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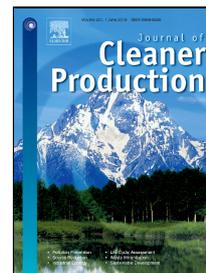
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**Creativity Enables Sustainable Development: Supplier Engagement as a Boundary
Condition for the Positive Effect on Green Innovation**

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Creativity Enables Sustainable Development: Supplier Engagement as a Boundary Condition for the Positive Effect on Green Innovation

1. Introduction

Creative thinking is a fast-growing trend among the global community that supports sustainable development initiatives, value chains, and the management of supply chain relationships. In a buyer-supplier relationship characterised by repeated interactions, the pressure to provide a timely response to customer demands can overtake other aspects of the relationship. Timely response, in turn, can lead firms to redefine the boundary conditions of creativity or a lack thereof. Creativity can be a critical aspect of addressing environmental sustainability and it comes with a generalizable framework (Stables, 2009). The increasing importance of creativity as an enabler of sustainable practices should not be overlooked, although it has its challenges (Mitchell and Walinga, 2017). Creativity in business seems to be the result of collaboration, exchanges and the interaction of ideas between individuals who work together collectively through dialogue and conflict (Amabile & Khaire, 2008). Earlier research studies have shown that social capital (SC) has an effect on organizational creativity (Sözbilir, 2018). SC is defined as “an instantiated informal norm that promotes co-operation between two or more individuals” (Fukuyama, 1995). Creativity is an important catalyst for innovation involving both products and services (Shrivastava et al., 2012). Mumford and Gustafson (1988) define creativity as the development of novel and potentially useful ideas about products, practices, services, or procedures. This study aims to review the relevant literature to uncover the challenges of enabling creativity, to understand capabilities as they relate to environmental management, and to posit relationships to environmental, operational, and social performance. Innovation is the antecedent of creativity and can lead to the development of new processes, products, services and technologies (Gundry et al., 2014). This shows how creativity enables firms to move toward sustainable development through an increased use of creative problem-solving approaches for green innovation.

There are numerous studies on the relationship between innovation and inter-firm relationships and on how availability and quality of internal resources, such as knowledge sharing and knowledge transfer, affect the adoption of green innovation (Arfi et al., 2018). Green innovation integrates environmental goals with product innovation and process innovation. Referring to the literature, green innovation is defined as, “involving the implementation of several management activities aimed at reducing environmental impact” (Triguero et al., 2013). Other studies contend that external knowledge can help a firm to improve innovation Triguero et al. (2013). However, the nature of the relationship between organizational creativity and sustainability is a topic that is often overlooked (Shrivastava, 2014). Creativity plays an important role in improving process and product designs through the application of novel ideas. Innovation combines existing knowledge

with new inputs from external knowledge and generates firm-specific knowledge resources that contribute to economic returns for a firm (Wang et al., 2016). Yet, a systematic understanding of how creative abilities contributes to innovation is still lacking.

So far, very little attention has been paid to the role of creative abilities within the boundaries of green innovation and sustainable development. Innovative companies such as Unilever, Red Bull, Coca-Cola Company and PepsiCo integrate cooperation and creative approaches into their business models by using collaborative efforts with direct competitors. These companies have collectively reduced the emission of around 43.5 million metric tons of CO₂ through the accelerated transition from fluorinated gas refrigerants (Refrigerants Naturally, 2017). The actions of companies like these provide anecdotal evidence that a creative approach to business is necessary for the development of green innovations. These examples also provide an opportunity to try and understand the important role of creativity when a company attempts to tie best practices with its competitors to develop new services or products.

Creativity allows firms to discover and capitalize on opportunities that enable them to be more innovative. The United Nation's (UN) 2030 Agenda for Sustainable Development "explicitly calls for businesses to apply their creativity to solve our current sustainable development challenges" (UNESCO, 2013). Add to this the UN's 17 Sustainable Development Goals (SDGs), and there is ample opportunity for practitioners to measure their actions against these goals and for researchers to look for relationships between creativity, the SDGs, and performance. Within the realm of business and management, creative insights have received little attention overall in the field of sustainability (Mitchell and Walinga, 2017; Shrivastava et al., 2012).

Previous research into the relationship between creativity and dynamic process capabilities have received limited attention in operations management literature (Shalley and Gilson, 2017). Further, Lozano (2014) argues that creativity and organizational learning can help to challenge traditional Newtonian and Cartesian mental models while fostering more sustainable societies. A number of studies have examined creativity as a driver for the innovation of new product development in intra-firm rather than inter-firm contexts (Amabile et al., 1996; Damanpour and Gopalakrishnan, 2001; Deshpandé et al., 1993; Eggers et al., 2017; Liu et al., 2017; Song and Yu, 2018; Wang et al., 2008). However, the mechanisms enabling a firm to explore and strive to innovate new products and can be channelled to foster improved environmental management initiatives, remain relatively unexplored. The question remains as to how creativity could be integrated within the organizational structure (Shrivastava, 2014).

Although there has been increased attention to creativity as a problem-solving approach and as a key driver for sustainability Mitchell and Walinga (2017), the literature has yet to demonstrate the empirical links between a comprehensive set of sustainable business practices and supplier

engagement, creativity, and sustainability performance. Saunders et al. (2015) define supplier engagement as a series of initiatives and actions to deal with challenging situations. The empirical research on creativity focuses primarily on the generation, adoption, and diffusion of creative ideas (Wang et al., 2008). This suggests a narrower interpretation of creativity than initially envisaged by Osborne (1953) and furthermore represents a gap in inter-firm cooperative relationship research studies. This research responds to (Hennessey, 2017) call for more research to recognise that creativity arises from a complex web of interrelated forces operating at multiple levels. This effort is in line with recent research on the relationship between creativity and design interventions (Cucuzzella, 2016).

To date, the explicit link between buyer-supplier interactions and creativity as a key driver for providing timely solutions to buyer demands has not been identified. Thus, there is a conceptual gap that this study fills by starting with a literature review to develop a model and concludes with several propositions for further research. In this study, our focus is to understand the role of creative thinking in enhancing a supplier's ability to engage with their customers in order to carry out new product development, with a special focus on green innovation to boost sustainability performance.

In this study, we link the relevant streams of literature from the fields of both buyer-supplier relationships and sustainability, which initiates the research process. The primary research questions for this study include: (1) How does supplier engagement allow for the development of green innovation for long-term sustainability management? and (2) How does creative thinking link the relationship between supplier engagement and green innovation for sustainability performance? The contribution of our findings to literature is three-fold. First, we develop a creativity framework based on the existing literature while proposing further research and relationship testing. This has been done in alignment with Osborne (1953) and consistent with findings by (de Medeiros et al., 2018). Second, we respond to previous calls by (Hennessey, 2017) to examine creativity as it arises from a web of interrelated forces operating at multiple levels. We contribute to the literature by suggesting that social capital (SC) embedded with much long-term buyer-supplier engagements contribute to information sharing, the facilitation of inter-firm resource exchange, and product innovation. From a conceptual perspective, this study contributes to the literature by suggesting that creative abilities and supplier engagement transforms into green innovation and sustainability performance. This study extends our understanding of how a balance between convergent and divergent thinking can contribute to a firm's green innovation by identifying the connection between creative thinking in buyer-supplier engagement, green innovation, and sustainability performance.

