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Enhancing Business Sustainability through Green Intellectual Capital and Green Creativity: Moderating Role of Green Innovation

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Abstract

Purpose: This study aims to examine the composite relationship between green innovation and green creativity in green intellectual capital and business sustainability among manufacturing SMEs in Pakistan.
Design/ methodology/ approach: To test five hypotheses of this study, the data were collected by conducting a survey from 338 manufacturing SMEs in Pakistan, this study applied a statistical method that was contingent on the SEM model.Findings: The results reported a significant relationship of green creativity and green intellectual capital on business sustainability while the moderation of green innovation was found to be insignificant. It also revealed that green creativity mediates between green intellectual capital and business sustainability. Therefore, it has been argued that SMEs in Pakistan participate fairly in promoting green creativity, which helps sustain their businesses.Research Limitation: The key limitation is sample size from only SMEs, future research can address this issue and conduct research by using different sectors. Practical Implication: The results of this study will help the managers to devise policies based on green intellectual capital to enhance sustainability with the mediating role of creativity and promote them at all organizational levels. Originality/Value: This study contributes to the existing literature by investigating the mediating role of green creativity between green intellectual capital and sustainability more comprehensively. And provide practical implications for the managers of SMEs.

Introduction

It has been a score of abrupt economic and financial development which has happened at the expense of global warming, all types of pollution, and deforestation, which are today's most significant global environmental issues, and have raised debate and concern regarding Environmental Sustainability (Jin et al., 2020).

In this tussle of either being green or non-green, SMEs have acknowledged the demand to reflect properly on the supposed trade-off between economic performance and a sustainable green view. Although sustainability of the environment is assumed an SME goal, the association between ecological protection and SME strategy has conventionally been highlighted as a swap between economic benefits and green performance. Research in this area is now underway, as it has been less studied and explored (Wang & Juo, 2021). Most recent studies acknowledge the tangible benefits of green practices by researching corporate performance and environmental problems, suggesting the relationship is complex. In addition to tangible resources, intangible resources, such as intellectual capital, are critical assets. In this study, both resources are discovered, as Green Intellectual Capital encourages SMEs to increase their economic and environmental performance and identify the path of impact for various components of Green Intellectual Capital on an SME's business sustainability by considering green creativity and innovation.

Green Intellectual Capital blends staff's intellectual stuff, intellectual property, information, awareness, experience, and knowledge which can be utilized for value creation in the long run. The initial stage suggests that HR management reports that all the dimensions of green intellectual capital help create value for an SME and contribute to its financial sustainability. (Minoja & Romano, 2021). A robust relationship between Green Intellectual Capital and Business Sustainability was proposed by Ullah et al. (2021), who discovered a strong association between them in emerging SMEs. This study claims that considering all the dimensions of GIC strongly impacts the BS of any organization. GIC can be ingrained efficiently in an SME's actions. Still, it also promotes creative, rare, and innovative products and services, fabrication methods, and the aligned SME's robustness (Zhou et al., 2020). This serves as a foundation for an SME's human capital and other means to incorporate knowledge and ideas into the organization. Therefore, GIC provides a solid foundation for ingraining green innovation and creativity in SMEs.

On Global Innovation Index 2022, Pakistan is ranked 87th among 128 countries with the index value of 23 out of 100 which illustrates that innovation and creativity must be promoted in Pakistan in all sectors and at all levels (The Global Economy). The evidence of this study in Pakistani Small and Medium Enterprises is restricted, but Al (2018) previously claimed that shortly, green innovation could be investigated in SMEs as their study was also limited and left a gap for future studies. Researchers have expanded their studies to other sectors and countries like China, where the nature of the study was also limited, but have suggested the moderation of eco-innovation between Green Intellectual Capital and Business Sustainability (Gazi et al., 2024). To reduce this gap in the literature, our study investigates GIC to develop an understanding of the procedure by which an SEM's green innovation and green creativity affect its economic performance. Both highlight the linkage between GIC and BS. Green Innovation designates innovations that highlight the seriousness of environmental issues using improved management practices, systems, and technologies. Once SMEs have identified their GICs, they can implement this GI through GC to enhance them. As a result, we can sustain and increase an SME's financial performance by providing critical feedback on GI and GC to manage its GICs more efficiently. This indicates that the GIC will have an impact on the BS by carefully implementing the GC.

