Towards an integrated conceptual model of supply chain learning: an extended resource-based view

Yang Yang
School of Management, Xiamen University, Xiamen, China
Fu Jia
The York Management School, University of York, York, UK, and
Zhiduan Xu
School of Management, Xiamen University, Xiamen, China

Abstract

Purpose – The purpose of this paper is to systematically review the academic literature on Supply Chain Learning (SCL), including the definitions, drivers, sources, barriers and consequences of SCL, and to propose an integrated conceptual model.

Design/methodology/approach – A systematic literature review has been conducted, with an analysis of 123 papers in peer-reviewed academic journals published from 1998 up to March 2018.

Findings – Through analysis and synthesis of the literature, this paper identifies and classifies the concepts of SCL into four types, that is, process orientation, structure orientation, consequence orientation and other informal definitions. Based on the Extended Resource-Based View (ERBV), the authors develop an integrated conceptual framework, which brings together various constructs. Within the framework, the authors identify the drivers and sources of SCL at intra- and inter-organizational levels. SCL consists of exploratory and exploitive learning capabilities, and the outcomes of SCL are dynamic supply chain management capabilities and sustainable supply chain performance.

Originality/value – The authors propose a capability perspective of SCL and develop a conceptual model and a number of associated propositions of SCL based on the ERBV and review findings, which is subject to future empirical testing and propose five future research directions. The findings of this paper can be extended beyond the dyad and be applied in multi-tier supply chain context.

Keywords Supply-chain management, Literature review, Dynamic capabilities, Supply chain learning, Sustainability performance, Environmental uncertainty, Extended resource-based view, Supply chain capabilities

Paper type Conceptual paper

1. Introduction

An organization's ability to accumulate knowledge about customers, suppliers and other major participants in its supply chains (SCs) has emerged as an important theme (Willis *et al.*, 2016) because learning among SC partners is a strategic action (Yang, 2016). Butner (2010) introduced the Smarter Supply Chain of the Future concept to emphasize SCs' learning ability (Willis *et al.*, 2016). Learning is an intangible strategic resource in SCs (Biotto *et al.*, 2012). In the SC context, researchers have shown that learning is both a competence and a bonding element that is deeply embedded in supply relationships (Hult *et al.*, 2003). Echoing this and building on dynamic capabilities theory (Teece *et al.*, 1997; Defee and Fugate, 2010), Defee and Fugate (2010) consider learning in the SC as dynamic supply chain management (SCM) capabilities. SC helps firms anticipate and seek out creative problem-solving, develop effective new processes (Yu *et al.*, 2013), drive supply management success (Das and Teng, 2000) and create a sustainable competitive advantage (Yang, 2016). Some firms present themselves as good examples to explore or exploit both internal and external market information to gain long-term competitive advantage (Hauser *et al.*, 1996) and invest substantial efforts and capital into becoming learning-oriented organizations (Marquardt and Reynolds, 1994). For example, Toyota is widely recognized as a leader in organizational learning and continuous improvement (Dyer and Kentaro, 2000). It relies on three key processes – supplier associations, consulting groups and learning teams – to form a high-performing knowledge-sharing network (Dyer and Hatch, 2004). However, there is scant literature that summarizes existing research on learning in a SC context and develops a

The current issue and full text archive of this journal is available on Emerald Insight at: **www.emeraldinsight.com/1359-8546.htm**

Supply Chain Management: An International Journal
24/2 (2019) 189–214

[DOI 10.1108/SCM-11-2017-0359]

The authors appreciate the financial support from The Ministry of Education of Humanities and Social Sciences project (Grant number: 17YJA630034) and the Natural Science Foundation of Fujian Province of China (No. 2017J01519).

Received 7 November 2017
Revised 3 April 2018
3 June 2018
9 June 2018
Accepted 11 June 2018

conceptual model based on the discussion of the drivers, sources, barriers and outcomes of SCL.

Inter-organizational learning may occur between any two organizations, whereas SCL only takes place in SCs (going beyond a dyadic relationship) and ideally would involve suppliers and customers coming together (Flint *et al.*, 2008). In this study, we adopt a broad view of Supply Chain Learning (SCL) and consider it as learning throughout either the SC or at least three tiers (focal company, a supplier and a customer) thereof, along with learning at a dyadic level, for example, learning either between the focal company and its customers or between the focal company and its suppliers, but not both. Specifically, this research focuses on learning that takes place in inter-organization relationships among multiple SC organizations to develop, share and collaborate about the SC, product problems and potential solutions (Flint *et al.*, 2008).

The purpose of this paper is to summarize existing research on SCL and learning in SCs and to propose an integrated conceptual model. This is accomplished through a content analysis of all the identified articles in Web of Science and Scopus databases from 1998 to March 2018, examining how the concept of SCL developed and investigating the drivers, sources, barriers and outcomes of SCL. Based on critical discussions of the literature, a conceptual framework is derived, together with six propositions that explain the relationships among the key constructs/themes identified. Finally, we summarize the gaps in the existing research and recommend some actionable future research directions. By doing so, we address the following research questions (RQs):

RQ1. What are the drivers, sources, barriers and outcomes of learning in the SC context?

RQ2. How are the drivers, sources and outcomes of learning integrated to form a framework?

RQ3. What are the gaps in the existing SCL-related research and the directions for future research?

The rest of the paper is structured as follows. Section 2 introduces the detailed review research approach and provides a descriptive analysis. Section 3 presents the thematic analysis. Section 4 presents the integrated conceptual model, building on the ERBV. Section 5 discusses the gaps in the research and provides directions for future research. Section 6 concludes the paper.