This paper is structured as follows: Section 2 briefly presents the theoretical literature supporting this study, Section 3 our methods, and section 4, a more in depth review on green innovation, creativity, and supplier engagement. Section 4 includes the discussion on the proposed conceptual framework and summarizes the connection between creativity and green innovation. Sections 5 and

6 present the implications and limitations and concludes by suggesting areas for future research on the topic. Section 7 outlines the conclusions.

2. Theoretical Development

Creative thinking and innovation have received increasing scholarly attention in the 21st century. Earlier research studies have shown that a number of factors affect organizational creativeness. The majority of research on creativity draws on the social capital (SC) theory (e.g., Sözbilir, 2018). Bourdieu (1985) defines SC as the combination of the specific sources of information that are associated with the acquisition of a long-lasting system of institutionalization. This capital involves shared acquaintance and acknowledgment. SC is based on networks and discovering different ways to utilize these networks in pursuit of advancing relationships and practices. Developing and maintaining a social relationship through involvement and participation in networks or groups can have tradeoffs for the individual (Portes, 1998). Further, Nahapiet and Sumantra(1998) define SC as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit”. Prior research suggests that firms’ SC plays an important role in the acquisition of information, cross-functional effectiveness, inter-firm learning, and good supplier relationships (Zhou and Poppo, 2010). According to (Portes, 1998), SC is a facilitator of relationships and boosts a firm’s ability to acquire resources through group membership in different networks and calls attention to non-monetary forms of resources. Further, (Laužikas and Dailydaite, 2015; Liu, 2013) argue that SC is an important facilitator of value, boosts creativity, and helps bring about combined knowledge and norms. Driven by the potential for low transaction costs, facilitating the exchange of resources, information sharing, and product innovation, SC may accelerate green innovation and create new products and services.

The resource-based view (RBV) views firms as composed of a set of resources, refers as resources refer to the tangible and intangible assets a firm and capabilities is defined as a firm’s capacity to deploy resources (Barney, 2001). The RBV has become important for explaining the triple bottom line performance of firms through managing and maintaining long-term relationships and may provide an opportunity to create new competencies and increase reputation (Sarkis, 2009). This study relies on the RBV as it is widely used in supply chain literature as well as literature on innovation and product development (Lau et al., 2010). Firm resources provide a strategic competitive advantage to companies by focusing on developing valuable, rare, and non-substitute resources and capabilities (Barney et al., 2011). Such valuable resources, both tangible and intangible, are firm-specific and important for innovation performance (Cheng and Shiu, 2015). This study relies on the SC theory for supplier engagement, which has many potential impacts on creativity, and RBV for green innovation.

3. Methodology

In this study, we employ a literature review approach to develop our conceptual model following the literature review methodology proposed by (Marying, 2000). Previous studies have used a similar literature review methodology. This approach consists of various steps. Appendix A summarizes the keywords utilized for this study, and Appendix B summarizes the definitions used. Appendix C provides a list of selected journals with publications involving creativity and green innovation.

The goal was not to analyze and synthesize the contributions of individual papers. Rather, we intended to develop a conceptual model of the role of creative thinking in developing inter-firm relationships and the impact of green innovation on sustainable performance. The aim of this study was to develop the conceptual framework and research propositions by examining publications in the scope of our topic and to suggest directions for future research. The aim was not to perform a bibliotic literature review, meta-analysis, or to segregate the research studies by the types of the journals, year of publications, authorship, or country of publication. In this study, we used “Scopus” and “Web of Science” as the search engines. Scopus and Web of Science are the largest databases with multidisciplinary comprehensive scientific data. In order to search relevant articles, we used generic keywords, including “creative thinking,” “stakeholders and green supply chain,” and “green operations” in both databases. Our search criterion included “Title, Keywords, Abstract”.

On each of these two databases, we focused on peer-reviewed articles. We only included journals, reviews, and papers written in the English language. We did not use chronological constraints. Initial shortlisting produced 317 results from Scopus, while Web of Science returned 276 results. After verifying and removing duplicate papers through Mendeley software, we found that out of 593 articles, 170 overlapped between Web of Science and Scopus. We read the abstract in order to eliminate irrelevant papers. We considered papers describing creativity at an organizational level, green operations in the green supply chain perspective, and its outcomes on sustainability. We include the papers that had at least one of the following words in the title, abstract, or in the text of the study (see Appendix A). Of these, 28 papers were eliminated after initial screening of titles, abstracts, and keywords that do not address research areas like, creative thinking, behaviors, green operations and green innovation. Thus, 295 papers were considered in this study.

4. Review of Relevant Literature

4.1 *Green Supply Chain Management and Green Innovation*

The earliest work on green supply chain was carried out by Ayres and Kneese (1969) and occurred much earlier than the establishment of the Environmental Protection Agency (EPA) in the United States. His work focused on evaluating the inter-organizational relationships and a concern for the process beginning from extraction and continuing to the disposal of waste back into the

system (Ayres and Kneese, 1969). Some of the earliest evidence of green supply chain can be linked to an emphasis on balance between the production and consumption in the supply chain. “Green Supply Chain Management” (GSCM) is a growing theme of interest in academia (de Oliveira et al., 2018). GSCM focuses on waste reduction, increasing product life, and process improvements (Srivastava, 2007). Further, (Sarkis et al., 2011a) categorize GSCM into inter-organizational practices of supply chain management. “*Sustainable supply chain management integration*” is a concept proposed by (Wolf, 2011). He suggests that organizational strategy integration leads to improved environmental performance. Whereas internal and external supplier integration enables the integration of “sustainability into supply chain management”. More recently, Sroufe (2018) goes on to suggest integrated management is a critical element of value creation for any business and supply chain. The term GSCM has been discussed in the literature and refers to various types of green practices (e.g. green purchasing, environmental management, customer cooperation, eco-design) performed by the organization to reduce their impact on the natural environment (Sarkis et al., 2010; Vachon and Klassen, 2006). Environmental management practices concern the policies and procedures of environmental management and ultimately the development of the best green practices (Sroufe, 2003). Internal activities of the firm, such as the development of the remanufacturing process and managing physical flow with eco-efficiency, are essential for environmental protection from an international business perspective (Guide et al., 2003).

GSCM is one kind of environmental management that seeks to minimize adverse environmental consequences, such as air pollution, material waste, and product dumping (Hervani et al., 2005). GSCM has evolved in an effort to include elements of ‘environmental management and supply chain management’ (Zhu et al., 2008). In fact, GSCM aims to integrate ecological problem into firms’ operations by reducing or eliminating unintended adverse consequences of the manufacturing process (Srivastava, 2008, 2007). Green innovation enhances environmental sustainability by emphasizing the idea of transforming a product’s design and manufacturing in a way that has little impact on the environment. In parallel, (Chen, 2008) suggests that green innovation (GI) is an environmental management concept that firms use to strategically reduce environmental pollution. Additionally, research indicates that GSCM stimulates the demands of GI and enables better performance (Lee and Kim, 2011). With a narrower focus on eco-design and manufacturing, GI can enable improvement in the practices of product design and the manufacturing process. Product design should focus on designing for easy reuse and/or simple product disassembly (Carter and Easton, 2012), and include recyclable and biodegradable material (Zhu et al., 2012). Green or environmentally focused process design includes practices that use less energy and consume fewer resources (Wong et al., 2012).