An SME's financial performance is based on different elements such as intangible assets, intellectual capital, and human capital structure. SMEs must maintain their businesses while coping with rapid development and increased competition; otherwise, they will soon be wiped out of the market. Hence, to clinch the prolonged existence of an SME, business sustainability is fairly important when implementing green policies (Wang & Juo, 2021). Considering the moderating role of Green Innovation, researchers have contrasting ideas between GIC and an SME's financial

performance. Thus, it is mandatory to hold the impression of GIC on the sustainability of business. Technological advancements have also encouraged SMEs to incorporate new creative and innovative technological advancements into their business procedures (Raguseo, 2018). In this way, we can examine the effect of green innovation and green creativity in the association of GIC and BS in manufacturing SMEs in Pakistan. Yet, some studies have discussed various mechanisms by which GIC provokes GI and GC. Our study will contribute to the GIC debate, primarily by decomposing the GIC that leaves an impact on the economic as well as green performance in SMEs, and later, by investigating the mediating effect of GC and the moderating effect of GI to strengthen the GIC- BS linkage. Furthermore, at the SME level, it will guide Pakistani SMEs of manufacturing nature to improve their business sustainability by effectively managing GIC and incorporating Green Creativity in all policies, processes, and procedures.

In this contemporary business world, SMEs are inclined towards green creativity and green innovation as well as the sustainability of their businesses. It creates an environment of severe competition which ultimately demands more novel products and services from the SMEs which improves procedures and processes to achieve maximum efficiency (Ullah et al., 2021). To cope with the fierce competition and create distinction in this industry, it is suggested that the targeted goal can only be achieved by taking the first step of green innovation which is green creativity. In today's world, the most productive and extensive assets for any SME are the intangible ones like human capital, customer relationships, and brand value (Waseem et al., 2018). Nowadays, these are crucial for companies and huge efforts are asserted to realize enhanced GIC, which in return improves effectiveness and performance. In this way, all the dimensions of GIC are significant for the sustainability of the businesses and they must be monitored carefully to ensure growth and success (Li et al., 2021).

Theoretical Framework and Hypothesis Development

SMEs are raising awareness regarding the introduction of environment-friendly actions and operations and the generation of sustainable capabilities and intangible assets including GIC and GI. Natural Resource Based View provides a solid foundation to study this link. This view is initiated by Hart (1995) and is driven by the classical Resource-Based View which states that in coming years, the policy, processes, competitive advantage, and strategy of any organization will be backed by its capabilities that smooth the economic activities based on sustainability. According to RBV, an SME can achieve and maintain superior performance when its intangible assets and resources are integrated or combined. GIC is a versatile model and has been researched, evaluated, and examined in diverse theories.

Previous studies have defined Intellectual Capital as the summation of stocks and circulation of valuable experiences, knowledge, and skills in an SME (Ullah et al., 2022). Intangible resources generate a competitive advantage which is sustainable as they are complex and rare such as green structural capital and green human capital, so they are less likely to be imitable (Khan et al., 2021). Planning is the key source in gaining a competitive advantage in SMEs that avoid internal weaknesses and external threats while utilizing their internal strengths and external opportunities. RBV highlights the ultimate significance of internal resources for obtaining a sustainable competitive advantage. Likewise, an SME's financial performance is a feature to determine the efficiency of financial managers who strive to compose their SMEs with those available assets featured to be rare, unpredictable, and important. (Iqbal et al., 2020).

GIC is the accumulation of collective information, knowledge, intellectual property rights, technologies, team communication systems, experiences, organizational learning and competencies, brands, and customer relations that generate value for SMEs (Akhtar et al., 2024).

GIC has three main dimensions including Green Human Capital, Green Structural Capital, and Green Relational Capital. GHC is not embedded in SMEs but in the employees and it can be heavily affected by the leaving of employees. So it is explained as the total of the workforce's skills, knowledge, their capabilities, attitudes, experiences, creativities, commitments, etc. about green innovation and protecting the environment (Chen, 2008).

