24,65–67]. In view of the above literature findings, the author puts forward the following hypotheses:

Hypothesis 1. *Actions leading to GIC accumulation have diversified impacts on the environmental development of anorganization, which enables identification of key practices.*

Hypothesis 2. *There is a correlation between the importance rate of individual practices contributing to GIC accumulation, from the point of view of corporate environmental development and implementation in the studied organizations.*

The first hypothesis is based on the Pareto principle. It assumes that 80% of achieved effects come from 20% of actions. The key is to find 20% of the most important actions thatdetermine the success. When applying the principle to the field of GIC management, the author assumed that it was possible to identify a group of actions promoting GIC accumulation, having major impacts on the development of sustainable organizations and actions of secondary importance.

The second hypothesis suggests that knowledge about GIC-fostering practices among the managing staff plays a vital role in the process of implementation. This is due to the fact that managers find it hard to successfully pursue activities thatare beyond their competencies. Hypothesis 2 is linked to Hypothesis 1. Hypothesis 2 assumes that if managers deem an action to be crucial, in terms of accomplishing the environmental objectives of an organization, they are more likely to implement it.

The analysis included a literature review, diagnostic surveys, and statistical analyses. In the process of verifying the hypotheses, the author applied average measures and Spearman's rank correlation coefficient. This allowed establishing the correlation between

assessing the impacts of the practices in creating GIC (on the environmental development of enterprises) and their implementation. The correlation was presented using the linear regression model.

The diagnostic survey method allows one to learn a given social phenomenon, determine its range, scope, level, and intensity, and then allows one to rate it and design potential modifications. It is particularly helpful for examining opinions and attitudes of respondents. Acquiring information ona company's operations under intensive competition conditions is hampered by an organization's fear to lower itscompetitiveness. This is further applicable to information regarding intangible resources constituting a part of intellectual capital. Enterprises are under no obligation to publish the information in question in their annual reports. The use of the diagnostic survey method allowed the researcher to becomeacquainted with opinions of the studied managers concerning the range of implementation of GIC-fostering activities and their impact on the sustainable development of organizations on an anonymous basis. This information could not have been obtained otherwise. Ipso facto, the applied diagnostic survey method allowed accomplishing the adopted research objectives.

GIC is an elaborate category composed of intangible components thatare difficult to quantify. Due to the nonexistence of the financial methods of GIC estimation, the approach used in the course of the research was qualitative and based on a system of indices. The research model avails to follow the qualitative approach proposed by Edvinsson and Malone [70] and by Chen [7]. Eleven GHC indicators, twelve GOC indicators, and seven GRC indicators were applied in the analysis. A complete list of indicators is presented in Appendix A.

Reliability tests for the indicators applied in the diagnosis of the three GIC components—GHC, GOC, and GRC—were conducted with the use of the α Cronbach coefficient. The results are presented in Table 1. All constructs showed an $\alpha \geq 0.70$ reliability, which suggests high reliability and internal consistency of the applied measures [71,72].

Table 1. Results of Cronbach's Alpha.

GIC Components	Cronbach's Alpha
GHC	0.903
GOC	0.906
GRC	0.881

The survey was conducted in the year 2020 in 150 Polish enterprises. The method used in the study was CATI. In order to ensure the representativeness of the research, the author randomly selected twenty-five entities from each of the six regions of Poland. The respondents were managers employed in the surveyed companies. The characteristic features of the study population are shown in Table 2.

Table 2. Profiles of studied enterprises (N = 150).

Criterion	Number of Enterprises	Percentage
Employment number:		
50–249 employees	110	73.3
250–500 employees	37	24.7
Over 500 employees	3	2.0
Time on the market:		
up to 5 years	2	1.3
5–9 years	4	2.6
Over 9 years	144	96.0
Type of ownership:		
limited liability company	104	69.3
joint-stock company	30	20.0

Table 2. *Cont.*

Criterion	Number of Enterprises	Percentage
general partnership	10	6.7
limited partnership	3	2.0
private ownership	3	2.0
Scope of operations:		
international	86	57.3
European	32	21.3
national	26	17.3
regional	1	0.7
local	5	3.4
Capital structure		
Polish	111	74.0
foreign	23	15.3
mixed	16	60.7

Medium-sized enterprises with 50–249 employees constituted the largest percentage of the surveyed population. In principle, the companies were limited liability companies that conducting business activities on a global scale. Enterprises with domestic capital dominated in the capital structure.

The study covered production companies. The production sector is one of the main generators of sustainable development-related difficulties. Therefore, managers should view environmentalorientation and GIC reinforcement as both necessary and priorities.

4. Results

The impacts of the analyzed practices on the environmental development of the surveyed enterprises wereassessed using a five-point Likert scale. The results of the analysis are presented in Table 3.

Table 3. The impacts of activities fostering GIC on the environmental development of the studied companies.