The definition of GSCM provides a robust way of understanding different aspects of green innovation. Drawing on GSCM concepts (Sarkis et al., 2011b; Zhu et al., 2008) and inspired by the work of Srivastava (2007) and guidelines of (Chen, 2008), GSCM is considered in the main

dimensions of green innovation (i.e. development of new products and process). GSCM and green innovation are strategically interconnected when developing new, environmentally friendly products (Seman et al., 2012). As for “eco-design” and “green operations” (Srivastava, 2007), the focus has recently been broader in scope: to create, deliver, and to maximize sustainability benefits through innovative products and processes (Lee and Kim, 2011). According to (Pigosso et al., 2013), “eco-design is a proactive environmental management approach that integrates environmental issues into product development and related processes”. Table 1 provides a summary of selected research and various internal and external GSCM and sustainable performance outcomes.

Author	Stakeholder-Types-Pressures	GSCM practices				Performance		
		IEMP		EEMP		ENP	ECO	OPF
		ECD	IEM	GP	COP			
Awan et al.(2017)	Stakeholders Pressure	Y	Y	-	-	Y	-	Y
Huang et al. (2015)	Stakeholder Pressure	Y	Y	Y	Y	-	-	-
Chien(2014)	Institutional Stakeholders	Y	Y	Y	-	Y	Y	Y*
Wolf (2014)	Stakeholder Pressure	-	Y	Y	-	Y	-	Y*
Zhu et al. (2013)	Institutional pressure	Y	Y	Y	Y	Y	Y	Y
Laosirihongthong et al. (2013)	---	Y	Y	Y	-	Y	Y	Y
Sarkis et al.(2010)	Stakeholder Pressure	Y	Y	-	-	-	-	-
Zhu et al. (2007)	---	Y	Y	Y	Y	Y	Y	Y
ECD: Eco-design IEMP: Internal environmental management practices; EEMP: External Environmental Management Practices; GP: Green Purchasing; COP: Cooperation; ENP: Environmental Performance;								

ECO: Economic Performance;
 OPF: Operational Performance;
 Note: Y*= Social performance

4.2 Creativity

Creativity enables a firm to broaden its knowledge base and to develop new products (Leonard-Barton, 1992). Creativity is a process of generating an idea or solution that must not only be original but must also solve a problem. Organizational creativity is useful in the development of new products, services, and ideas in a complex social system (Woodman et al., 1993). The United Nations Educational Scientific and Cultural Organization (UNESCO) recognizes the value of creativity in its 2013 Creative Economy Report (UNESCO, 2013). We also argue that creativity is an implicit part of the UN's efforts to include principles for responsible management education (PRME) in business schools and that creativity is an enabler of any of the 17 SDGs. However, in order to identify effective solutions to address sustainability problems, it is crucial to understand how creativity can be developed and promoted (UNESCO, 2016). Existing studies are primarily conducted using the SC theory due to its connection with various elements of organizational efficiency and creativity (Hsu and Fan, 2010; Laužikas and Dailydaite, 2015; Sözbilir, 2018; Wang et al., 2008). What these and other efforts call for is a different worldview, to re-imagine product and processes while considering a long-term perspective (Cucuzzella, 2016).

Creativity rests on two dimensions - originality and effectiveness. The originality dimension concerns newness or novelty of the solutions and the effectiveness dimension concerns the practicality of the idea in solving problems (Moreau and Dahl, 2005). In this study, creativity takes a broader perspective for solving problems related to the development of new products and processes that support a sustainable future not only for the current generation but also for future generations. Creative thinking involves reasoning and logic with five modes of thought: Perceptual thought, detecting stimuli and translating them; Creative thought, searching for patterns of relationships between perception and the individual's knowledge; Inventive thought, utilizing information from creative thought to then assemble a product; Metacognitive thought, evaluating the acceptable solution; and Performance thought, writing and initiative (Ebert, 1994). When combined, creativity and sustainability involve preservation, transformation, and novelty (Poldner et al., 2017). "Creativity arises from a complex web of interrelated forces operating at multiple levels" (Hennessey, 2017). We suggest that novelty, developed through interactions with social networks, help to build knowledge on new ideas and resolve conflicts through an increased amount of shared information and exchange of knowledge. Creativity is therefore considered a tangible organisational resource that affects organizational performance (Bharadwaj and Menon, 2000).

Given the employee's level of creativity, creativity could range from adaptations in the procedures to the development of new products. The thinking style is a core factor for creativity and brings about changes required for the implementation of the ideas (Shalley et al., 2004). For example, we often cannot distinguish a manual keyboard for a computer from touch keyboards. The basic concept, the keyboard, is the same. Only the appearance has changed. In creativity, a basic concept can have multiple ways to get to the same solution.

Sustainability is a complicated challenge that requires an openness to creative ways of thinking and new ideas (Kajzer Mitchell and Walinga, 2017). Creativity can lead a firm to accumulate more knowledge, which has positive impacts on the market and firm performance (Im and Workman Jr, 2004). Novelty can even influence the development of a competitive product advantage (Im et al., 2013). Creativity can be used to promote the message of what it means to be sustainable in the development of processes and products (Poldner et al., 2017). From the view of the buyer-supplier relationship, we define creative sustainability as thinking and finding novel ways to develop a production process and product service to integrate firm, environmental, economic, and social sustainability as well as to maintain a competitive advantage.

Figure 1, depicts these relationships. The model is proposed in the context of an established export manufacturing firm's relationship with sustainability initiatives and the firm's downstream and customers/buyers.

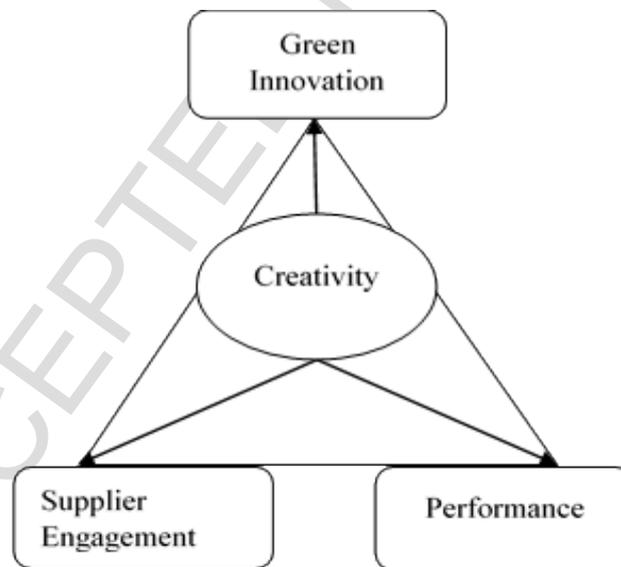


Figure 1. Conceptual Model of Creativity, Supplier Engagement, Green Innovation and Performance.

Table 2 consolidates the scholarly research on creativity and findings found in the literature.