GSC unlike GHC is embedded into the SMEs and remains ineffective by the leaving of employees. With the invention of Worldwide environmentalism, the knowledge regarding environment and culture adopted in SMEs plays a vital part in generating and device environmental strategies to obtain competitive advantages or to seek the latest opportunities (Chang & Chen, 2012). Hence, it is described as the total stock of organizational commitments, capabilities, systems of knowledge management, organizational culture, organizational philosophies, SME trademarks, copyrights, patents, images, logos, etc. about green innovation or environmental protection within an SME.

Relationship Capital is the total number of associations between the SME and its stakeholders like network members, suppliers, partners, and customers (Johnson, 1999). The SMEs need resources and assistance from their external institutions and core stakeholders to grow and survive. Nowadays, the stakeholders and the external institutions pay more heed to environmental issues so it is better for the companies to maintain strong relationships with them for the development of mutual environmental interests. Thus, GRC is the summation of an SME's linkage with its suppliers, partners, network members, and customers about green innovation and environmental management and protection (Chen, 2008).

Green Intellectual Capital and Business Sustainability:

The SMEs cannot deny the importance of environmental issues and their protection under the supreme pressure of environmental regulations which are imposed internationally (Gazi et al., 2024). Similarly, the SME's GIC management must check the externalities caused by them, which reduces waste and increases productivity simultaneously as well as increases the performance of the SMEs. GHC is a set of intangible capabilities and assets that shows a rigid base for gaining a sustainable competitive advantage as it is tough for rivals to emulate it (Mansoor et al., 2021). A certified GHC works to improve the probability of gaining sustainable competitive advantage, since the workforce having more environmental awareness will have more skills and experiences to mark environmental issues besides its challenges and thus, helps in the creation of sustained performance with time (Pellegrini et al., 2018).

The association between the SMEs can drastically enhance their capability to handle environmental issues and challenges. An intense and strong relationship between them can prove to be a constructive source to associate in decreasing the fatalistic externalities created by their actions and activities. Due to the increase in interaction, the companies exchange their capabilities and resources and work on creating strong relationships to generate positive externalities that help in achieving advantages (Kohtamäki et al., 2012). GSC is purely a core asset that is helpful in the completion of environmental goals by presenting a stack of intangible resources acquired by the SME which directs it to improve performance. GIC helps sustain the Business performance in three different ways. Primarily, it allows cost-effectiveness. (Marco-Lajara et al., 2022) Secondly, it raises the awareness of green knowledge among the workforce. Thirdly, it allows SMEs commitment to the challenging expectations and standards prevailing in legal environmental regulations. According to Chuang and Huang (2018), the sustainability of the business is grounded in the SME's capability to gather resources and knowledge allied with the protection of the environment. Therefore, on the base of the above arguments, the following hypothesis is proposed.

H1: GIC has a positive effect on BS

Green Intellectual Capital and Green Creativity:

The versatile paradigm of GIC is the amalgamation of GHC, GSC, and GRC. Creativity is a process of indulging in creative actions and procedures irrespective of the results which are novel, creative, or useful (Drazin et al., 1999). Green creativity is the process of creating eco-friendly ideas either in product creation or procedures. GHC is proven to be the key resource for inducing green creativity in SMEs through their dynamic ideas and knowledge (Subramaniam & Youndt, 2005). In this way, the creative activities taken by the employees enhance their capabilities for creating and developing something that is equally novel and meaningful within their organization.

Likewise, GSC is yet another source of introducing creativity within an organization by introducing formal tools, approaches, and resources to enhance meaningful novel attitudes and behaviors (Bharadwaj & Menon, 2000). SMEs with efficient GRC can develop and promote new rare, innovative, and creative environmental ideas, opportunities, and technologies within a connected network (Dickel et al., 2018). Through GRC, SMEs can hold closer and longer relationships with their stakeholders and external institutions under this green trend by investing in those resources that are of their common creativity interests. Considering all these scenarios, the second hypothesis is proposed.

H2: GIC has a positive impact on GC.

Green Creativity and Business Sustainability:

Creativity encourages an SME to develop and widen the range of its new products and its knowledge base as it is a task of creating new notions or solutions that are original and provide solutions to problems. The proposal of new ideas, processes, products, services, and strategies in a composite social system is the fruit of Organizational Creativity (Woodman et al., 1993). In the recognition of Creativity by UNESCO in 2013, it was urged that to address the sustainability issue, SMEs must make efforts to develop and promote creativity (Awan et al., 2019). Therefore, we can assume that creativity is the navigator behind the sustainable performance of an organization. Taking into view the concept of green creativity, the creative approaches, processes, and procedures must be environmentally friendly.