Activity No.	Symbol of Activity	Aggregate Assessment of Impact (Points)	Mean Impact (Points)	Median	Modal Value	Standard Deviation	Asymmetry	Kurtosis
1	HC1	468	3.12	3.00	3	1.215	−0.392	−0.671
2	HC2	496	3.31	4.00	4	1.181	−0.593	−0.551
3	HC3	362	2.41	2.00	1	1.312	0.390	−1.096
4	HC4	315	2.10	2.00	1	1.230	0.706	−0.706
5	HC5	305	2.03	1.00	1	1.255	0.803	−0.737
6	HC6	350	2.33	2.00	1	1.324	0.384	−1.264
7	HC7	360	2.40	2.00	1	1.306	0.378	−1.127
8	HC9	284	1.89	1.00	1	1.165	1.010	−0.096
9	HC10	265	1.77	1.00	1	1.114	1.183	0.192
10	HC11	222	1.48	1.00	1	0.932	1.924	2.877
11	HC12	227	1.51	1.00	1	0.974	2.035	3,561
12	OC1	401	2.67	3.00	3	1.240	−0.019	−1.128
13	OC2	427	2.85	3.00	3	1.309	−0.148	−1.120
14	OC3	424	2.83	3.00	4	1.345	−0.148	−1.326
15	OC4	364	2.43	2.00	1	1.444	0.453	−1.250
16	OC5	388	2.59	3.00	1	1.362	0.138	−1.398
17	OC6	393	2.62	3.00	1	1.427	0.176	−1.374
18	OC7	300	2.00	1.00	1	1.237	0.819	−0.734
19	OC8	451	3.01	3.00	4	1.459	−0.222	−0.734
20	OC9	334	2.23	2.00	1	1.291	0.517	−1.382
21	OC10	351	2.34	2.00	1	1.340	0.441	−1.172

Table 3. *Cont.*

Activity No.	Symbol of Activity	Aggregate Assessment of Impact (Points)	Mean Impact (Points)	Median	Modal Value	Standard Deviation	Asymmetry	Kurtosis
22	OC11	341	2.27	2.00	1	1.326	0.500	−1.128
23	OC12	378	2.52	3.00	1	1.202	−0.012	−1.125
24	RC1	394	2.63	3.00	1	1.403	0.128	−1.415
25	RC2	307	2.05	1.00	1	1.318	0.877	−0.538
26	RC3	289	1.93	1.00	1	1.316	0.996	−0.575
27	RC4	305	2.03	1.00	1	1.271	0.771	−0.835
28	RC5	296	1.97	1.00	1	1.215	0.780	−0.825
29	RC5	364	2.43	2.00	1	1.377	0.319	−1.378
30	RC7	283	1.88	1.00	1	1.220	1.041	−0.331

Reviewing the analysis of the figures shown in Table 3, we can conclude that GIC-forming activities have an uneven impact on the environmental development of the studied organizations. The impact ratings of individual activities ranged from 1.48 to 3.31. The respondents considered activity no. 2, i.e., employees showing green behavior at work (e.g., paper and energy saving), to have the most impact on the environmental development of the studied enterprises (the average impact was 3.31). Other activities the respondents found essential for environmental organization development were:possessing environmental knowledge (the average impact of which was 3.12), implementing innovative environmentally-friendly projects (including technological solutions, the average impact of which was assessed at 3.01), including environmental goals in company strategies (with an impact average of 2.85), implementing environmental management (with an impact average of 2.83), updating employees on environmentally-friendly activities pursued by the organization (with an impact average of 2.67), complyingwith the principles of environmental protection in the product distribution process (the average impact of which was 2.63), environmental audits (the average impact of which was 2.62).

On the contrary, according to the respondents, the following actions had the least impacts on the environmental development of organizations (modal value 1): including environmental criteria in the process of employee recruitment (average impact 1.48), giving preference tocandidates with environmental competencies (average impact 1.51), informing employees about their environmental performances (average impact 1.77), supporting environmental initiatives (average impact 1.88), incentives to boost "green" competencies (average impact 1.89), the use of green marketing (average impact 1.93), providing reports about the environmental impacts to external stakeholders (average impact 1.97).

Against this background, implementing individual practices has become a crucial research issue. In the course of this research, the author attempted to examine the relationship between the impactratings of GIC-forming activities on the environmentaldevelopment of enterprises and their practical implementation. Table 4 demonstrates figures thatwere the bases for the calculations of the numbers of enterprises pursuing individual practices and the assessments of their impacts on environmentaldevelopment.

Table 4. The impact of activities fostering GIC on the environmental development of organizations and their implementation in Polish enterprises.

Activity No.	Aggregate Assessment of Activity Impact on the Environmental Development of Organization (Variable X)	Number of Enterprises Performing the Activity (Variable Y)	Rank X	Rank Y
1	468	122	2	2
2	496	137	1	1
3	362	77	13	12/13

Table 4. *Cont.*

Activity No.	Aggregate Assessment of Activity Impact on the Environmental Development of Organization (Variable X)	Number of Enterprises Performing the Activity (Variable Y)	Rank X	Rank Y
4	315	55	19	22
5	305	54	21	23
6	350	77	16	12/13
7	360	92	14	8/9
8	284	43	26	27
9	265	35	28	28
10	222	27	30	29
11	227	23	29	30
12	401	103	6	3
13	427	101	4	4/5/6
14	424	101	5	4/5/6
15	364	70	12	16
16	388	100	9	7
17	393	92	8	8/9
18	300	52	23	24/25
19	451	59	3	21
20	334	75	18	15
21	351	67	15	18
22	341	101	17	4/5/6
23	378	86	10	11
24	394	90	7	10
25	307	61	20	20
26	289	52	25	24/25
27	305	68	22	17
28	296	66	24	19
29	364	76	12	14
30	283	50	27	26

In order to establish the relationship between the impact assessments of practices on environmental development and their implementation, the author calculated Spearman's rank correlation coefficient (Table 4). The r = 0.878 rank correlation coefficient demonstrates a very strong relationship. This indicates that the pursued practices are those viewed as essential for the policy of sustainable development by the management, as expressed by the high rating of their impact.