Table 2 Summary of Relative Creativity Literature	
Author/s	Key Findings
Mitchell and Walinga (2017)	Propose that creative problem solving integrated with the comprehensive problem framing unlocks capabilities for practical knowledge and provides a path for organizations to get to more profound, breakthrough ideas for sustainability.
Poldner et al. (2017)	Suggest that translating a sustainability message into a tangible product involves the support of three techniques: preservation, transformation, and adding novelty.
Sierra-Pérez et al. (2016)	Results of the process were successful in regard to co-operation along with quantity and quality of ideas, with these recognized by searching, experimenting, participation, and knowledge sharing.
Przychodzen et al. (2016)	Findings include the assertion that effective leadership along with effective boundary spanning and clear profit alignment are concurrently important issues for the flourishing transformation of creative business ideas into growing sustainable products/services by business organizations.
Cucuzzella, (2016)	Highlights a range of development activities for idea generation and outcomes when contemplating temporal and spatial outlooks of design for sustainability.
Lozano (2014)	Mental models should be questioned by future creative thinkers in a continuous and evolving process. Working toward solving today's problems while informing future solutions and ensuring progress towards more sustainable societies.
Hansen et al. (2012)	Findings suggest that future research should consider the interaction between a constellation of creative factors – person, process, press, and product – when enabling creativity perspectives.
Bissola and Imperatori (2011)	Results confirm that creativity is related to planning for it. Demonstrates a more sophisticated and integrative approach according to individual creative competencies, team dynamics and organizational solutions that connect to each other to produce a common creative performance.
Stables (2009)	Encourages creativity and environmental sustainability in technology education through an eco-design capability approach.
Wang et al. (2008)	Results indicate trust and contact affect the three facilitators of inter-organisational creativity: (1) knowledge-sharing routines (resources), (2) learning orientation (motivation), and (3) managerial support and open-mindedness (managerial practices).

4.3 The Effect of supplier Engagement on Green Innovation

The literature shows that catalysing creativity for the creation of new products requires firms to build ties and bring heterogeneous expertise together, ensuring broad stakeholder participation (Foxon and Pearson, 2008). A recent study by Awan et al. (2018a) found that supplier-buyer engagement is essential for the adoption of new sustainability practices. The simplest form of this is a negotiated exchange in which actors are engaged in a joint decision-making process (Molm, 1990). When developing capabilities Foerstl et al. (2010) reminds us to look beyond sustainability to include organizational boundaries as necessary conditions to generate alternative sustainable solutions (Mitchell and Walinga, 2017). The social actors of the organization play a critical role in enhancing and creating learning capabilities through social capital (SC) and integrating business

activities (De Clercq et al., 2012). Chen et al. (2008) point out that SC provides access to resources and facilitates creativity. The findings reveal that organizational teams having strong relational ties are likely to access knowledge resources and gather information to exchange ideas and generate novel solutions. Similarly, a previous study by Sundgren et al. (2005) found that the exchange of information is positively associated with organizational creativity. Furthermore, SC improves relationships through collaboration built through the exchange of information, cooperation, and the sharing of resources. In this way, SC has a significant effect on the ability to create intellectual capital (Amabile, 1997). The intellectual capital perception of the workplace could certainly affect innovative work in the organization (Amabile et al., 1996; Nahapiet and Sumantra, 1998). SC is a key element in the transformation of a firm from being efficiency driven to being innovation driven as SC creates a competitive advantage for organizations. Creativity in business seems to be the result of collaboration and exchanges of ideas between individuals who work together collectively (Amabile & Khaire, 2008).

In recent years the concept of GI has gained attention as many research studies have examined the factors affecting green innovation (Chang, 2011; Hallstedt et al., 2010; Li et al., 2018; Lin et al., 2014; Song and Yu, 2017; Tseng et al., 2013). Some of this research is aimed at identifying factors affecting green innovation. For example, Lin et al. (2014) found market demands drive green innovation, Ford et al. (2014) found that institutional pressure affects green innovation, and others have found that corporate management ethics positively impact green innovation (Chang, 2011). Further, Dangelico et al. (2017) found that sustainability-oriented capabilities affect green innovation Jabbour et al. (2013) explored the relationship between green teams and environmental management. In the literature, there are some studies on how creativity impacts customer fulfillments (Triebswetter and Wackerbauer, 2008). Recently Albort-Morant et al. (2016) and Huang et al. (2016) have investigated antecedents of the green innovation performance.

Previous studies demonstrate that close collaboration with customers is positively associated with the development of new products and improvements to existing products (Tsai, 2009). Indeed, Nieto and Santamaria (2007) demonstrate a positive impact of collaboration on product innovation with marginal changes, yet it can negatively affect product innovation with new functions. Recent literature suggests that inter-organizational collaboration is important for innovation (Dong et al., 2017). The supplier engagement process is useful in generating sustainability-focused ideas and solutions that cannot be solved by creative thinking alone (Kajzer Mitchell and Walinga, 2017). Based on the literature and our research in this area, we suggest three key activities that are central to using supplier engagement for capability development that also fosters more sustainability specific knowledge. To this end, the more sustainability knowledge a firm possesses, the more likely it is to generate sustainable solutions. For sustainable supply chain management, we find three key activities are: (1) Reciprocal Information Exchange, (2) Commitment, and (3) Collaboration.

Commitment to sustainability relates to a firm's engagement with social or environmental initiatives to diminish the negative impact of their operations (Krause et al., 2009). Collaboration can form "the groundwork for a collective conscience for sustainability within the organisation and instill a sense of urgency for social and environmental issues along the supply chain regarding their being adequately addressed" (Oelze, 2017). Supplier engagement, therefore, means commitment; collaborating to meet the applicable regulations and supporting the reciprocal exchange of information across the supply chain partners. Thus, we define supplier engagement as the commitment, collaboration, and exchange of reciprocal information with buyers to achieve compliance with resources and priorities. Following this notion, we suggest that it is important for firms to have a high level of engagement with their external environment.

Transforming creativity into sustainable business practices requires understanding activities at different organizational levels that span the boundaries of the firm (Przychodzen et al., 2016). Also, suppliers may gain intangible, firm-specific knowledge due to the dependence of the relationship (Yan and Kull, 2015). These relationships should be aimed at catalyzing sustainability capabilities into products and services to develop creative ideas and skills. Thus, our hypotheses include:

Proposition 1: There is an association between the degree of supplier engagement and the development of product innovation and process innovation.

4.4 Green Innovation impact on performance

GI emphasizes improvements in the manufacturing process and product design that reduce pollution, save energy, minimize waste, and improve environmental conditions (Woo et al., 2014). Green innovation aims to develop processes that reduce energy consumption during production, minimize emission and waste generation, use renewable energy sources, and design for reuse and recycling in a closed loop system. Environmentally friendly production requires an understanding of processes, procedures, and evaluations of the efficient use of resources. Green innovation is emphasized as a key driver for competitive advantage because it has a positive impact on environmental performance. Green innovation is used to support environmental management performance and can be divided into "green product innovation" and "green process innovation" (Chen et al., 2006). Elements of sustainability also include equipment that controls pollution and promotes cleaner production technologies (Shrivastava, 1995). Cleaner production is defined as the high performing organizational strategy for achieving sustainable production, saving energy and resources, and minimizing emissions, which is distinct from end-of-pipe technologies (Hong and Li, 2013). Cleaner production technologies provide greater opportunities than ever before for modern companies to reduce and even eliminate waste streams associated with the design and use of disposable materials and products (Handfield, Walton, Seegers & Melnyk, 1997). Hence, cleaner production is considered a prime tool for combatting industrial pollution and achieving environmental and economic benefits (Tseng and Hung, 2014). Accordingly, cleaner production suggests that GI is undoubtedly important in the achievement of GSCM practices, as it helps to

fulfill the firm's environmental objectives and also enhances company performance outcomes (Seman et al., 2012) and Conding et al., (2012). Schot and Steinmueller (2016) stress that modifying the way we think or innovate is essential for transformational change. Innovation has been defined not only as a combination of new ideas and factors but also in regards to adaptation. One drawback is that innovation principles are potentially susceptible to instances of intellectual creative destruction (de Jesus et al., 2018).