The new green creative ideas, products, and procedures initially reduce the production cost of an organization which is better for its performance. Furthermore, it is also time-saving as it reduces the production time of the product or service which increases the efficiency of the organization and contributes to sustaining its performance. Additionally, the eco-friendly processes and procedures provide less or no harm to the environment, and as it is our Corporate Social Responsibility as well and it also helps in creating an ecofriendly reputation. A similar relationship was recently discussed by AlQershi et al. (2023) and on this basis, we have proposed the following hypothesis.

H3: GC has a positive impact on BS

The Mediating Role of Green Creativity:

Creativity is a significant forerunner of innovation which is a crucial step in the process of innovation that enables the internal policy makers and external marketers to highlight customer needs and demands along with competitive actions (Shahbaz et al., 2024). It is the formation of useful, innovative, and unique ideas leading to green policies, products, processes, practices, and services that are rare and unique (Chen & Chang, 2013). Here, GC mediates the relationship between GIC and BS by implementing novel methods, ideas, policies, and activities that are linked to the financial sustainability of the companies. It is a pivotal supporter of sustainable development

and assists SMEs in developing a unique green image (Zameer et al., 2020). Previously, Mittal and Dhar (2016) explained this relationship by developing a link between GC and sustainable performance.

Furthermore, Song and Yu (2018) suggested that SMEs can develop new notions or ideas from environmental and corporate challenges which ultimately leads to GC. Similarly, Ferreira et al. (2020) claimed that green creativity can strengthen the competitive advantage of SMEs by focusing on strategic innovation rather than product innovation. Hence, it is important to infuse creativity in the decision-making processes of the organization that will create a positive brand image as well as sustain the competitive advantage for SMEs. In this way, GC mediates the relationship between GIC and BS and on this base, the following hypothesis is proposed.

H4: GC mediated the relationship between GIC and BS.

The Moderating Role of Green Innovation:

The business performance of any SME is influenced by its GHC is an old notion but to identify the concise role of GIC in an SME's performance, the character of GI must be understood. GI encourages the SMEs to devise new and creative policies to ensure efficiencies in the environmental strategy (Akhtar et al., 2024). The more versatile the GHC is, the more successful the SME is and it will gain an edge over its rival by having a sustainable competitive advantage on them (Wang & Juo, 2021). Business Sustainability can also be ensured by utilizing the organizational culture and capabilities and integrating environmental concerns. GI can be easily introduced by GSC as it has a strong impact on performance (Wang & Juo, 2021). It is because GI requires upgrading in material units or elements utilized and it also generates a positive environmental externality.

The introduction of GI by implementing the GSC strategy will lower pollution and its harmful effects on the environment which ultimately helps in gaining an advantage (Gürlek & Tuna, 2018). GRC encourages collaboration with external parties as it drives GI which supports creativity and promotes new ideas and knowledge. Thus, by GI SMEs vigilantly create strategies and induce a mutual impact for increasing the economic performance (Tang et al., 2018). GI needs external green intelligence and knowledge rather than simple innovation. Now, if an SME pursues external resources of green knowledge and captivates it in GI tasks about external parties to anchor economic performance, this will help in the SME's business sustainability (Marra et al., 2020). The following hypothesis is proposed based on the above arguments:

H5: GI moderates the relationship between GIC and BS.