Figure 1 represents a linear regression function. The analysis of regression was conducted with the application of the SPSS program based on data shown in Table 4. Variable X represents the managers' impactratings of actions leading to GIC accumulation on the environmental development of organizations. Variable Y stands for the number of enterprises pursuing the individual practices related to GIC development.

The linear regression model has the form of the equation:

$$Y = 0.354x - 49.66$$

The coefficient 0.354 indicates that, a 1-point impact growth in the impact of an activity on the environmental development of the organization results in an average increase of its realization by 0.354. The coefficient of determination $r^2 = 0.771$ means that, in 77.1%, the changeability of the number of enterprises pursuing GIC-fostering activities was explained by the estimated regression function. The coefficient of linear indetermination (1 − 0.771 = 0.229 = 22.9%) informs us that in the studied sample of organizations only 22.9% of changeability of the number of companies implementing GIC-fostering activities was not accounted for by the variability of the rating of their impact on the environmentaldevelopment of enterprises.

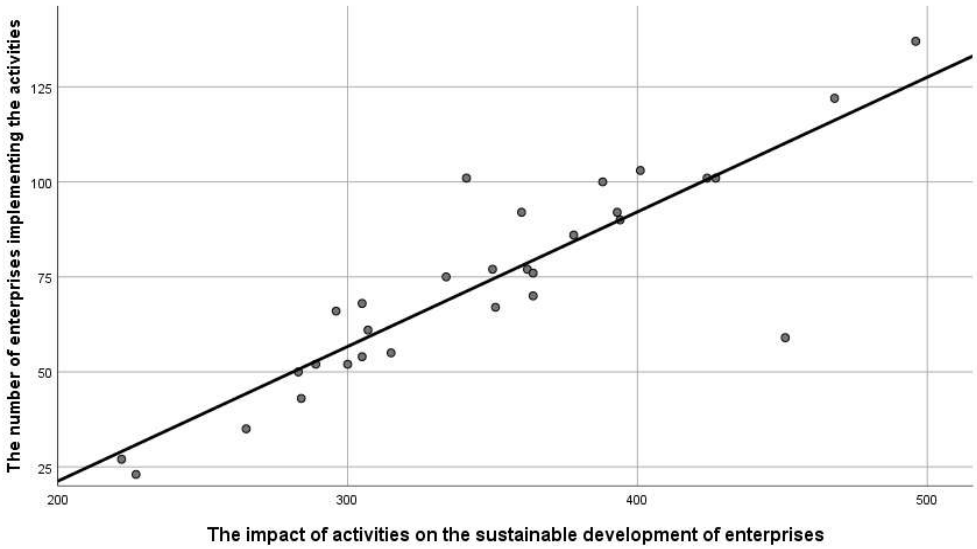

Figure 1. The correlation between the impacts of activities leading to the accumulation of GIC on the environmental development of the organization, and their implementations in the surveyed companies.

The regression function may be the foundation toforecast the implementation of GIC practices in the future. The established correlation allows the conclusion that an increase in the impactrating of GIC-forming activities may generate an increase in the level of their practical implementation. Therefore, popularization of knowledge about the GIC model among Polish managers can play a key role here.

5. Discussion

The effect of GIC on the environmentaldevelopment of organizations was confirmed by many authors. The studies by Yadiati et al., which covered Indonesian companies, demonstrated that green intellectual capital had a positive and essential impact on environmental performance. It was determined that a unit increase in green intellectual capital generated a 0.494 increase of environmental effectiveness inIndonesian-based international companies. Furthermore, corporate reputation, which is a key element of GRC, was recognized as another principal factor. It was found that a unit increase in organizational reputation also brought about a positive increase (by a 0.424 unit) in environmental performance in Indonesian multinational firms [4].

In addition, studies by Yusliza et al. conducted across 112 manufacturing companies in Malaysia showed that the role of green intellectual capital in sustainable performance was considerable [24]. It was determined that green intellectual capital had a positive impact on both economic performance and environmental and social results. Economic performance pertains to the reduction of the cost of purchased materials, energy consumption, waste processing, and penalties for pollution and emissions [73]. Social results correspond to the improvement of stakeholders' wellbeing, community health and safety, employee health and safety, and the mitigation of risks for society in general [74]. Environmental results are associated with the limitation of pollution and emissions, energy consumption, or hazardous material use [75].

Recent studies by Malik and et al. [27] also highlight the importance of GHC in the development of sustainable organizations. The research covered 510 small- and medium-sized enterprises employing between 10 and 250 employees in Pakistan. The studies proved that all GIC components, i.e., GHC, GOC, and GRC, had positive and considerable impacts on the sustainable performances of Pakistani companies. A more in-depth analysis was conducted with respect to the following elements of green practices of human capital management: green analysis and job description, green recruitment and selection, green training, green performance evaluation, and green rewards. The studies further demon-

strated that green recruitment and selection, as well as green rewards, were most central to the formation of sustainable organizations [27].

The importance of green motivation was attested by the studies conducted by Forman and Joergensen.The authors proved that green motivation increased employee involvement in pro-environmental initiatives [76]. Moreover, studies carried out in 376 Pakistani companies demonstrated the importance of educational practices in achieving the goals of green management [77].

Dangelico [78], in turn, showed a key role of green management teams in the enhancement of company reputation and environmental effectiveness. Moreover, Gross-Gołacka et al., in a study involvinga group of 1041 small- and medium-sized enterprises in Poland, demonstrated that HC had the largest impact on sustainable business [79].