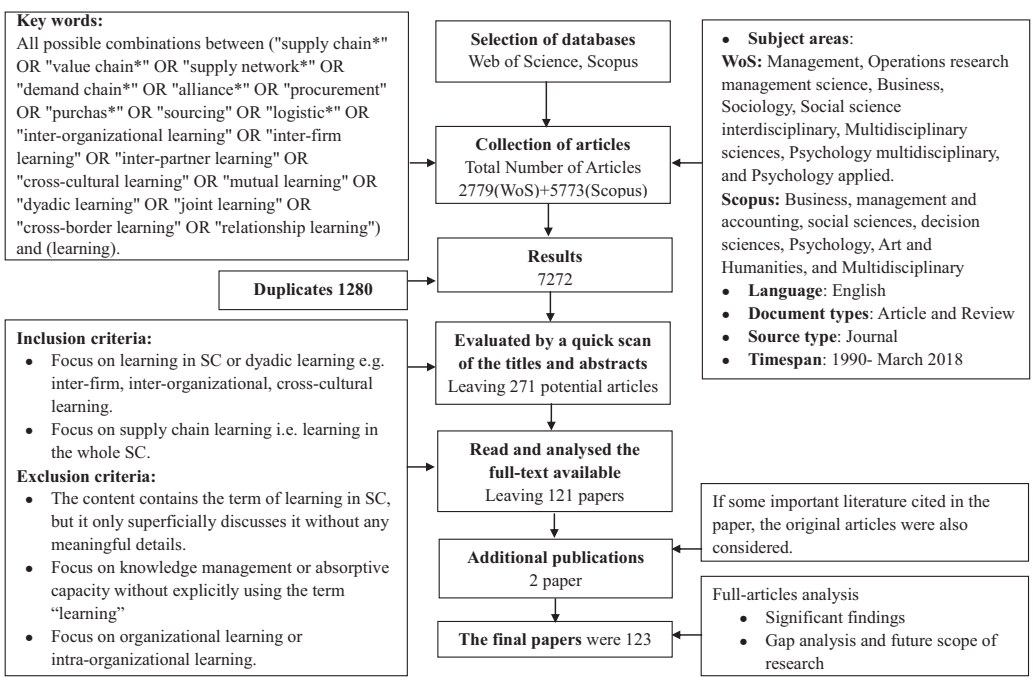
2. Research approach and descriptive analysis

2.1 Research approach

A systematic literature review (Tranfield *et al.*, 2003) was conducted to expand the scope of the identified peer-reviewed articles that focus on "learning in the SC context".

First, we searched all possible combinations between ("supply chain*" OR "value chain*" OR "supply network*" OR "demand chain*" OR "alliance*" OR "procurement" OR "purchas*" OR "sourcing" OR "logistic*" OR "inter-organizational learning" OR "inter-firm learning" OR "inter-partner learning" OR "cross-cultural learning" OR "mutual learning" OR "dyadic learning" OR "joint learning" OR "cross-border learning" OR "relationship learning") and (learning) in the two most comprehensive research databases of "Web of Science" (WoS) and "Scopus". The keywords were selected based on Gosling *et al.* (2016). The "*" sign was used at the end of some keywords to expand the range of possible studies (Gimenez and Tachizawa, 2012). We then selected the most relevant subject areas (Figure 1). We also searched for English-language articles in peer-reviewed journals. The document types were chosen as "article" or "review". As a result, 2,779 and 5,773 related papers were found at WoS and Scopus, respectively. Second, we found and discarded 1,280

Figure 1 Review methodology



duplicate articles, and 7,272 remained for further screening. We then evaluated the articles by scanning the titles and abstracts and applying the inclusion and exclusion criteria presented in Figure 1. This process resulted in 271 potentially relevant articles that were included in the full-text review. Third, we then read and analyzed the full texts and identified **123** papers to include in this review. The review methodology is shown in Figure 1. The inclusion and exclusion criteria were determined through discussion by the research group. The whole process was carried out by two researchers independently, and if there was any disagreement, then they will discuss either to reach agreement or seek a third opinion from another member of the team before reaching agreements on all coding items.

2.2 Descriptive analysis

The initial result provides an overview of the quantifiable statistics on the final sample of 123 articles published towards the end of March 2018. The distribution of the publications, organized by year, is indicated in Figure 2. The first published papers found were published in 1998. The trend can be divided into two phases: (1) the initial growth phase between 1998 and 2007 and (2) the development phase between 2008 and 2018. There was a constant increase in the number of publications until 2008 and a sudden spurt in the number of publications during the following few years, except for 2009 (four papers). The peak was in 2016. Nearly 80 per cent of the papers were published in the last ten years (2008-March 2018), with a substantial number of papers published each year.

We identified 64 publications that focused on learning in SC. Figure 3 shows the distribution of the top eight journals, each having published more than three of the articles in the sample. It is worth noting that the list of journals accounts for approximately 37 per cent of the reviewed publications and that the journals included play dominant roles in this research field. We can see that *Supply Chain Management: An International Journal* tops the list with eight articles, followed by *International Journal of Operations & Production Management* (seven), *Industrial Marketing Management* (seven), *International Journal of Production Economics* (six), *Journal of Business Research* (five) *and The International Journal of Logistics Management* (five). There are 56 other journals in which this topic has appeared, reflecting that the topic spans boundaries and encompasses different streams of research.

Figure 2 Paper distribution over time

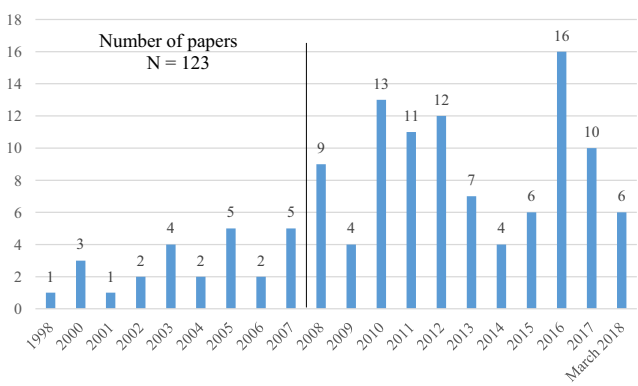


Figure 3 Distribution of reviewed papers by journal

Regarding the methodologies adopted, the empirical research (including both quantitative secondary data analysis and survey) is the most commonly used method, accounting for 66.7 per cent of all papers. The second commonly used method is the case study, which accounts for 19.5 per cent. Conceptual model development papers (13.8 per cent) rank third. We excluded most of the mathematical modelling and simulation papers, which provide little theoretical insights into the empirical/conceptual model of SCL, which we attempt to build.