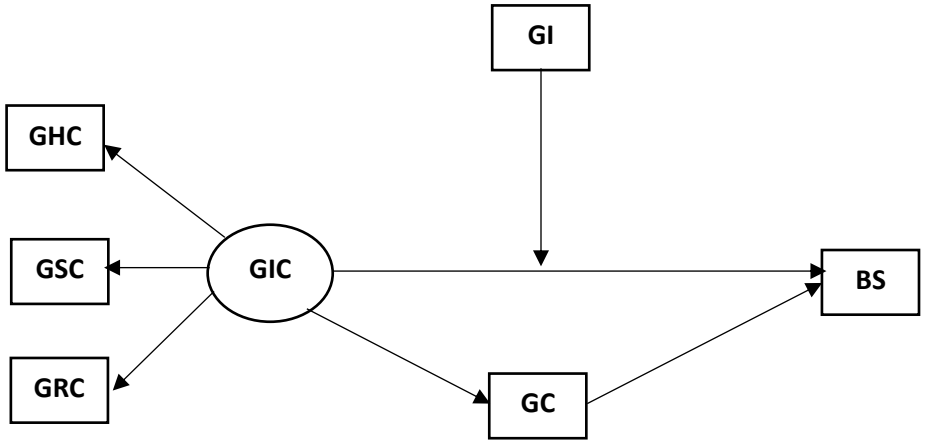

Figure 1 Conceptual Model

Methodology

Population and Sampling:

One of the most flourishing industrial sectors of Pakistan is Manufacturing, due to its low-cost labor and contributes towards the growth of the economy but on the other side, it is a major cause of pollution creation as well. In this economic revolution era, manufacturing companies must incorporate GC and GI in their actions, processes, and procedures to reduce pollution along with waste. The research design is a Questionnaire through which we examined GHC, GSC, GRC, BS, GI, and GC. Furthermore, we have opted for optimism as our ideology so the nature of the study is based on objectivism. The SEM model was also selected by Cantù (2010) in his study conducted in the SMEs of Jordan where he determined the association of IC and IP. Another study conducted by (Lascaux, 2020) opted for the same SEM model to verify the effect of IC on SMEs in Pakistan. The quantitative approach is used to gain the core purposes of the study. Now, the sole rationale behind choosing this quantitative design is correlated with the core of the study, because it demands exploration on a comparatively bigger sample.

Therefore, to check the relationship between the opted variables, the study also requires additional factual proof, data, or numerical facts. Hence, the selection of this quantitative approach was a better option for this study. Furthermore, the primary sources are used for this study to cumulate quantitative data. This study will create a valuable and worthy contribution to the body of literature. The data was collected by using a primary data collection process as it directs us to gather basic data. For this purpose, the data is gathered through a survey form which was circulated in the SMEs of Pakistan. It compelled the researchers to collect and process more authentic and appropriate data on the research subject.

Hence, we randomly selected 600 SMEs in Pakistan of a manufacturing nature and forwarded our questionnaire to Human Resource Managers. Out of which 349 forms got impressions and received back and eleven of them were incomplete and were discarded. Resultantly, only 338 questionnaire forms were evaluated. Past studies have argued that more than 200 readings are sufficient for administering co-variance-based SEM (Sultan et al., 2021). The data was fetched between March 2023 and July 2023 through a convenient sampling technique. The rationale behind it was to acquire quick sufficient responses within a short period and also there are few complications associated with this technique. The questionnaire forms include various close-ended questions related to all the variables of the study. The questionnaire was designed while considering a total of 30 items on a 5-point Likert scale, starting from 1 as ‘strongly disagree’ to 5 as ‘strongly agree’.

Table 1 Constructs used in the research questionnaire

Construct	No. of items	Adapted from
GHC	5	Ullah et al. (2022), Chang and Chen (2012)
GSC	5	Ullah et al. (2022), Chang and Chen (2012)
GRC	5	Chang and Chen (2012), Chen (2008)
BS	4	Ullah et al. (2022), Hsieh and Tsai (2007)
GC	6	Song and Yu (2018), Barczak et al. (2010)
GI	5	Ullah et al. (2022), Du and Li (2019)

Data Analysis and Results:

The socio-demographic traits of the participants are described in Table 2, where the aggregate of the males was 178 (52.7%) and the aggregate of females was 160 (47.3%). According

to age factor, 91 (26.9%) participants belonged to the 21-30 age group, 101 (29.9%) participants in the 31-40 age group, 97 (28.7%) participants belonged to the age group of 41-50 and lastly, 49 (14.5%) participants were above the age of 50. The Education profile entailed that 43 (12.7%) participants did graduation, 145 (42.9%) did post-graduation, and 110 (32.5%) did MPhil while 40 (11.8%) did PhD. According to work experience, 43 (17.4%) of them had experience of up to 2 years, 152 (46.6%) had up to 5 years, 101 (29.3%) had up to 8 years and the rest of them had above 8 years of experience (6.7%).