The studies carried out by Chen and Chang showed a direct link between sustainable development and green human capital [1]. Green staff members significantly contribute toward increasing the environmental effectiveness and sustainable development of organizations [80]. They initiate environmental innovation, which not only brings about novel products, technologies, and processes, but also increases natural resource use in the economy and softens any adverse environmental impacts. As a consequence, energy and material intensity of manufacturing processes start to reduce, soil, water, air, and noise pollution, resulting inless pollution or less hazardous materials, whereas waste, water, and substances are recovered or reused [81].

The special role of GHC in constructing sustainable organizations stems from the fact that "environmental knowledge and skills are the foundation of implementation of cleaner manufacturing strategies" [82]. Organizations benefit from the knowledge and skills of their employees in terms of stimulating development based on decreased energy consumption, less production waste, and reduced material waste.

However, not all findings related to the role of GHC in the development of sustainable organizations are unequivocal. Studies conducted among 168 small- and medium-sized manufacturing enterprises in Malaysia did not confirm the key role of HC in the formation of sustainable organizations. Nonetheless, it was determined that green structural capital, green relational capital, and sustainable businesses were positively correlated [83]. Researchers exploring this issue emphasized that human capital alone is not sufficient to achieve permanent and sustainable results. To do so, one needs to include both green structural and green relational capital. Intangible assets, such as green organizational culture, technologies, databases, trademarks, and copyrights, are vital to sustainable action. Other key actors in sustainable performance are relations with creditors, suppliers, customers, associations, and other stakeholders [24]. The low impact of green recruitment was also confirmed by studies conducted by Owino and Kwasira and Guerci et al. [84,85]. In view of the established discrepancies related to HC, further research on the role of GIC in the development of sustainable organizations, above all, with respect to the human component, is required.

6. Conclusions

Intellectual capital is one of the principal resources for the provision of the market value in aknowledge-based economy. A special type of IC is GIC, the formation of which requires an environmental approach to human, organizational, and relational resources. GIC may constitute the basis for the construction of environmentally-friendly organizations. This was endorsed in empirical studies.

This study validated the thesis that actions supporting GIC formation have an impact on the environmentaldevelopment of organizations, whereas thisimpact isuneven and depends on the types of practices. The studies conducted by the author demonstrate that Polish managers did not consider GIC impact as highly significant to achieve the environmental objectives for their organizations. Their rating was below average on a 5-point scale.

Given the average impactrating of GIC-fostering practices on the environmentaldevelopment of organizations (2.32), the studied managers opined that GIC had a moderate effect on the environmental development of organizations. The managers did not consider all practices as equally important, which justifies the adopted Hypothesis 1. The ones they considered as major were activities related to GHC-development, i.e., showing green behaviors in the workplace (such as paper and energy savings) and environmental knowledge.

Furthermore, a correlation was identified between the rates of importance of individual practices contributing to GIC formation from the point of view of corporate environmentaldevelopment and their implementation in the studied enterprises. Hypothesis 2 was positively verified. It was found that practices assessed as more important to the environmental development of anorganization were more often implemented. It is necessary to strengthen the importance of practices leading to GIC accumulation among managers. The broader the manager's knowledge about GIC, the more involved the manager becomes in the management of capital.

Empirical studies have demonstrated that there is gap in the scope of implementation of GIC-fostering practices. Polish enterprises do not implement the full range of activities supporting the implementation of environmental goals. We can conclude that implementation of the GIC model is in the initial phase. Further research to identify the reasons behind the limited implementation of the GIC model in Poland is required. One of the possible causes may be the deficit of tools used to measure, monitor, and present GLC. No commonly accepted and universal model of GIC measurement has been developed. This could be an impediment to the rating of the level of GIC in enterprises and a barrier to effective green intellectual management. Terminological issues continue to be unorganized, generating difficulties in monosemantic GIC definition, identification, and external reporting. The principal limitation is, however, the fact that the value of GIC is hard to assess, for it is composed of a number of intangible assets, which are challenging to quantify. Green intellectual capital measurement is imperative to effective GIC management. Hence, the tools and methods of GIC measurement, as well as further investigations into its role in the development of sustainable organizations, require correction. Finally, it is essential to enhance manager competences by incorporating green intellectual capital management in university programs in economics.

This research study focuses on the identification of managerial views, concerning the role of green intellectual capital in pursuance of corporate environmental goals. It contributes both to theory and practice, by identifying a gap in the implementation of GIC-fostering practices. This research article identifies the underlying impediment to GIC applications to achieve environmentalorganizational goals, i.e., underestimating actions supporting GIC accumulation. It suggests the need to change managerial attitudes in that respect. The conducted research raises awareness aboutthe importance of managerial GIC competence development for a better use of intangible green asset potential to create sustainable enterprises. It suggests the need to disseminate knowledge about GIC through, inter alia, the inclusion of the issue in the curricula of economic schools of higher education.

7. Limitations and Future Research

When analyzing the presented research outcomes, one should also consider the limitations of the analyses. The latter include high subjectivity of respondents' opinions based on convictions rather than any certain activities undertaken in the field of GIC accumulation and the limited research sample. Another issue is a more qualitative approach to the evaluation of GIC impacts on environmental performance, not taking into account objective quantitative measures, which are often difficult (or even impossible) to design due to GIC specifics. Furthermore, one should keepin mind that some managers donot havesuitable competencies to conduct reliable evaluations on the effects of activities leading to GIC accumulation, concerning the accomplishments of theorganization's environmental goals.