Regarding the theoretical perspectives of the reviewed papers shown in Table I, it is important to note that most papers did not explicitly specify a theory underpinning their research. Among those that did, the resource-based view (RBV), transactional cost economics (TCE), the knowledge-based view (KBV), relational view (RV) and the organizational learning theory (OLT) were the most commonly used theories.

Table I Distribution of underlying theories

Theory	Papers
Not specified	60
Specified	63
Resource-based view	25
Transactional cost economics	18
Knowledge-based view	16
Relational view	10
Organizational learning theory	6
Resource dependence theory	5
Contingency theory	4
Relational exchange theory	4
Social exchange theory	3
Stakeholder theory	3
Dynamic capabilities theory	2
Institutional theory	2
Social network theory	2
Activity theory	1
Agency theory	1
Complexity theory	1
Evolutionary theory	1
Organizational dependence view	1
Power-dependence theory	1

Note: Some papers combine more than one theory

3. Thematic analysis

3.1 Conceptual development of SCL

Over the past decade, learning has been a key concept discussed by many authors. Accordingly, we have reviewed the literature to see the evolution of the SCL concept by comparing its various definitions. Learning may be studied at different levels of analysis, and Knoppen *et al.* (2010) summarized the levels of learners as individual, group, organization, dyad and network. They argued that organizational learning (OL) is more than the sum of individual learning (Knoppen *et al.*, 2010). According to Francis (1997), OL is the sum of individual and collective learning and individuals are the agents of OL (Verwaal *et al.*, 2008); in other words, organizations learn through their individual employees (Azadegan *et al.*, 2008). Research related to OL is said to have developed in the 1960s (Cyert and March, 1963). Fiol and Lyles (1985) defined OL as the development of insights, knowledge and association between past actions, the effectiveness of those actions and future actions. It encompasses the creation, adaptation, replication and accumulation of knowledge (Dyer and Shafer, 1999; March, 1991). Two prominent themes – intra-organizational and inter-organizational learning – characterize the OL literature (Holmqvist, 2003). Intra-organizational learning indicates learning within organizations and requires the identification of information needs, the acquisition of information externally and the internal dissemination of information (Day, 1994). Research on OL has principally focused on either the individual or the intra-organizational level (Gosling *et al.*, 2016).

Inter-organizational learning has received significant attention in recent years (Coghlan and Coughlan, 2015). It refers to learning that occurs beyond the boundaries of individual organizations (Theodorakopoulos *et al.*, 2005), at an inter-organizational level. Inter-organizational learning has been addressed under a variety of headings, including "inter-firm learning", "inter-partner or alliance learning", "cross-border learning" and "relationship learning" (Jia and Lamming, 2013). These terms all focus on one buyer and one supplier, and they can be called "dyadic learning" (Jia and Lamming, 2013).

SCM is crucial in a highly competitive global business environment and has become an important research topic in the business literature (Silvestre, 2015). The competitive performance of SCs depends both on learning and on the development of the entire system (Bessant *et al.*, 2003). Therefore, it is important to consider learning in a SC context because it has a substantial impact on the types of interactions that are taking place between organizations (Thakkar *et al.*, 2011). An emerging theme of learning in SCs is labelled SCL (Bessant and Francis, 1999). SCL derives and is extended from inter-organizational learning (Bessant *et al.*, 2003; Flint *et al.*, 2005). Because the dynamics of SC relationships and the effects of knowledge transfers are characterized by a high degree of complexity, SCL is a difficult phenomenon to investigate in depth (Toni *et al.*, 2011; Biotto *et al.*, 2012). Therefore, existing literature on SCL remains scarce, and more research efforts are needed (Willis *et al.*, 2016; Flint *et al.*, 2008). Flint *et al.* (2008) distinguished between SCL and inter-organizational learning in that the latter is broader and can be limited to two partner organizations. To be comprehensive, in this study, we review papers on both SCL and dyadic learning because the dyadic relationship is a fundamental building block of the SC (Harland, 1996).

We find 21 papers in the sample that explicitly adopt the term "supply chain learning" for an in-depth analysis shown in Table II. We can see that the research on SCL mainly focuses on three aspects. First, most studies usually combine SCL with other constructs to explore their relationships (e.g. SCL and innovation). Second, the papers that focus on the process of SCL often adopt case study method or build a conceptual framework. Third, some research pay attention to the application of SCL in some specific context, such as third-party logistics and vendor managed inventory.

Table III shows the different definitions of SCL presented in the 21 papers. Comparing these definitions, we find they may be grouped into four types, that is, process orientation, structure orientation, consequence orientation and other informal definitions. The process view of learning refers to the development process of new knowledge that has the potential to change firm's behavior (Huber, 1991). The structure view focus on how SCL takes place and what it consists of, that is, the dimensions. The consequence orientation concentrates on the ultimate objectives of SCL, such as improving performance and enhancing competitive advantage. The remaining studies adopt the existing definitions or provide some informal definitions, that is, descriptions of some SCF features.

There are different categorizations of SCL commonly discussed in the existing literature. One is proposed by Spekman *et al.* (2002) that clarified SCL as learning enablers and learning structures/systems/processes. Sambasivan *et al.* (2009) and Loke *et al.* (2012) adopted this categorization. Zhang and Lv (2015) divided SCL into learning from suppliers and learning from customers. The third category borrows from organizational learning research and measures SCL based on team orientation, system orientation, learning orientation and memory orientation (Thakkar *et al.*, 2011; Ojha *et al.*, 2016; Ojha *et al.*, 2018). Finally, inspired by Van Hoof (2014), Gosling *et al.* (2016) proposed three types of SCL that are single-loop learning, single-loop learning plus and double-loop learning.