Table 2 Demographics on investigated statistics

Items	Characteristics	Frequency	Percentage
Gender	Male	178	52.7
	Female	160	47.3
Age	21-30	91	26.9
	31-40	101	29.9
	41-50	97	28.7
	50+	49	14.5
Education	Graduation	43	12.7
	Post-Graduation	145	42.9
	MPhil	110	32.5
	PhD	40	11.8
Experience	<2 years	43	17.4
	2-5 years	152	46.6
	5-8 years	101	29.3
	>8 years	42	6.7

Measurement Model:

For the analysis of the collected data, we considered the SEM method on IBM AMOS v24 and other statistics on IBM SPSS 26. According to previous studies, the SEM method is the most efficient and convenient process to evaluate the most difficult models having versatile determinants (Akhtar et al., 2024). For measuring the structural relationship between different variables, the SEM is repeatedly used while calculating regression and confirmatory regression analysis (CFA). Similarly, composite reliability and Cronbach's alpha are also considered to measure the reliability of the model by evaluating internal consistency. For examination purposes, initially, the normality of the data is ensured as the mean value is in range and the skewness is also between -1 and +1.

Table 3 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
GI	338	1.00	5.00	3.4941	1.13227	-.743	.133
GHC	338	1.00	5.00	3.4420	1.17046	-.599	.133
GSC	338	1.00	5.00	3.5254	1.11579	-.724	.133
GRC	338	1.00	5.00	3.5426	1.09138	-.822	.133
BS	338	1.00	5.75	3.4297	1.08949	-.238	.133
GC	338	1.00	5.00	3.4398	1.12556	-.543	.133

Valid N (listwise)	338

Secondly, the reliability is checked by applying Cronbach's alpha to every individual variable. According to different studies, the threshold value of the reliability or the range of Cronbach's alpha is in the range of 0.6 and 0.7 (Abbasi et al., 2021; Wang & Yang, 2021). In our study, all the variables are acknowledged as reliable, as each value of Cronbach's alpha is above 0.6. The GHC, GSC, GRC, BS, GC, and GI have Cronbach's alpha values of 0.954, 0.948, 0.934, 0.915, 0.964, and 0.939 respectively. Factor loading is expected to be higher than 0.5 whereas in various studies it is also above 0.7. In our case, all the values are above 0.7 which verifies the convergent validity.

Table 4 Summary of Measurement Model

Variables	Items	Factor Loading	AVE	Cronbach's Alpha
GHC	GHC1	0.879	0.806	0.954
	GHC2	0.905		
	GHC3	0.887		
	GHC4	0.906		
	GHC5	0.912		
GSC	GSC1	0.912	0.786	0.948
	GSC2	0.906		
	GSC3	0.885		
	GSC4	0.880		
	GSC5	0.847		
GRC	GRC1	0.832	0.738	0.934
	GRC2	0.871		
	GRC3	0.878		
	GRC4	0.874		
	GRC5	0.838		
BS	BS1	0.820	0.729	0.915
	BS2	0.857		
	BS3	0.876		
	BS4	0.861		
GC	GC1	0.840	0.819	0.964
	GC2	0.861		
	GC3	0.903		
	GC4	0.960		
	GC5	0.960		
	GC6	0.900		
GI	GI1	0.791	0.755	0.939
	GI2	0.887		
	GI3	0.893		
	GI4	0.887		
	GI5	0.882		

Furthermore, discriminant validity is also ensured as the relationship of a single variable with itself is stronger than the others. GHC has the strongest relationship with itself i.e. 0.898 while

the rest of all are below it. On a similar pattern, all the other variables follow this trend and confirm the discriminant validity of the constructs.