The design of sustainable products and is a modern production concept (Burchart-Korol, 2011). It integrates new methods of production "to save the planet" and principles of green innovation (GI) (Arfi et al., 2018). GI includes reducing the environmental impact of a product through better design and sustainable processes that reduce waste, eliminates extra material, and reduces the use of energy and resources (Burchart-Korol, 2011). For example, Alcoa Corporation faced sustainability challenges during the construction of an aluminum smelting plant in Iceland. At Alcoa, sustainability-focused knowledge management empowered workers to dynamically interact with one another to share and improve knowledge that led to an improved understanding of green management practices (Spangler et al., 2014).

Some studies provide evidence that environmental management is related to improvement in environmental, operational and economic performance (Kuei et al., 2013; Shu et al., 2013b; Lau et al., 2010; and Chiou et al., 2011). Additionally, a significant and positive relationship exists between sustainability management practices and improving social sustainability performance (Sroufe and Gopalakrishna-Remani, 2018). Research by Song and Yu (2018) on the development of GI and creativity also points towards a positive influence on firm capabilities and sustainable development.

As one creativity centered activity, internal and external knowledge sharing practices contribute to green innovation (Noailly and Ryfisch, 2015). Designing green products and processes is helpful in reducing waste, mitigating air, land, and water pollution, and in reducing health risks to humans and other species. This process also attempts to conserve energy and materials, eliminate toxic substances, reduce waste produced during the production process, and establish the environmental, economic, and social objective of sustainability initiatives (Berkel et al., 1997). A key characteristic for developing capabilities among the supply chain partners is that of focusing on the most appropriate knowledge driven practices and strengthening relationships (Handfield et al., 2002)

Proposition 2: Product innovation is associated with (2a) environmental performance improvement, (2b) operational performance improvement, and (2c) social performance improvement.

Proposition 3: Process innovation is associated with (3a) environmental performance improvement, (3b) operational performance improvement, and (3c) social performance improvement.

4.5 Support Factors – Creativity, Green Innovation, and Sustainability

Creative thinking within an organization can lead to improved innovation. The development of knowledge transfer abilities leads to improved innovation activities (Xie et al., 2016). This supports the argument that the transformation of the externally acquired knowledge is considered an important method by which to improve the firm's green innovation. Creative thinking can be regarded as an inimitable resource available to an organization which can produce a given amount of novel ideas. Creative thinking is an important source for the successful transformation of knowledge. Creative thinking is growing in popularity in terms of research question from supply chain practitioners surrounding the implementation of innovation for products and processes. Creative thinking is defined as a specific cognitive style of processing information (Hou et al., 2011). Employee creativity is defined as the production of novel and useful ideas for addressing the incremental development of products, process, and procedures (Zhou and Shalley, 2003).

Previous research on green innovation has highlighted the importance of collaboration with suppliers and business partners to exchange knowledge and enhance learning. Some previous studies have examined the role of external factors affecting green innovation (Ford et al., 2014; Tseng et al., 2013). A few earlier research studies looked into the internal organizational factors that have an effect on green innovation and have discovered that green creativity is vital for enabling green product and process innovation (Song and Yu, 2018). Coordination and social ties are important drivers of green innovation (Tariq et al., 2017). Some studies argue that collaboration between external partners contributes to the development of green products and processes (Cai and Zhou, 2014; Quist and Tukker, 2013).

Guilford (1956) identifies two distinct dimensions as outcome criteria of the creativity construct: convergent thinking and divergent thinking. Both are important for problem-solving. Convergent thinking is defined as “the ability to apply conventional and logical search, recognition, and decision-making strategies to stored information to produce an already known answer” (Cropley, 2006). Divergent thinking brings forth answers that may never have existed before and produces novel solutions to a single problem (Cropley, 2006). The use of creative thinking offers an opportunity to engage in joint problem solving where resource building is a key driver for sustainability (Mitchell and Walinga, 2017). Convergent and divergent thinking have become important aspects of problem-solving and are considered necessary capabilities for work (Shalley et al., 2004). Divergent thinking encompasses constructing other creative ideas, discovering solutions that enrich the possible benefits as well as avoid the dependence on long-established contemplating techniques to make it to some remarkable solution. Conversely, convergent thinking includes making judgments to help decide among the ideas coming from external sources, refining and ultimately coming to a final decision (Gundry et al., 2014).

Kajzer Mitchell and Walinga (2017) propose that developing sustainable solutions depends on a group's practical knowledge and growing expertise in the areas of climate change, toxic emissions, and social inequalities. We argue that individual creative thinking styles may significantly aid in the understanding of the needs and requirements of customer demands. However, inter-firm collaboration may not always be beneficial for innovation (Monjon and Waelbroeck, 2003). Nieto and Santamaria (2007) demonstrate a positive relationship between collaboration and product innovation, and it does negatively affect product innovation with new functions. We argue that creative approaches allow managers to filter information in new ways as part of the buyer-supplier engagement process. For example, Hahn et al. (2014) found complex environmental, economic, and social considerations may promote creative insights. These insights can lead to the innovation of more novel and useful products. They further described managerial scanning, interpreting, and responding as important to understanding sustainability issues. In this perspective, collaboration enables joint problem solving, insights about customer culture, reducing differences, and understanding preferences for social initiatives (Awan et al., 2018). In line with this, Przychodzen et al. (2016) viewed collaboration as the ability of firms to successfully transform creative ideas into successful sustainable products.

The goal of creative thinking is to transform innovative ideas into new products or services that significantly impact supplier engagement. There is growing interest in the link between collaboration, or the involvement of customers in product development (Lau et al., 2010), yet there is some evidence of skepticism as to the effectiveness of supplier engagement on the firm's success in using innovative practices in the development of new products and processes. One explanation for the mixed findings could be the limitation of understanding of how creative thinking moderates the relationship between supplier engagement and green innovation. Therefore, the way in which creative thinking affects the relationship between supplier engagement and green innovation is worthy of further study. Thus, our hypotheses include:

Proposition 4: Convergent and divergent thinking abilities moderate the relationship between supplier engagement and product innovation and process innovation.

4.6 Moderating the Impact of Creativity on Performance

Creative thinking can impact the success of new product development and new product marketing. It encompasses the recognition and transformation of ideas into new products and services (Przychodzen et al., 2016). Our study focuses on two perspectives of creativity: novelty and usefulness (Amabile, 1983). It is necessary to understand the concept of creativity and the relationship between novelty and usefulness because these relationships lead to implementation (Litchfield et al., 2015). From an organizational perspective, novelty is defined as "new to other ideas currently available in the organization" (Shalley et al., 2004). Novelty refers to the degree to which outputs are perceived as new and different from those previously produced. Usefulness refers to the extent to which outputs are perceived as functional and appropriate for the target audience

(Amabile, 1983). Consistent with Shane and Ulrich (2004), our study considers novelty and usefulness as conditions for successful product design and development. Novelty can be organized into three categories: newness, frequency, and distance. Newness is when an idea has never been mentioned in the specific context in question. The level of frequency defines the extent to which the idea is present in a set of ideas. Distance is such that creativity does not imply any specific limits in distance from current practice (Litchfield et al., 2015).