However, the research findings open up new research areas. Amongst them, strategic and operational factors thatdetermine the range and effectiveness of implementing GIC-

fostering practices in order to improve corporate environmental performance. The research will be continued in the future, having regard for a more extensive and precisely selected research sample and measurements using more objective quantitative indicators. Future research may also encapsulate an assessment of the maturity of green intellectual capital management with inter-sectoral comparisons.

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Appendix A

Table A1. List of GIC indicators.

Activity Number	Symbol	Activity
1	HC1	Employees have environmental knowledge.
2	HC2	Employees care about the environment in the workplace (e.g., paper or energy saving).
3	HC3	Employees develop environmental knowledge and skills through training.
4	HC4	The environmental knowledge and skills of employeesare systematically assessed.
5	HC5	Employees receive additional awards for the implementation of ecological projects.
6	HC6	The responsibilities ofemployees include environmental protection tasks.
7	HC7	The organization applies penalties to employees who do not comply with environmental protection regulations.
8	HC8	The company stimulates the development of green competences.
9	HC9	Employees are informed about their environmental performances.
10	HC10	Environmental knowledge and skills are considered in recruitment.
11	HC11	Green competences are important criteria for assessing applicants.
12	OC1	The organization has an information system on the implemented pro-ecological activities.
13	0OC2	The organization's strategies take environmental objectives into account.
14	OC3	The company implements an environmental management system.
15	OC4	The company employs a specialist in environmental management.
16	OC5	The company implements the principles of employee behavior in relation to environmental protection.
17	OC6	Environmental audits are systematically implemented in enterprises.

Table A1. *Cont.*

Activity Number	Symbol	Activity
18	OC7	The company implementsa motivation system to achieve environmental goals.
19	OC8	The company has environmentally-friendly technologies.
20	OC9	The company builds a green corporate culture.
21	OC10	The company runs an environmental analysis of the product life cycle.
22	OC11	The organization creates conditions that stimulate the sharing of ecological knowledge.
23	OC12	The mission of the organization considers environmental values.
24	RC1	The principles of environmental protection are followed in the process of product distribution.
25	RC2	An important criterion in selecting a business partner involves applying the principles of environmental protection.
26	RC3	The organization encourages clients to be pro-ecological by developing green marketing.
27	RC4	The organization decides to collaborate with suppliers that meet the environmental criteria.
28	RC5	The organization publishes reports on the environmental impact of its activities.
29	RC6	The company attaches importance to the creation of a green image.
30	RC7	The organization supports environmentally-friendly initiatives in the area.

References

1. Chen, Y.-S.; Chang, C.-H. Utilize structural equation modeling (SEM) to explore the influence of corporate environmental ethics: The mediation effect of green human capital. *Qual. Quant.* **2013**, *47*, 79–95. [CrossRef]
2. Menguc, B.; Ozanne, L.K. Challenges of the "green imperative": A natural resource-based approach to the environmental orientation—Business performance relationship. *J. Bus. Res.* **2005**, *58*, 430–438. [CrossRef]
3. Colbert, B.A.; Kurucz, E.C. Three conceptions of triple bottom line business sustainability and the role of HRM. *Hum. Resour. Plan.* **2007**, *30*, 21–29.
4. Yadiati, W.; Nissa, N.; Paulus, S.; Suharman, H.; Meiryani, M. The role of green intellectual capital and organizational reputation in influencing environmental performance. *Int. J. Energy Econ. Policy* **2019**, *9*, 261–268. [CrossRef]
5. Tonial, G.; Cassol, A.; Selig, P.M.; Giugliani, E. Intellectual capital management and sustainability activities in Brazilian organizations: A case study. In *Intellectual Capital Management as a Driver of Sustainability*; Matos, F., Vairinhos, V., Selig, P.M., Edvinsson, L., Eds.; Springer International Publishing: Cham, Switzerland, 2019; pp. 119–138.
6. Guerrero-Baena, M.D.; Gómez-Limón, J.A.; Fruet, J.V. A multicriteria method for environmental management system selection: An intellectual capital approach. *J. Clean. Prod.* **2015**, *105*, 428–437. [CrossRef]
7. Chen, Y.S. The positive effect of green intellectual capital on competitive advantages of firms. *J. Bus. Ethics* **2008**, *77*, 271–286. [CrossRef]
8. Yong, J.Y.; Yusliza, M.Y.; Ramayah, T.; Jabbour, C.J.; Sehnem, S.; Mani, V. Pathways towards sustainability in manufacturing organizations: Empirical evidence on the role of green human resource management. *Bus. Strategy Environ.* **2019**, *29*, 212–228. [CrossRef]
9. Chang, C.H.; Chen, Y.S. The determinants of green intellectual capital. *Manag. Decis.* **2012**, *50*, 74–94. [CrossRef]
10. Rezaei, S.; Izadi, M.; Jokar, I. The relationship between green intellectual capital and competitive advantages. *Int. Bus. Manag.* **2016**, *10*, 4743–4748. [CrossRef]
11. Yusoff, Y.M.; Omar, M.K.; Zaman, M.D.K. Practice of green intellectual capital. Evidence from Malaysian manufacturing sector. In *IOP Conference Series: Materials Science and Engineering, Proceedings of the 1st International Postgraduate Conference on Mechanical Engineering (IPCME2018), Pahang, Malaysia, 31 October 2018*; UMP Pekan: Pahang, Malaysia, 2019; Volume 469, pp. 1–8.