Table 5 Discriminant Validity

	GHC	GSC	GRC	GC	BS	GI
GHC	**0.898**					
GSC	0.616	**0.886**				
GRC	0.596	0.466	**0.859**			
GC	0.328	0.386	0.401	**0.905**		
BS	0.311	0.361	0.418	0.711	**0.854**	
GI	0.601	0.514	0.563	0.486	0.559	**0.869**

Structural Model:

The analysis shows that the GIC has a strong positive impact on the BS of the SMEs in Pakistan (β=0.172, p value=0.001) including all dimensions of GIC which suggests that all the intangible resources and capabilities of an organization contribute heavily to its business sustainability in most SMEs of Pakistan. GIC also has a strong and positive relationship with the GC as the p value is 0.000 and β value is 0.472 which briefs us on the importance of all the dimensions of GIC as they help introduce GC in the SMEs of Pakistan. Similarly, GC also impacts BS significantly and positively as the p value is 0.00 and β value is 0.592 which highlights that with the deployment of GC in the SMEs, we can achieve sustainability in our businesses.

However, the moderator which is GI has an insignificant relation with BS as the value of β is 0.016 and the p value is more than 0.05 which suggests that GI must be deployed separately to check the relationship with BS as the moderation effect is nil in the model. Lastly, the mediation effect of GC has a strong influence on GIC-BS linkage as the value of β is 0.226 and the p-value is 0.01, it suggests the encouragement and enforcement of green creativity in SMEs.

Discussion

The findings from the studies now illustrate that every dimension of green intellectual capital acts significantly. GI was introduced as a moderator in the GIC-BS linkage. GC was analyzed individually as well as the mediator in the association between GIC and BS. The experiences and skills of the employees were analyzed regarding green intellectual capital which includes vital sets of skills, relevant experience, and creative ability. According to our study, GIC has a strong effect on BS, and a similar relationship was also confirmed by Ullah et al. (2022) including all the dimensions of GIC. In the same way, the outcomes of this study are also consistent with the findings of Wang and Juo (2021) based on GIC.

An employee's creativity is yet another crucial part of green innovation which highly contributes to the green innovation process of an SME. The measurement scale was thus upgraded by the advancement of knowledge and novel concepts. The details on technological capital are in connection with the knowledge level for utility, technology, R&D expenses, and the use of patents. The next relationship between GIC and GC is less explored in the previous studies and was also highlighted by Al (2018). In this way, an independent significant relationship of GC is explored with GIC. The results of the mediation of GC are also harmonious with past studies and supported our hypothesis (Wang & Juo, 2021).

Contrary to our expectations, the GIC-BS linkage intensifies that although the idea creation, innovation, and experience can be assumed as the obstacles on the pathway of radical

innovations. Our study proved this relationship as insignificant and it also contradicts the study of Huang and Li (2017) where this relationship was significant Now this association is also in contrast with the previous studies like Ullah and Wang (2022) and Yusoff et al. (2019). Lastly, studies investigating the link between GC and BS are rare but in our case, they have a strong significant relationship.

Table 6 Hypothesis testing and decision

	Estimate	S.E.	P value	Decision
BS ← GIC	.172	.062	.00	Significant
GC←GIC	.472	.074	.00	Significant
BS ← GC	.592	.045	.00	Significant
BS ← GI(Mod)	.016	.041	.685	Insignificant
BS ←GC*GIC	.226	.037	.01	Significant

Theoretical contribution:

Different theories regarding the GIC, BS, GC, and GI are identified which explains the social and trading interactions. The initial findings of our study confirmed and elaborated the social exchange theory by indicating the significant and positive association between all dimensions of GIC and business sustainability which compels SMEs to develop a strong link with green employees, network partners, suppliers, and customers. It will help in achieving the goal of business sustainability. To resolve the business and environmental issues, the scholar suggested an important demand to incorporate a green technique like GI, GIC, and GC. Previous studies have highlighted the improvements in the enforcement of GIC but the correlation between GIC and BS while considering GI and GC has not yet been explored especially in Pakistan.

Our study fulfills this hole by investigating the influence of all dimensions of GIC namely GHC, GSC, and GRC on BS in the presence of GC and GI. Firstly, the study suggests that GIC inclusive of all the dimensions has a robust significant relationship and it is inconsistent with the earlier studies (Rehman et al., 2021). But still, some argue that GIC has a vital contribution regarding business sustainability (Shahzad et al., 2021). Secondly, this study highlighted a significant correlation between GIC and GC which directs towards the implication of creativity in SMEs. Thirdly, GC has a strong impact on BS which defines the robust association between the two as sustainability can be achieved by ingraining GC in the SMEs. Fourthly, GC mediates the effect of GIC on BS as it provides the grounds of green creativity to boast BS by considering GIC. Lastly, the various SMEs especially the manufacturing ones are inclined to ignore the advanced innovative concepts of GI on BS and our study also proves the same.