3.2 Drivers and sources of SCL

According to the previous literature on the combination of SC and learning, numerous factors contribute to learning in the SC. In this paper, we adopt the categorization of antecedents provided by Tachizawa and Thomsen (2005) to explore the drivers (reasons or motivation of why SCL is needed) and the sources (how SCL is achieved), which have rarely been studied simultaneously before. We present them separately in Tables IV and V according to the reviewed papers.

Most of the factors we identified involve the context of buyer–supplier relationships; however, only a few studies examine the factors that influence SCL. For example, Spekman *et al.* (2002) explored six pre-conditions for SCL to emerge: trust, communication, the type of relationship, decision-making style, culture and win-win orientation. These pre-conditions to SCL are further confirmed by Sambasivan *et al.* (2009). Bessant *et al.* (2003) drew on a study of six SCs at various stages of implementing SCL and summarize specific

Table II Papers explicitly using SCL term

Study	Approach	Theoretical lens	Topic
Combine SCL with other constructs			
Spekman *et al.* (2002)	Conceptual	None	Exploring the pre-conditions for learning to emerge and the impact of learning on SC performance
Flint *et al.* (2008)	Survey	None	Exploring the relationship among capturing customer insights, SCL, innovation and organizational performance
Sambasivan *et al.* (2009)	Survey	Contingency theory	Testing the relationship between applied supply-chain-process-knowledge, SCL and organization performance
Ngai *et al.* (2011)	Case study	Resource-based view	Exploring the impact of the relationship between supply chain competence and supply chain agility on firm performance
Loke *et al.* (2012)	Survey	None	Integrating total quality management and knowledge management into a unified framework to study SCL among partnering firms
Golgeci and Arslan (2014)	Conceptual	Dynamic capabilities theory, institutional theory	Analyzing the relationships between marketing and SCL capabilities and institutional pressures
Zhang and Lv (2015)	Survey	None	Analyzing the influence of intellectual capital on firms' technological innovation and the intermediary effect of SCL in the relationship between different dimensions of intellectual capital and technological innovation
Ojha *et al.*, 2016	Survey	Resource-based view	Exploring the relationship among trust, SCL, entrepreneurial emphasis and innovativeness
Willis *et al.*, 2016	Survey	Knowledge-based view	Exploring the relationship among SCL, integration and flexibility performance
Gosling *et al.* (2016)	Conceptual	None	This paper proposes a conceptual framework on how do Multi-national Corporations assume leadership in how their SCs learn and adopt sustainability practices
Ojha *et al.*, (2018)	Survey	None	This paper examines the impact of top management transformational leadership on SCL and SC ambidexterity
Zhu *et al.* (2018)	Survey	Transition cost economics, knowledge-based view	This paper is to demonstrate how SCL and imitation prevention mediates the relationships between SC integration and focal firm performance
The process of SCL			
Bessant *et al.* (2003)	Case study	None	A detailed study of six UK SCs at various stages of implementing SCL
Thakkar *et al.* (2011)	Conceptual	None	Mapping framework for evaluating SCL potential for the context of small- to medium-sized enterprises
Lambrechts *et al.* (2012)	Conceptual	None	Building a conceptual framework for understanding how in-depth joint supply chain learning can be successfully developed
Silvestre (2015)	Case study	Institutional theory, evolutionary theory, complexity theory	Enhancing our understanding of how sustainability can be incorporated and managed within SCs in emerging economies
Gong *et al.* (2018)	Case study	Resource orchestration perspective	This paper is to explore how multinational corporations (MNCs) orchestrate internal and external resources to help their multi-tier supply chains learn sustainability-related knowledge
The application of SCL			
Theodorakopoulos *et al.* (2005)	Conceptual	Organizational learning theory	This paper reports on an innovative UK-based SCL initiative to encourage the corporate sector to consider supplier diversity in respect of ethnic minority businesses
Sweeney *et al.* (2005)	Case study	None	This paper describes the case of a learning program with specific reference to its use in addressing some of current shortcomings related to SC knowledge and skills in the Irish third-party logistics industry
Yao *et al.* (2012)	Model	None	Examining the learning curves through which performance improvements are realized under vendor managed inventory
Biotto *et al.* (2012)	Case study	None	This paper explores and explains how an enterprise can compete and win in the international market by integrating quality management practices along its SC and becoming the coordinator in a SCL network

enablers of and obstacles to the development of SCL, for example, production staff visiting the shop floor of customers and suppliers, helping suppliers "see the benefits of SCL all the time" and the adoption of a structured and organized approach to the participating companies.

Flint *et al.* (2008) further argued that the greater the cross-functional discussions about customers (the degree to which organizations engage in cross-functional dialogue about customer value insights), the greater is the extent of SCL management. Loke *et al.* (2012) found that total quality