Usefulness can be organized into two categories: feasibility and value. The feasibility dimension “looks at the ability to practice or to be implemented and come up with new product ideas that are appealing not only to an individual user but also to broader parts of the market” (Poetz and Schreier, 2012). The value dimension indicates the extent to which the idea may facilitate the generation of other ideas and the achievement of goals (Ahuja et al., 2013). In the synthesis of these two concepts, we propose that creative ideas can exert significant influence as a boundary condition for the development of entirely new products and services. Consequently, effective creativity can transform ideas and skills into innovative products and services. Additionally, the creative thinking process allows more ideas to enter the innovation and implementation stages of the green innovation process. Hence, the new products and services that are developed through green innovation may be more successful in generating sales and reducing environmental impact. Sustainability is a systemic challenge, and it is essential that organizations respond to these challenges with creativity to help improve social and financial resources (Lozano, 2014). These processes inform the development of sustainable solutions that are relevant and necessary for problem-solving that involves complex sustainability challenges (Mitchell and Walinga, 2017). Such new insights can also guide managerial actions in the design of organizational systems that foster collective creativity and, in turn, organizational performance (Cirella et al., 2014). Recent research indicates that the extent to which green innovation transforms a firm’s performance is shaped by management (Przychodzen et al., 2016). Yet, there is some ambiguity around the consequence of green innovation on firm overall performance (Tang et al., 2018). The importance of future research is evident in the absence of any kind of consensus surrounding the most effective procedure for supporting the role of green innovation on firm performance. Based on the potential role of different factors for the transformation of green innovation into sustainable performance (Przychodzen et al., 2016; Testa et al., 2016). We suggest that the level of creative thinking (novelty and usefulness) affects the relationship between green innovation and sustainable performance.

It has been argued that innovation contributes to a firm’s overall performance (Aguilera-Caracuel and Ortiz-de-Mandojana, 2013; Tang et al., 2018) and environmental performance (Costantini et al., 2017). We propose that the development of green products will result in better environmental performance, social well-being, and an increase in economic performance. (Sarooghi et al., 2015) found a significant association between creativity and green innovation. The use of divergent thinking often results in the discovery of new ideas. The execution of a new idea

can lead to the development of new products and processes (Gundry et al., 2014). Following (Chen et al., 2006), we define process innovation as the extent to which organizations are able to look for new ways for selecting raw materials with lower environmental impacts, practice green management, use less energy, and reduce material waste. This study referred to (Dangelico et al., 2017) and defined a “green product” by the extent to which the new product reduces materials, improves product design for easy repair, disassembly, recyclability, reuse, and energy efficiency. Firms that focus on green innovation may have more developed green processes, implement cleaner production technologies, and reduce waste generation through recycling and designing products that are easily disassembled while improving economic performance and creating job opportunities. These types of initiatives have a significant positive impact on the environment and on social well-being. Some previous studies argue that the use of the green product and process innovation is one of the key factors affecting environmental and economic sustainability and can improve quality of life (Dangelico and Pujari, 2010).

We define the economic performance based on green innovation as the extent to which an organization achieves sales growth in the market, increased profits, improved product image and reduced marketing costs. In line with the discussion in the literature, we base our arguments on developing new theoretical perspectives involving creativity. By combining various dimensions of creative abilities (novelty and usefulness), we suggest that creative ideas that are high in value and high infeasibility may have a positive and significant influence on the design of products and processes. Our literature review informs a proposed conceptual framework, shown in Figure 2, and additional hypotheses:

Proposition 5: Creative novelty and usefulness moderate relationships between product innovation and process innovation; (5a) environmental performance improvements; (5b) Social performance improvements; and (5c) Operational performance improvements.

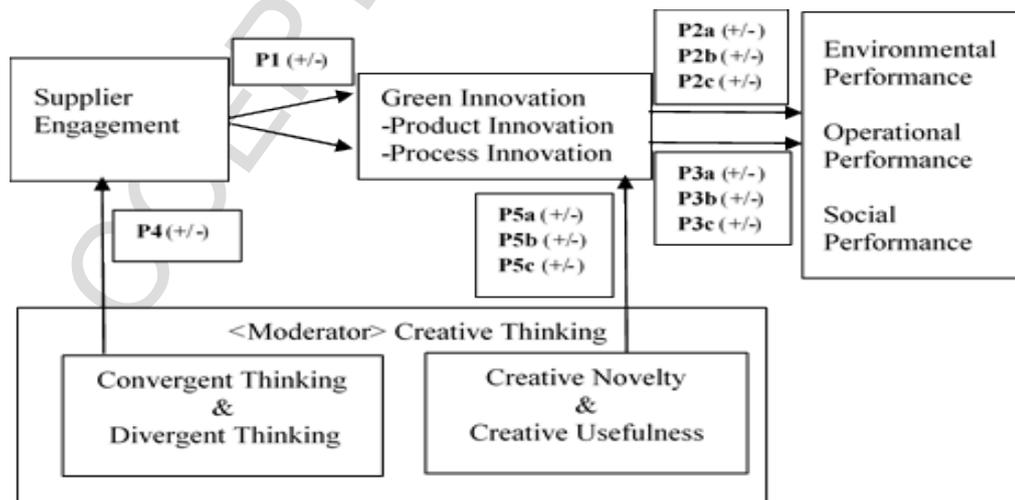


Fig.2 Conceptual Model of Creative Abilities

5. Discussion

This study contributes to operations management literature by linking supplier engagement and green innovation. We argue, due to the limited expertise and knowledge of suppliers, that the successful development of green innovation will depend on utilizing divergent and convergent creative thinking approaches, as well as managing supplier engagement to achieve shared goals. It is unlikely that export manufacturers from developing countries have all the relevant knowledge and expertise necessary to design new products and services. Therefore, supplier firms need to work with their external customers in order to collaborate and gather information to design new products and processes. Buyer-supplier engagement constitutes a rare and valuable resource for the development of green innovations. We propose that creative thinking will help to frame sustainability challenges as part of supplier engagement, which will result in the development of more creative solutions to the world's sustainability challenges and the UN SDGs. This study extends our understanding of how creative thinking can affect supplier engagement and green innovation, along with environmental, operational, and social performance. Our analysis suggests that creative abilities does have relevance to firms for the development of green innovation, strategy and sustainable development. The proposed direction and strength of the relationship between supplier engagement, green innovation, sustainability performance, and the role of creative abilities are within Figure 2.