Implications:

Now, it has become a vital requirement for the SME's top management to develop GHC which can strive to achieve desired results regarding business sustainability. For this reason, companies should arrange green training activities or seminars in their workplace for their staff to improve and increase their knowledge and experience and encourage more GHC. Other than that, GSC and GRC have also a strong significant impact on BS which brings out more managerial implications. According to our study, the SMEs must promote relations with their suppliers and

customers to achieve sustainability goals as well as work on their patents and copyrights for promoting GSC.

Furthermore, environmental and business sustainability can also be achieved by encouraging society to work on GIC and GI. In the past, the enforcement of such reforms made it complex for SMEs and policymakers to obtain the confidence of the public as they were uncertain. It is now crucial to create appropriate policies to promote research which helps achieve and enhance public support for change. The investments and legislation will stimulate natives to invest in green innovative approaches for the sustainability of their businesses. The changes are made to gain the governmental support that carries out business sustainability. It should work in the favor of economically and socially advantaged people and make things easier or cheaper for them. It is a time-consuming procedure but once it has built and maintained the confidence in these issues within no time the intense actions will lead the businesses towards sustainability in Pakistan.

Moreover, GIC can prove to be an obstacle or an opportunity so it must be incorporated carefully. The SME's growth and business sustainability are now based on yet another factor named green creativity identified through this study. The manufacturing SMEs conducting business in Pakistan are encouraged to raise awareness at their workplaces to coordinate their aims with the SMEs to gain sustainability. Additionally, the government should play its role in initiating training programs that will educate the employees, and ultimately business sustainability will be increased.

The manufacturers of the SMESs should promote and enhance a direction to increase the performance of the business. Their owners can also play a part in promoting creative ideas, services, processes, and procedures by offering a working atmosphere that is technologically improved. Furthermore, green creativity is the first step in incorporating innovative ideas in SMEs that prove to be sustainable. Now, this framework can be applied to any sort of SME either of trading or manufacturing or service nature. It can also be employed in different sectors as well as countries under varying scenarios. It also points towards additional and improved strategic resources which contribute significantly to the sustainable performance of SMEs.

Conclusion

This study has explained the robust relation between GIC and BS as well as the mediation of GC and the moderation of GI. A quantitative research design was opted, from which the primary data was collected via a survey form which was later evaluated through an SEM model which was based on the CFA analysis to confirm the model's reliability and validity and later, for the verification of the model, we conducted the path evaluation. Each of the latent constructs was proved to be definitive like Cronbach's alpha, the value of which was higher than 0.7 and ensured reliability. In the case of AVE, all the values were in range which ensured the validity of the data. The substantial literature has allowed us to identify all the dimensions of green intellectual capital that mark an impression on business sustainability. In this study, the core elements of GIC were green human capital, green structural capital, and green relational capital. These elements were previously discussed in the theoretical framework where their impact was examined on business sustainability.

According to the findings of our study, all GIC dimensions and green creativity leave a strong significant impact on sustainability as the value of p was less than 0.05 in both cases. For

this reason, SMEs are required to invest in their GIC as well as green creativity by developing an atmosphere of promoting creativity in their policies, processes, and procedures. They must also focus on skill improvement, conducting training sessions, arranging seminars, and chances for career advancement.

Limitations and Future Indications

The first and foremost limitation of our study is that its unique sample comprising of manufacturing SMEs in Pakistan. A succeeding study could also include other sectors related to green performance and growth like the chemical industry, farming, and construction, to reassure our study's findings. Secondly, our study checks the moderating role of GI in the GIC-BS linkage which proves to be insignificant. We can try another moderator to check moderation and also the solo role of GI could be analyzed. Further, the primary research method selected for this study is a quantitative approach and it could be fruitful for other researchers to conduct a mixed-method technique to extend the scope of methodologies in this particular field. Finally, this study is based on Pakistani SMEs of manufacturing nature where a peculiar cultural environment prevails, the future studies could be administered in different countries with diverse cultures to check more feasible variations.

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