Table III Definitions of SCL

Study	SCL definition
Process orientation	
Flint *et al.* (2008)	Multiple organizations developing, sharing and collaborating about supply chain and product problems and potential solutions jointly across organizations within a supply chain
Lambrechts *et al.* (2012)	Building the capacity to create new knowledge and possibilities together through a process where actors can learn collectively how to rethink and renew their supply chain frame
Golgeci and Arslan (2014)	SCL focuses on processes of learning along the supply chain: a type of inter-organizational learning
Gosling *et al.* (2016)	Supply chain learning derives from inter-organizational leaning, which addresses how organizational members act jointly to create collective knowledge
Structure orientation	
Bessant *et al.* (2003)	Supply chain learning is learning behaviors in an inter-organizational context
Theodorakopoulos *et al.* (2005)	Supply chain learning refers to inter-organizational learning, taking place in and between supplying and purchasing organizations
Ojha *et al.*, 2016	Supply chain learning is a resource characterized by the degree to which all supply chain partners stress four key learning routines across the supply chain organization – team orientation, system orientation, learning orientation and memory orientation
Ojha *et al.* (2018)	Supply chain learning involves learning new processes and techniques to accomplish tasks. It occurs when all the partners in a supply chain emphasize the four dimensions of organizational learning – learning orientation, systems orientations, team orientations and memory orientations
Consequence orientation	
Sweeney (2005)	Supply chain learning are based on the willingness to encourage organizational integration, the search for new solutions and, in general, the decisive change for improving performance and process efficiency
Ngai *et al.* (2011)	Development of new knowledge or insights and using knowledge that has the potential to influence supply chain capability and enhance competitive advantage
Biotto *et al.* (2012)	Learning is an intangible strategic resource, a competence and a bonding element deeply embedded in the supply relationships that drive supply management success, and can create a competitive advantage
Silvestre (2015)	Supply chains learn new capabilities that allow them to jointly develop technological, organizational and business model innovations that move them towards enhanced integration, collaboration and sustainability performance
Zhang and Lv (2015)	The concept of supply chain learning is rooted in organizational learning and indicates that as a whole, an organization's staff continually acquires knowledge, perfecting their behavior and optimizing the organizational system to maintain the organization's capability of sustainable survival, as well as healthy and harmonious development in varying internal and external environments
Other informal definitions	
Spekman *et al.* (2002)	Learning is predicated on acquiring new insight/knowledge that improves the firm's outcome. A process for learning needed to become an integrated aspect of "business as usual" within an integrated supply chain
Sambasivan *et al.* (2009)	Proxies for knowledge acquisition
Thakkar *et al.* (2011)	In the context of supply chain, the perspective of learning carries great impact on the kind of interactions that are taking place between organizations
Yao *et al.* (2012)	The implementation of VMI involves not only coordination among multiple departments within an organization but also coordination between firms in the supply chain. The complexities involved with implementation imply that there may be a learning process associated with VMI
Loke *et al.* (2012)	The same as Sambasivan *et al.* (2009)
Willis *et al.*, 2016	The same as Flint *et al.* (2008)
Zhu *et al.* (2018)	The same as Flint *et al.* (2008)
Gong *et al.* (2018)	The same as Flint *et al.* (2008)

management and knowledge management practices have a significantly positive impact on SCL. This is because firms that are committed to quality management are more inclined to devote resources that support learning activities, and SC partners are more prone to sharing information. Lambrechts *et al.* (2012) found that the leading facilitative actor's orientations, competencies and behavior play a significant role in enhancing the relationships between SC actors, thereby shaping in-depth joint learning. Gosling *et al.* (2016) proposed a conceptual model of the role of SC leadership in the learning of sustainable practice and propose that transactional SC leadership and transformational SC leadership affect the relationship between sustainable supply chain management (SSCM) governance and SCL. Ojha *et al.* (2016) demonstrated that there is a positive association between trust and SCL. Trust may serve as the relational lubricant (Ireland and Webb, 2007) that encourages SC organizations to transfer knowledge, engage in joint learning, collaborate and share revenue (Ojha *et al.*, 2016).

Table IV SCL Drivers and references

No.	Drivers	Details	References
1	*Intra-organizational drivers*		
1.1	High learning intent	The intention to internalize knowledge or skill learned from SC partners	Emden *et al.* (2005), Liu and Zhang (2014), Liu (2012), Yoo *et al.* (2016), Huang and Chu (2010)
1.2	High innovation orientation	Innovation orientation is viewed as an organizational culture that facilitates a learning atmosphere, which would have a positive attitude toward participating in SCL activities, such as building joint problem-solving teams	Jean *et al.* (2010), Jean and Sinkovics (2010)
1.3	Openness culture	A culture supportive of trusting behavior, openness, inquiry and experimentation would drive SCL	Spekman *et al.* (2002), Sambasivan *et al.* (2009)
1.4	Top management support	It creates a mindset that facilitates the orientation for integration and collaboration among SC partners to encourage SCL	Manuj *et al.* (2013), Ojha *et al.* (2018)
1.5	Great internal complexity	It reflects the difficulty of matching two operations across organizational boundaries. The greater the internal complexity, the more likely it is that complex information must be shared	Selnes and Sallis (2003)
1.6	Import	Imports provide an opportunity for learning in the process of SC management, as well as in the process of internationalization	Grosse and Fonseca (2012)
2	*Inter-organizational drivers*		
2.1	High win-win orientation	The existence of a win-win orientation decreases the tension between the partners and encourages the learning process	Spekman *et al.* (2002), Sambasivan *et al.* (2009)
2.2	Culture difference	The existence of culture difference forces the partners to dedicate more time to communication, establishing compatible cooperation routines and developing an approximate set of common directives, as a result, they obtain a better level of learning	Benavides-Espinosa and Roig-Dobon (2011), Liu and Zhang (2014)
2.3	High partner fit (complementarity and compatibility)	Complementarity refers to the lack of similarity or overlap between core businesses or capabilities, and is the extent to which each partner brings unique strengths and resources of value to the exchange. Compatibility is the congruence in organizational cultures and capabilities between partners that influences the extent to which partners are able to realize the synergistic potential of a relationship	Cheung *et al.* (2010), Shakeri and Radfar (2017)
2.4	Resolved conflicts	As conflicts arise, partners will have to determine how to resolve them appropriately which, in turn, will continually develop their ability to build a relationship with the other partners and their ability to cooperative learning	Benavides-Espiriosa and Ribeiro-Soriano (2014), Shakeri and Radfar (2017)
2.5	Technological distance	Alliances between technologically distant firms provide access to novel knowledge, and gain access to distinct capabilities, which encourages learning and innovation	Subramanian *et al.* (2018)
2.6	Intergroup/Alliance structure (high task interdependence and colocation)	An interdependent task structure results in joint actions, trust and fine-grained information transfer, which creates a fertile environment for SCL. Colocation allows buyer–supplier interactions to happen beyond normal project hours, that is, during breaks when people are more relaxed. Accordingly, creative solutions are more likely to be found in an efficient fashion and learning is more likely to occur	Yan and Nair (2016)
2.7	High alliance creativity	Alliance creativity promotes the exploration of ideas to develop new solutions and thereby promotes learning	Bucic and Ngo (2013)
2.8	Mutual influence	Partners' mutual influence on each other in the alliance encourages them to engage in democratic and participative processes and thus facilitates learning and knowledge transfer between alliance partners	Muthusamy and White (2005)
2.9	High-status partners	High-status partners, driven by status anxiety, are likely to offer firms certain support including essential knowledge and skills, so that they can reduce the likelihood of being jeopardized by those affiliates	Yu and Sharma (2016)
2.10	Active network context	It increases the likelihood of accessing useful knowledge and creating new knowledge through the recombination of existing ones	Rebolledo and Nollet (2011)
2.11	Contracting	The process of drafting or re-writing contracts fosters learning about each other's needs, intentions and expectations. During contract execution, new information is generated that further enables parties to learn how more effectively to (re)design contracts by adjusting the level of contractual detail	Selviaridis and Spring (2018)
3	*High environmental uncertainty*	Under high environmental uncertainty, companies might be motivated to engage in relationship learning either to gain some control over externalities or to buffer the consequences	Cheung *et al.* (2010), Selnes and Sallis (2003)