12. Omar, M.K.; Yusoff, Y.M.; Zaman, M.D.K. Role of green intellectual capital on business sustainability. *World Appl. Sci. J.* **2017**, *35*, 2558–2563.
13. Łabądź, I. Rozwójzrównoważonyitrwały [Sustainable and Permanent Development]. Available online: https://www.oko.bielsko.pl/rozwoj_zrownowazony,spoleczenstwo_obywatelskie.html (accessed on 30 March 2022).
14. Report of the World Commission on Environment and Development. 4 August 1987, p. 57. Available online: https://digitallibrary.un.org/record/139811#record-files-collapse-header (accessed on 30 March 2022).
15. Grapp, T. *Nachhaltigkeit und Kooperation*; Verlag Peter Lang: Frankfurt am Main, Germany; Berlin, Germany; Bern, Switzerland; Bruxelles, Belgium; New York, NY, USA; Oxford, UK; Wien, Australia, 2001; pp. 204–213.
16. Komiyama, H.; Takeuchi, K. Sustainability science: Building a new discipline. *Sustain. Sci.* **2006**, *1*, 1–6. [CrossRef]
17. Adamczyk, J.; Nitkiewicz, T. *Programowanie Zrównoważonego Rozwoju Przedsiębiorstw [Programming the Sustainable Development of Enterprises]*; PWE: Warszawa, Poland, 2007; p. 27.
18. Mikhno, I.; Koval, V.; Shvets, G.; Garmatiuk, O.; Tamošiūnienė, R. Green economy in sustainable development and improvement of resource efficiency. *Central Eur. Bus. Rev.* **2021**, *10*, 99–113. [CrossRef]
19. Transforming Our World: The 2030 Agenda for Sustainable Development. Available online: https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E (accessed on 30 March 2022).
20. Koval, V.; Mikhno, I.; Udovychenko, I.; Gordiichuk, Y.; Kalina, I. Sustainable natural resource management to ensure strategic environmental development. *TEM J.* **2021**, *10*, 1022–1030. [CrossRef]
21. Jabłoński, A. Modele zrównoważonego biznesu a koncepcja VBM oraz CSR [Sustainable business models and the concept of VBM and CSR]. *PrzedsiębiorstwoPrzyszłości* **2010**, *2*, 40–49.
22. Matusiak, B.; Matejun, M.; Różańska-Bińczyk, I. Koncepcja Zrównoważonego RozwojuJako Środowisko Implementacji Praktyk Green Hr We Współczesnych Przedsiębiorstwach [The Concept of Sustainable Development as an Environment for Implementing Green HR Practices in Modern Enterprises]. Available online: https://slz.sgh.waw.pl/wp-content/uploads/2020/11/011_II_02.pdf (accessed on 29 March 2022).
23. Akhtar, C.S.; Ismail, K.; Ndaliman, M.A.; Hussain, J.; Haider, M. Can intellectual capital of SMEs help in their sustainability efforts. *J. Manag. Res.* **2015**, *7*, 82–97. [CrossRef]
24. Yusliza, M.-Y.; Yong, J.Y.; Tanveer, M.I.; Ramayah, T.; Faezah, J.N.; Muhammad, Z. A structural model of the impact of green intellectual capital on sustainable performance. *J. Clean. Prod.* **2020**, *249*, 119334. [CrossRef]
25. López-Gamero, M.D.; Zaragoza-Sáez, P.; Claver-Cortés, E.; Molina-Azorín, J.F. Sustainable development and intangibles: Building sustainable intellectual capital. *Bus. Strategy Environ.* **2011**, *20*, 18–37. [CrossRef]
26. Allameh, S.M. Antecedents and consequences of intellectual capital: The role of social capital, knowledge sharing and innovation. *J. Intellect. Cap.* **2018**, *19*, 858–874. [CrossRef]
27. Malik, S.Y.; Cao, Y.; Mughal, Y.H.; Kundi, G.M.; Mughal, M.H.; Ramayah, T. Pathways towards sustainability in organizations: Empirical evidence on the role of green human resource management practices and green intellectual capital. *Sustainability* **2020**, *12*, 3228. [CrossRef]
28. Kamukama, N. Intellectual capital: Company's invisible source of competitive advantage. *Compet. Rev. Int. Bus. J.* **2013**, *23*, 260–283. [CrossRef]
29. Ahmad, S. Green human resource management: Policies and practices. *Cogent Bus. Manag.* **2015**, *2*, 1030817. [CrossRef]
30. Green, G.P.; Dane, A. *Green-Collar Jobs*; University of Wisconsin's Department of Community and Environmental Sociology: Madison, WI, USA, 2010.
31. Kryk, B. Time for green collars. *Econ. Environ.* **2014**, *3*, 10–20.
32. Bombiak, E.; Marciniuk-Kluska, A. Green human resource management as a tool for the sustainable development of enterprises: Polish young company experience. *Sustainability* **2018**, *10*, 1739. [CrossRef]
33. Huselid, M.A.; Becker, B.E. Comment on "measurement error" in research on human resource and firm performance: How much error is there and how does it influence effect size estimates? *Pers. Psychol.* **2000**, *53*, 835–854. [CrossRef]
34. Arsawan, I.W.E.; Koval, V.; Rajiani, I.; Rustiarini, N.W.; Supartha, W.G.; Suryantini, N.P.S. Leveraging knowledge sharing and innovation culture into SMEs sustainable competitive advantage. *Int. J. Prod. Perform. Manag.* **2022**, *71*, 405–428. [CrossRef]
35. Jardon, C.M.; Dasilva, A. Intellectual capital and environmental concern in subsistence small businesses. *Manag. Environ. Qual.* **2017**, *28*, 214–230. [CrossRef]
36. Mention, A.; Bontis, N. intellectual capital and performance within the banking sector of Luxembourg and Belgium. *J. Intellect. Cap.* **2013**, *14*, 286–309. [CrossRef]
37. Chang, C.H. Proactive and reactive corporate social responsibility: Antecedent and consequence. *Manag. Decis.* **2015**, *53*, 451–468. [CrossRef]
38. Yang, Z.; Sun, J.; Zhang, Y.; Wang, Y. Green, green, and it's green: A triad model of technology, culture, and innovation for corporate sustainability. *Sustainability* **2017**, *9*, 1369. [CrossRef]
39. García-Machado, J.J.; Martínez-Ávila, M. Environmental performance and green culture: The mediating effect of green innovation. An application to the automotive industry. *Sustainability* **2019**, *11*, 4874. [CrossRef]
40. Azzone, G.; Noci, G. Identifying effective PMSs for the deployment of "green" manufacturing strategies. *Int. J. Oper. Prod. Manag.* **1998**, *18*, 308–335. [CrossRef]