In our synthesis of the relevant literature and the development of research propositions, we propose that creative thinking may moderate the relationship between supplier engagement and green innovation. This study advances the knowledge regarding the importance of relationships with customers as being a requirement for implementing sustainability practices (Klassen et al., 2003; Kumar & Rahman, 2015; Chen et al, 2017). Future research should aim to address key aspects of whether and to what extent supplier engagement sustains the effectiveness of green innovation over time. Therefore, next, we present a set of future research questions dealing with supplier engagement and green innovation:

RQ1: Is supplier engagement positively associated with the development of green innovation? A crucial avenue for future research is conducting a closer inspection of “creative problem-solving approaches” (Mitchell and Walinga, 2017). The concepts of “organizational creativity” and “sustainability” will be particularly important for environmental preservation and management (Shrivastava, 2014). This is especially true for creative problem-solving that draws on convergent and divergent thinking as Moderators in the framework. Thus, the second set of research questions that deal with how divergent thinking and convergent thinking influence supplier engagement and green innovation include:

RQ2: How do convergent thinking and divergent thinking influence supplier engagement for the development of product innovation and process innovation?

RQ3: Is the success of supplier-buyer engagement affected by creative thinking?

Furthermore, future research should include the examination of different sub-behaviours within the broader concept of creativity, such as novelty and usefulness (Amabile, 1983). The prioritization of novelty and usefulness can enable a unique approach to re-design during the implementation stage of sustainable solutions at an operational level. Creativity, sustainable design, and risk management will be particularly important criteria for re-design (Cucuzzella, 2016). Thus, we propose a third set of research questions that address the green innovation and sustainable performance outcomes reviewed in this study:

RQ4: How do managers adapt to creative novelty and usefulness to cope with the challenge of operational strategy, while including enhanced sustainable performance outcomes?

RQ5: Does creative thinking support or hamper sustainable performance outcomes at the operational level? If so, why?

This study lays the groundwork and provides a call for future research studies to conduct quantitative testing of the conceptual framework in order to derive reliable constructs, item measures, relationship testing, and practical implications for both industry and academia. The effect of buyer-supplier engagement on green innovation can be altered by several creative thinking factors.

6. Implications for Practice

Our conceptual framework is a relevant tool for managers. Firms with the intent to achieve better green innovation should prioritize the integration of creative thinking. Improved sustainability practices mean better social interactions. This may be enabled by creative thinking toward green innovation that generates outcomes which align with sustainable development.

To enable the relationships proposed in the conceptual model, managers from multi-national firms should establish teams composed of members who are capable of divergent thinking beyond acceptable practices of inter-firm cooperation. When integrating sustainability into an organization (Sroufe, 2017), managers should recognize the importance of a creative workforce as a resource that contributes to the firm's success and on-going sustainable development. Large manufacturing firms should not purely focus on external relationships, but they should also apply creative approaches to develop green innovation and achieve sustainable performance.

Small firms, for example, have fewer financial resources, strong sustainability initiatives, and significant product and process development experience, which would facilitate inter-firm collaboration for the development of green innovation. In this situation, we may suggest that small firms should put more resources into creative thinking initiatives to achieve their performance and sustainability goals. We would advise practitioners to move from traditional capabilities to creative abilities to achieve sustainability objectives in all spheres of firm operations. From a managerial

perspective, our framework suggests that creative thinking and supplier engagement is necessary for the improvement and implementation of green innovation. Our framework reveals that managers may utilize both convergent thinking and divergent thinking in order to identify new ideas and refine existing ideas for green innovation in their organizations. Our framework has posited that the development of green innovation lies in the utilization of convergent and divergent thinking.

Creative thinking for strategic sustainable development has attracted increased attention from researchers in recent decades and has become an important strategy to help organizations survive in the 21st century. We advise managers to maintain a balance between innovation and efficiency management. Managers will need to make the effort to foster a culture that emphasizes creativity and design thinking while, at the same time, continuing to carry out the procedures necessary for managing daily core business processes. Managers face a dilemma in developing both innovation and efficiency management practices simultaneously.

Efficiency is defined as “a comparison between inputs used in a certain activity and produced outputs” (Aubyn et al., 2009). It is necessary for managers to systematically integrate the past experience into day-to-day operations and to help build managerial processes for successful innovation in product development. We suggest that organizations establish creative/innovative teams within the department in order to realize the benefits from integrating these team into core business operations. A balance between innovation activities and core activities is necessary for the effective transformation of green innovation for value creation.

7. Limitations and Future Research

We acknowledge that within our scope of work, green innovation and creativity limits our study and these practices do not map into all of the UN SDGs. Our study did not restrict the analysis to a systematic literature review. Rather, articles came from multiple research sources and from prior knowledge of the researchers. Hence, the resulting conceptual model has been developed primarily by way of reviewing a field of research that focuses on creative approaches to green innovations. The systematic literature review has some limitations in that it restricts the use of a database search to specialized terms and potential journals. While the use of this methodology is supported by other literature reviews found in journals (Ahuja et al., 2013; Durach et al., 2015). The study’s findings are limited by the methodological frame of reference. Future research can develop across longitudinal industry approaches to secondary data collection in order to assess how relationship fairness influences the co-development of sustainability performance among supply chain members. Creativity and sustainable development are of growing interest for organizations and academicians. Research related to the creative abilities concept within the boundaries of green innovation and sustainable development has gained attention in recent years.

Creative thinking can be integrated into operations strategy to support the development of circular economy innovation. Further research is needed on the influence of creative thinking on product and process design that supports recovery, reuse, and transformation of materials into upcycled products. The influence of creative thinking on green innovation is becoming increasingly prominent in many areas of innovation and circular economy research. Future research should investigate the drivers of creativity, such as the catalysts for new product development, interaction orientation, and customer orientation in relation to product development and firm performance. Future research should seek to identify green human resource management practices that enable creative thinking and aid in decision making for product and process innovations in circular economy models. Future studies should also examine how transactional and servant leadership styles enhance group or individual employee creativity by encouraging design thinking. Another direction for future research is to examine the impact of convergent and divergent thinking on the design thinking process. It would be interesting to investigate convergent thinking as a moderator in the relationship between design thinking and innovation.

This study was founded on research gathered through a literature review. The opportunities remain for primary data collection and a multiple case study approach to how creativity impacts early supplier engagement and sustainability performance. Finally, there is an opportunity for research that examines what factors of creativity influence the transformation of green innovation into sustainability in a manufacturing context. We suggest that future in-depth research studies should focus on a single, best-in-practice firm from a developed country in order to provide insights into the extent to which creativity is linked to sustainability within exemplary, top-ranked firms. To further explain why and how creativity enables sustainable performance, we suggest data collection that tests the proposed model using a purposeful sampling methodology in order to identify whether the key respondents are actively engaged in introducing new or improved practices.

8. Conclusions

This research has focused on addressing two primary research questions: (1) How does supplier engagement allow for the development of green innovation for long-term sustainability management? and (2) How do creativity capabilities trigger the relationship between supplier engagement and green innovation for sustainability performance? This study provides insights into how manufacturing firms can develop green innovation through supplier engagement and by using creative thinking to enhance external knowledge sharing practices. Our theoretical framework reveals that organizational creativity is likely to strengthen the relationship between supplier engagement and green innovation. This study has the potential to contribute to our understanding of the significance of creative thinking in enabling green innovation. We propose that creative ability is something every organization should consider when looking for sustainable solutions. For

integrating all three dimensions of sustainability – economic, environmental, and social – it is important to encourage creative thinking within the organisation to enable problem-solving approaches that drive green innovation.