Table V SCL Sources and references

No.	Sources	Details	References
1	***Intra-organizational sources***		
1.1	A firm's capability (e.g., absorptive capacity, information acquisition capability)	Absorptive capacity influences the level of learning and without it firms will simply have no ability to exploit external knowledge. Information acquisition capability can have better potential of benefiting from their SC partners as information agents, which is also a valuable enabler to promote SCL	Jean *et al.* (2012), Bucic and Ngo (2013), Liu and Zhang (2014), Liu (2012), Lane and Lubatkin (1998), Golgeci and Arslan (2014)
1.2	IT advancement	IT can enhance the quality and quantity of information exchange among SC partners, and thus lead to a greater degree of SCL	Jean *et al.* (2010), Scott (2000), Rebolledo and Nollet (2011)
1.3	A firm's intellectual capital and social capital	The higher the staff quality, the more knowledge can be acquired and the more significant the promotion of SCL. The staff who frequently communicate with outside partners usually enjoy more opportunities to make contact with various resources, which promote SCL	Zhang and Lv (2015), Ado *et al.* (2017), Shakeri and Radfar (2017)
1.4	Customer insight, market orientation (supplier and customer)	Extensive cross functional discussions about customers and how their demands are changing are likely to lead to the management of learning processes. Market orientation provides the cultural foundation for SCL	Flint *et al.* (2008), Lai *et al.* (2009)
1.5	Total quality management practices	Firms that are committed to quality management are more inclined to devote resources in technology and information systems that support the learning activities	Loke *et al.* (2012)
2	***Inter-organizational sources***		
2.1	Trust	Mutual trust can reduce opportunism and contribute to a greater exchange of information	Spekman *et al.* (2002), Mellat-Parast and Digman (2008), Cheung *et al.* (2010), Jean *et al.* (2010), Rebolledo and Nollet (2011), Manuj *et al.* (2013), Ojha *et al.* (2016), Anderson *et al.* (2011), Benavides-Espiriosa and Ribeiro-Soriano (2014), Liu and Zhang (2014), Muthusamy and White (2005), Sengun (2010), Sengun and Onder (2011), Revilla and Knoppen (2015), Shakeri and Radfar (2017), Yang and Lai (2012), Back and Kohtamaki (2016)
2.2	Relationship (e.g., the type of relationship, relationship-specific assets, relationalism, the length of relationship, relationship capital, relational practices, joint activities)	For example, the type of relationship, when relationships are more informal, the opportunity for more frequent and deeper/tacit knowledge transfer	Spekman *et al.* (2002), Sweeney *et al.* (2005), Hernandez-Espallardo *et al.* (2010), Rebolledo and Nollet (2011), Huikkola *et al.* (2013), Golgeci and Arslan (2014), Agarwal and Selen (2009), Eiriz *et al.* (2017), Lin *et al.* (2017), Jean *et al.* (2017), Chang and Gotcher (2007), Zhao and Wang (2011)
2.3	Partner/Alliance commitment	A high level of commitment reduces the opportunism risk and generates an ability to cooperate that enables SCL to be developed through trial and error	Spekman *et al.* (2002), Sambasivan *et al.* (2009), Wittstruck and Teuteberg (2012), Manuj *et al.* (2013), Anderson *et al.* (2011), Benavides-Espiriosa and Ribeiro-Soriano (2014), Emden *et al.* (2005), Muthusamy and White (2005), Selnes and Sallis (2003), Li (2006)
2.4	Collaboration, Cooperation, Integration	Collaboration is an idea platform for learning, because it can create a continuous learning process through knowledge exchange	Hernandez-Espallardo *et al.* (2011), Oelze *et al.* (2016), Sambasivan *et al.* (2009), Bouncken and Fredrich (2016), Scott (2000), Tse *et al.* (2016)
2.5	Supplier management	Learning opportunities would exist in the context of a supplier development and business improvement environment	Williams (2007), Giannakis (2008), Ehrgott *et al.* (2013), Ehrgott *et al.* (2011)
2.6	Alliance function, the role of hub firm	Alliance function can coordinate tasks, which would promote more developed processes to learn and accumulate alliance management know-how	Kale and Singh (2007), Silvestre (2015), Gibb *et al.* (2017), Gong *et al.* (2018)

(***continued***)

Table V

No.	Sources	Details	References
		The role the hub firm plays in regulating network learning processes	
2.7	SC governance	It can safeguard the risk of opportunism, and it is concerned with the management of resources in a SC to create relational rents therefor promoting knowledge transfer and learning	Hernandez-Espallardo *et al.* (2010), Gosling *et al.* (2016), Yeh (2016), Ling-Yee (2007)
2.8	Knowledge/Information sharing	If companies exchange information with their SC partners, all companies within a network benefit more strongly from it, and learning effects are noticeably higher	Mikkola (2003), Wittstruck and Teuteberg (2012)
2.9	Communication	The frequency, depth, and content of communications between SC members would impact on knowledge transfer and SCL	Spekman *et al.* (2002), Sambasivan *et al.* (2009)
2.10	Joint decision-making	Joint decision-making by the SC partners strengthens the learning process through highly interactive exchanges and knowledge transfers	Spekman *et al.* (2002), Sambasivan *et al.* (2009)
2.11	Knowledge openness	It indicates the willingness of partners to open their knowledge for others to access, which would promote SCL	Liu and Zhang (2014)
2.12	Learning behaviors (informal and formal)	Informal learning behaviors (in the form of spontaneous interaction and knowledge sharing) are essential in transfer tacit knowledge Formal learning behaviors (in the form of programmed events and visits) have a positive impact on knowledge sharing between organizations	Janowicz-Panjaitan and Noorderhaven (2008)