41. Fernández, E.; Junquera, B.; Ordiz, M. Organizational culture and human resources in the environmental issue: A review of the literature. *Int. J. Hum. Resour. Manag.* **2003**, *14*, 634–656. [CrossRef]
42. Wiśniewska, A. Pro-ecological strategies in enterprise management. In *Ecological and Landscape Studies in Programming Sustainable Development. Review of Polish Experiences on The threshold of Integration with the European Union*; Kistowski, M., Ed.; University of Gdańsk: Gdańsk, Poland, 2004; pp. 91–98.
43. Villena, V.H.; Revilla, E.; Choi, T.Y. The dark side of buyer-supplier relationships: A social capital perspective. *J. Oper. Manag.* **2011**, *29*, 561–576. [CrossRef]
44. De Pablos, P. Intellectual capital reporting in Spain: A comparative view. *J. Intellect. Cap.* **2003**, *4*, 61–81. [CrossRef]
45. Pearse, N. The role of experiences in creating and developing intellectual capital. *Manag. Res. News* **2009**, *32*, 371–382. [CrossRef]
46. Carey, S.; Lawson, B.; Krause, D.R. Social capital configuration, legal bonds and performance in buyer-supplier relationships. *J. Oper. Manag.* **2011**, *29*, 277–288. [CrossRef]
47. Kim, S.Y.; Nguyen, V.T. A structural model for the impact of supply chain relationship traits on project performance in construction. *Prod. Plan. Control.* **2018**, *29*, 170–183. [CrossRef]
48. Zhang, M.; Lettice, F.; Chan, H.K.; Nguyen, H.T. Supplier integration and firm performance: The moderating effects of internal integration and trust. *Prod. Plan. Control.* **2018**, *29*, 802–813. [CrossRef]
49. Woo, C.; Kim, M.G.; Chung, Y.; Rho, J.J. Suppliers' communication capability and 32 external green integration for green and financial performance in Korean construction industry. *J. Clean. Prod.* **2016**, *112*, 483–493. [CrossRef]
50. Lu, L.Y.; Wu, C.H.; Kuo, T. Environmental principles applicable to green supplier evaluation by using multi-objective decision analysis. *Int. J. Prod. Res.* **2007**, *45*, 4317–4331. [CrossRef]
51. Chen, P.; Hung, S. Collaborative green innovation in emerging countries: A social capital perspective. *Int. J. Oper. Prod. Manag.* **2014**, *34*, 347–363. [CrossRef]
52. Fairchild, R.J. The manufacturing sector's environmental motives: A game-theoretic analysis. *J. Bus. Ethics* **2008**, *79*, 333–344. [CrossRef]
53. Martín-de Castro, G.; Amores-Salvadó, J.; Navas-López, J.E.; Balarezo-Núñez, R.M. Corporate environmental reputation: Exploring its definitional landscape. *Bus. Ethics* **2020**, *29*, 130–142. [CrossRef]
54. Behrend, T.S.; Baker, B.A.; Thompson, L.F. Effects of pro-environmental recruiting messages: The role of organizational reputation. *J. Bus. Psychol.* **2009**, *24*, 341–350. [CrossRef]
55. Minkiewicz, J.; Evans, J.; Bridson, K.; Mavondo, F. Corporate image in the leisure services sector. *J. Serv. Mark.* **2011**, *25*, 190–201. [CrossRef]
56. Raka Sukawati, T.G.; Astawa, I.P.; Silaen, P. Green reputation of hotel improvement through green accounting and harmonious culture. *Qual.-Access Success* **2020**, *21*, 112–117.
57. Dilling, P.F.A. Sustainability reporting in a global context: What are the characteristic of corporation that provide high quality sustainability reports—An empirical analysis. *Int. Bus. Econ. Res. J.* **2010**, *9*, 19–30. [CrossRef]
58. Çaliskan, A.O. How accounting and accountants may contribute in sustainability? *Soc. Responsib. J.* **2014**, *10*, 246–267. [CrossRef]
59. Herzig, C.; Schaltegger, S. Corporate sustainability reporting: An overview. In *Sustainability Accounting and Reporting*; Bennett, M., Buritt, R.L., Eds.; Kluwer Academic Publishers: Boston, MA, USA; Dordrecht, The Netherlands; London, UK, 2011; pp. 301–324.
60. Bathmanathan, V.; Hironaka, C. Sustainability and business: What is green corporate image? In Proceedings of the IOP Conference Series Earth and Environmental Scienc, Putrajaya, Malaysia, Florence, Italy, 23–25 February 2016; Volume 32, p. 012049. [CrossRef]
61. Nair, S.R.; Menon, C.G. An environment marketing system—A proposed model based on Indian experience. *Bus. Strat. Environ.* **2008**, *17*, 467–479. [CrossRef]
62. Kurzak, A. Green marketing. In *Changing World, Demographic, Social and Economic Perspective*; Osiński, J.M., Pachocka, M., Eds.; SGH: Warszawa, Poland, 2013; pp. 223–234.
63. Vilkaite-Vaitone, N.; Ilona Skackauskiene, I.; Díaz-Meneses, G. Measuring green marketing: Scale development and validation. *Energies* **2022**, *15*, 718. [CrossRef]
64. Bati, U. Green marketing activities to support corporate reputation on a sample from turkey. *Int. J. Mark. Stud.* **2016**, *8*, 189–201. [CrossRef]
65. Asiaei, K.; Jusoh, R. A multidimensional view of intellectual capital: The impact on organizational performance. *Manag. Decis.* **2015**, *53*, 668–697. [CrossRef]
66. Sidik, M.H.J.; Yadiati, W.; Hoyoung Lee, H.; Nadeem Khalid, N. The dynamic association of energy, environmental management accounting and green intellectual capital with corporate environmental performance and competitive advantages. *Int. J. Energy Econ. Policy* **2019**, *9*, 379–386. [CrossRef]
67. Lin, Y.-H.; Chen, Y.-S. Determinants of green competitive advantage: The roles of green knowledge sharing, green dynamic capabilities, and green service innovation. *Qual. Quant.* **2016**, *51*, 1663–1685. [CrossRef]
68. Papadasa, K.-K.; Avlonitisb, G.J.; Carriganc, M.; Pihad, L. The interplay of strategic and internal green marketing orientation on competitive advantage. *J. Bus. Res.* **2019**, *104*, 632–643. [CrossRef]
69. Erinos, N.R.; Yurniwati, Y. Green intellectual capital and financial performance of manufacturing companies in Indonesia. *Adv. Econ. Bus. Manag. Res.* **2018**, *57*, 57–62.
70. Edvinsson, L.; Malone, M. *Intellectual Capital*; Harper Business: New York, NY, USA, 1997.
71. Hair, J.; Anderson, R.; Black, B.; Babin, B. *Multivariate Data Analysis*; Pearson: Upper Saddle River, NJ, USA, 2016.