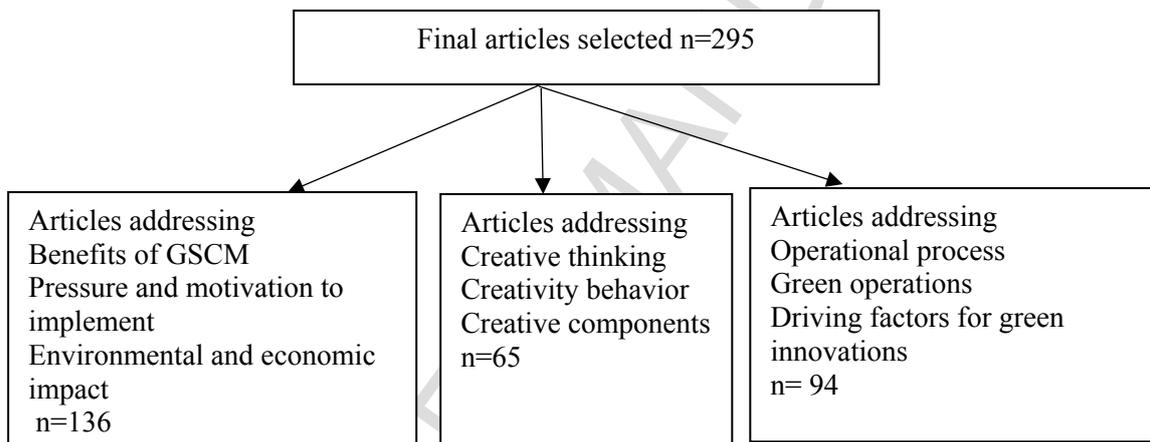
Creative thinking is becoming an important tool for green innovation and sustainable development. Manufacturers striving for green innovation through buyer-supplier engagement should focus on cultivating a culture of creative thinking within their organizations. We propose that convergent and divergent thinking are powerful tools for supplier engagement. This finding is significant considering that supplier engagement is considered the most significant resource of firms and a source for producing innovative products and processes. Through creative thinking, a firm may increase its problem-solving abilities and apply these abilities in the development of more green products and processes. Divergent thinking includes the generation of many ideas for problem-solving, whereas convergent thinking focuses on reasoning and critical thinking for learning and implementing ideas. Creative thinking is making its way into green innovation strategies in green supply chain management. We propose that creative thinking approaches within manufacturing firms can help drive necessary green innovation in the development of new products and services. The novelty and usefulness of ideas are important criteria for creative thinking in the development of new products and processes that enhance organizational sustainability.

Creativity boosts environmental and economic performance by enabling the development of green products and processes. Creative thinking has become an important tool driving green innovation within organizations and plays a critical role in enhancing sustainability performance. The contribution of our findings to literature is threefold. First, we further develop the creativity framework based on the existing literature while proposing further research and relationship testing. In alignment with (Osborne, 1953) and consistent with the findings by (de Medeiros et al., 2018), our conceptual framework suggests that upstream creativity is based on idea sharing and the generation of alternative solutions through coordination, collaboration, and the exchange of information, and that this may positively impact the development of green innovation. Second, we respond to previous calls by (Hennessey, 2017) to examine creativity as it arises from a web of interrelated forces operating at multiple levels. Creativity has the potential to reposition a firm's sustainability performance in a globalised environment. Finally, from a social capital perspective, this study contributes to the literature by suggesting that creative thinking enables firms to focus on strong cooperative relationships that facilitate inter-firm resource exchange and furthermore influence green product and process innovation.

Creative thinking is a fast-growing topic among the global community for the way that it enables sustainable development initiatives. Embracing a broader view of upstream and downstream creative abilities might be one way to build green innovation practices and increase knowledge on customizing efforts made to achieve sustainability goals. We suggest that upstream creative abilities can result in green innovation that leads to new breakthroughs in the management of

sustainable development happening downstream in value chains. The conceptual model is generalizable. If applied to major manufacturers, the conceptual model can help ensure that industries are contributing to the UN SDGs and increasing global sustainability. Creative thinking is a key element of the triple bottom line performance view of sustainability on both a local and global scale. In summary, we anticipate that the given framework may lead to the continuous development of management practices that support the growth and development of green products and processes. Lastly, we believe that this framework is strongly related to green innovation in the way in which firms can stimulate and support the development of green solutions and consequently enable increased sustainability performance.

Appendix A. The key words included in this study



Appendix B. Definitions

Creativity	Creativity is defined as the generation of creative ideas, adoption, and diffusion of creative ideas (Wang et al., 2008).
Supplier Engagement	Supplier engagement defines as a series of initiatives and actions to deal with challenging situations (Saunders et al., 2015).
Green Innovation	Green innovation definitions refer to products, processes or management practices aimed to reduce the environmental impacts (Kemp and Pearson, 2008).
Green Product Innovation	Green product innovation is the production of a new product or service that inflicts no negative impact on the environment or less than the current or competing product (Wong et al., 2012).
Green Process Innovation	Green process innovation is the improvement of existing production processes and use of environmentally friendly technologies to produce goods and provide services that impose no or reduced the negative impact on the environment (Wong et al., 2012).
Green Supply Chain Management	Activities involved in sourcing green procurement, environmentally friendly production practices, raw material management, ecological distribution, reverse logistics management activities and fulfillment of customer's needs through green marketing (A. a. Hervani et al., 2005).
Green Supply Chain Management	Management of material flow as well as green purchasing to integrated lifecycle management flowing from supplier to end customer and closing the loop with reverse logistics management (Zhu et al., 2008).
Green Supply Chain Management	A buying organization's plans and activities that integrate environmental issues into supply chain management in order to improve the environmental performance of suppliers and customers (Lee and Klassen, 2008)

Appendix C. List of selected journals with more publications about creativity and green

innovation

Journals	Creativity Publications	Green Innovation Publications
<i>Journal of Cleaner Production</i>	5	4
<i>Journal of product innovation management</i>	5	-
<i>Journal of business ethics</i>	-	4
<i>Academy of Management Review</i>	3	-
<i>Business Strategy and the Environment</i>	-	3
<i>International Journal of Production Economics</i>	-	3
<i>Journal of Operations Management</i>	-	2
<i>Creativity and Innovation Management</i>	2	-
<i>Journal of Management</i>	2	-
<i>Academy of management journal</i>	2	-
<i>The Journal of Creative Behavior</i>	2	-
<i>Management Science</i>	2	1
<i>Creativity research journal</i>	1	-
<i>Production and Operations Management</i>	1	1
<i>Journal of Environmental Management</i>	-	1
<i>Journal of management studies</i>	1	-
<i>Journal of Consumer Research</i>	1	-
<i>Technovation</i>	1	-
<i>Journal of personality and social psychology</i>	1	-
<i>Group and Organization Management</i>	1	-

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Highlights

- Creative thinking is crucial in achieving the United Nation's Sustainable Development Goals (SDGs).
- Development of a conceptual model of creative abilities from a systematic review of the literature.
- Creative abilities coupled with supplier engagement help transform business practices into green innovation and sustainability performance.
- Sustainable development is not just the result of green innovation, it also depends on creative abilities and supplier engagement practices.
- Businesses can achieve sustainable development goals when using creative approaches as part of supplier engagement practices enabling green innovation.