3.3 Barriers of SCL

Few studies analyze the barriers to SCL. Bessant and Tsekouras (2001) and Morris *et al.* (2006) summarized some key blocks to learning (Table VI), such as a lack of entry to the learning cycle, an incomplete learning cycle, weak links in the cycle, a lack of learning skills or structure, the maintenance of knowledge in tacit form, repeated learning, infrequent learning, sporadic learning and learning that is not sustained.

A case study of six SCs conducted by Bessant *et al.* (2003) found some blocks to SCL, for example, the lack of a systematic overview of the problems of SCL, the lack of appropriate skills, time constraints, the lack of processes to record the lessons obtained through SCL, the protection of one's own corner instead of looking for the bigger picture and the failure to work with competitors. Williams (2007) also concluded that there are three obstacles to learning: structure, accountability and espoused theory. Rebolledo and Nollet (2011) pointed out that distance, which involves both a geographical and a cultural dimension, is negatively associated with inter-firm learning. Because transferring tacit knowledge requires direct contact at the individual level (Grant, 1996), geographical distance discourages personal contact, which is an obstacle to knowledge transfer in strategic alliances (Simonin, 1999). In addition, cultural distance creates a need to take more time to communicate with partners, which is a challenge for interface managers. In developing and emerging economies, business environments present a higher degree of uncertainty and complexity (Knight and Hyneman, 1921). A full list of barriers is summarized in Table VII.

3.4 Outcomes of SCL

Learning in a SC context produces many positive outcomes. Hult *et al.* (2003) proposed that organizational learning may be seen as a strategic resource and summarize 10 theoretically based consequences of knowledge management, supply management, general management and performance. First, learning is predicted to have an effect on knowledge management (information acquisition, knowledge distribution, information interpretation and organizational memory) (Huber, 1991) as a culture-based phenomenon; second, the two supply chain management consequences consist of relationship commitment and customer orientation; third, based on research by Slater and Narver (1995), general management consequences involve both innovativeness and entrepreneurship. Finally, performance consequences include both cycle time and overall performance. Inspired by Hult *et al.* (2003), we collect a set of SCL outcomes from the reviewed papers, which can be summarized into two categories (Table VIII). One is SC capabilities, including innovation capability, relationship development capability and capabilities of collaboration, integration, agility and process improvements. The other is sustainable SC performance, which includes economic, environmental and social performance.

4. Discussion

In this section, we aim to develop an integrated theoretical framework of SCL that integrates the themes identified from the literature review.

4.1 Assessment of theories used in SCL

It is found that RBV, TCE, KBV, RV and OLT were the most commonly used theories (Table I). Building on the RBV, firms can gain superior performance and competitive advantages by developing and deploying unique and idiosyncratic organizational resources and capabilities (Wernerfelt, 1984; Barney, 1991). Some research suggests that learning serves as a strategic resource within SC organizations (Gonzalez-Padron *et al.*, 2008; Willis *et al.*, 2016), whereas others regard learning as a capability that enables other capabilities to develop

Table VI Key blocks to learning

No.	Learning block	Underlying problem
1	Lack of entry to the learning cycle	Perceived stimulus for change is too weak Firm is isolated or insulated from stimulus Stimulus is misinterpreted or underrated Denial
2	Incomplete learning cycle	Motivation to learn is present but process of learning is flawed. Emphasis given to some aspects – e.g. experimentation – but not to all stages and to sequence
3	Weak links in the cycle	Reflection process is unstructured or unchallenging Lack of access to or awareness of relevant new concepts Risk avoidance leads to lack of experimentation Lack of sharing or exchange of relevant experiences – parochial search for new ideas "Not invented here" effect
4	Lack of learning skills or structure	Lack of supporting and enabling structures and procedures
5	Knowledge remains in tacit form	Lack of mechanisms for capturing and codifying learning
6	Repeated learning	Lack of mechanisms for capturing and codifying learning leads to repetition of same learning content
7	Learning is infrequent, sporadic and not sustained	Mechanisms for enabling learning are not embedded or absent

Source: Based on Bessant and Tsekouras (2001) and Morris *et al.* (2006)

Table VII Barriers of SCL

Barriers	Details
Inter-organizational barriers	Distance (geographical, culture, language, legal) Low levels of trust Lack of supporting and enabling structures and procedures The inconsistent pace with suppliers Failure to work with competitors Partner control Administrative structure (formalization and centralization)
People barriers	Lack of motivation Inadequate knowledge and lack of right skills Arrogance of some managers Failure to see the problem and joint benefits
Objective barriers	Time constraint Money shortage Lack of available technology

(Panayides and So, 2005; Yazdanparast *et al.*, 2010). For example, Jean and Sinkovics (2010) drew on the RBV to propose that applied technological innovation as a resource enhances relationship learning capability, which in turn influences supplier innovativeness and relationship performance in international supplier–customer relationships.

The KBV is an extension or sub-category of the RBV and recognizes that knowledge is a critical resource, which is usually both difficult to imitate and socially complex (Grant, 1996). Heterogeneous knowledge bases and capabilities among firms are the major determinants of sustained competitive advantage and superior corporate performance (Willis *et al.*, 2016). Knowledge can be divided into two types: explicit and tacit. Explicit knowledge refers to knowledge that is transmittable in formal and systematic language (Nonaka, 1994). Tacit knowledge has a personal quality, which makes it difficult to formalize and communicate (Nonaka, 1994). In SCs, learning is the ability to share benefits and risks by integrating and utilizing not only explicit knowledge but also tacit knowledge (Dyer and Singh, 1998; Jap, 2013).