72. Kottawatta, H. *Research Guide Book*; Department of Human Resource Management: Colombo, Sri Lanka, 2014.
73. Zhu, Q.; Sarkis, J.; Lai, K.H. Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. *J. Purch. Supply Manag.* **2012**, *19*, 106–117. [CrossRef]
74. Paulraj, A. Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. *J. Supply Chain. Manag.* **2011**, *47*, 19–37. [CrossRef]
75. Laosirihongthong, T.; Adebanjo, D.; Tan, K.C. Green supply chain management practices and performance. *Ind. Manag. Data Syst.* **2013**, *113*, 1088–1109. [CrossRef]
76. Forman, M.; Joergensen, M.S. The social shaping of the participation of employees in environmental work within enterprises—Experiences form the Danish context. *Technol. Anal. Strateg. Manag.* **2001**, *13*, 71–90. [CrossRef]
77. Bhutto, S.A.; Auranzeb, Z. Effects of green human resources management on firm performance: An empirical study on Pakistani firms. *Eur. J. Bus. Manag.* **2016**, *8*, 119–125.
78. Dangelico, R.M. Improving firm environmental performance and reputation: The role of employee green teams. *Bus. Strategy Environ.* **2015**, *24*, 735–749. [CrossRef]
79. Gross-Gołacka, E.; Kusterka-Jefmańska, M.; Jefmański, B. Can elements of intellectual capital improve business sustainability?—The perspective of managers of SMEs in Poland. *Sustainability* **2020**, *12*, 1545. [CrossRef]
80. Rayner, J.; Morgan, D. An empirical study of 'green'workplace behaviours: Ability, motivation and opportunity. *Asia Pac. J. Hum. Resour.* **2018**, *56*, 56–78. [CrossRef]
81. Jones, E.; Harrison, D.W.; McLaren, J. Managing creative Eco-innovation—Structuring outputs from Eco-innovation projects. *J. Sustain. Prod. Des.* **2001**, *1*, 27–39. [CrossRef]
82. Youndt, M.A.; Snell, S.A. Human resource configurations, intellectual capital, and organizational performance. *J. Manag. Issues* **2004**, *16*, 337–360.
83. Yusoff, Y.M.; Omar, M.K.; Kamarudin, M.D. Do all elements of green intellectual capital contribute toward business sustainability? Evidence from the Malaysian context using the Partial Least Squares method. *J. Clean. Prod.* **2019**, *234*, 626–637. [CrossRef]
84. Owino, W.A.; Kwasira, J. Influence of selected green human resource management practices on environmental sustainability at menengai oil refinery limited Nakuru, Kenya. *J. Hum. Resour. Manag.* **2016**, *4*, 19–27. [CrossRef]
85. Guerci, M.; Longoni, A.; Luzzini, D. Translating stakeholder pressures into environmental performance: The mediating role of green HRM practices. *Int. J. Hum. Resour. Manag.* **2016**, *27*, 262–289. [CrossRef]