The core tenet of the OLT is that firms with greater learning capability can sustain a competitive advantage at least in the short and medium term (Argote, 2005), and therefore, learning capability is a critical success factor (Richey and Autry, 2009). According to the OLT, both explorative learning and exploitative learning are important and can help firms gain and sustain a competitive advantage (March, 1991; Levinthal and March, 1993). Explorative learning focuses on the discovery of the new principles, whereas exploitative learning focuses on the application of existing principles (Lee *et al.*, 2013). For example, Azadegan *et al.* (2008) used the OLT to develop a conceptual model of learning factors that act as contingencies and magnify the effect of supplier innovativeness on manufacturer performance. They also argue that one way to deal with learning traps (the main risk to successful knowledge transfer) is to select suppliers with complementary rather than supplementary learning styles. Exploration by a supplier can reduce the entrapments involved in overusing exploitation, whereas external exploitation can minimize the effects of excessive exploration (Azadegan *et al.*, 2008).

Both the KBV and the OLT focus on opportunity creation and growth, whereas the TCE focuses on cost minimization (Richey and Autry, 2009) and stipulates that both learning and the exchange of knowledge have strong negative aspects, for example, opportunistic behavior resulting in asymmetric learning (Kale *et al.*, 2000) and learning races. TCE can be used to concentrate on control opportunistic behaviors when specific investments are involved (Hernandez-Espallardo *et al.*, 2010).

Although the theories mentioned above can explain competitive advantage in several contexts, one of their limitations is that they focus on the firm while ignoring that an individual firm's performance often depends on the resources, capabilities and performance of other firms and interaction between firms in the SC (Manuj *et al.*, 2013). For this reason, some research draws upon the RV to explain the buyer–supplier relationships in the SC.

Table VIII Outcomes of SCL

No.	Outcomes	Details	References
SC capabilities			
1	*Innovation capability*		
1.1	Innovation Performance		Flint *et al.* (2008), Silvestre (2015), Anderson *et al.* (2011), Bucic and Ngo (2013), Fang *et al.* (2011), Revilla and Knoppen (2015), Knoppen *et al.* (2015), Kahkonen *et al.* (2017), Yazdanparast *et al.* (2010), Jean *et al.* (2017), Chen *et al.* (2017), Albort-Morant *et al.* (2018), Chen *et al.* (2009), Back and Kohtamaki (2016), Song and Wang (2010)
1.2	Product & Process innovation		Maqsood *et al.* (2007), Fu *et al.* (2013), Manuj *et al.* (2013), Bouncken *et al.* (2016)
1.3	Supplier innovation		Jean and Sinkovics (2010), Jean *et al.* (2012), Jean *et al.* (2016)
1.4	Exploitation- and exploration-based innovations		Hernandez-Espallardo *et al.* (2011)
1.5	Entrepreneurial innovation		Ojha *et al.* (2016)
1.6	Collaborative innovative capacity		Agarwal and Selen (2009)
2	*Relationship development*		
2.1	Relationship performance		Ratten (2004), Jean and Sinkovics (2010), Mellat-Parast (2013), Emden *et al.* (2005), Fang *et al.* (2011), Liu (2012), Selnes and Sallis (2003), Selviaridis and Spring (2018), Ling-Yee (2007), Li (2006), Lai *et al.* (2009), Zhao and Wang (2011), Cheung *et al.* (2011)
2.2	Customer aspects	Customer orientation, Customer capital, Buyer satisfaction, Buyer's dependence on its suppliers, Customer engagement	Hult *et al.* (2000), Mellat-Parast (2013), Bouncken *et al.* (2015), Kahkonen *et al.* (2015), Leal-Millan *et al.* (2016), Cai *et al.* (2010), Agarwal and Selen (2009), Lin *et al.* (2017)
2.3	Relationship value	Relationship value and quality, Relationship improvement	Cheung *et al.* (2010), Yang *et al.* (2016), Preiss and Murray (2005), Yeh (2016)
2.4	Relational knowledge stores	It includes interactive knowledge stores, functional knowledge stores, environmental knowledge stores, and interpersonal knowledge stores	Yang and Lai (2012)
3	*Capabilities of collaboration, integration, agility and process improvements*		
3.1	Collaboration, Integration, Agility		Ngai *et al.* (2011), Willis *et al.* (2016), Defee and Fugate (2010), Liu (2012), Tse *et al.* (2016)
3.2	Process improvement	Effective process implementation, Applied SCM process knowledge, Intensity of electronic business adoption, Proficiency of new product development process	Huang *et al.* (2008), Mellat-Parast and Digman (2008), Sambasivan *et al.* (2009), Huang and Chu (2010)
3.3	Degree of internationalization		Golgeci and Arslan (2014)
Sustainable SC performance			
1	*Economic consequences*	Market performance, Financial performance, Operational performance (e.g. Product quality, Cycle time, Product architecture designs)), Continuous improvement, Value creation, Supply network success	Spekman *et al.* (2002), Mikkola (2003), Jean *et al.* (2010), Song and Chatterjee (2010), Hernandez-Espallardo *et al.* (2010), Mason *et al.* (2012),Yao *et al.* (2012), Yang (2016), Emden *et al.* (2005), Jiang and Li (2008), Kale and Singh (2007), Yu and Sharma (2016), Revilla and Knoppen (2015), Shakeri and Radfar (2017), Manley and Chen (2017), Pérez-Nordtvedt *et al.* (2015)
2	*Environmental, social performance*	SSCM Success, Responsible SCM, Green Innovation Performance, SSCM performance	Wittstruck and Teuteberg (2012), Oelze *et al.* (2016), Leal-Millan *et al.* (2016), Gosling *et al.* (2016)

4.2 Extended resource-based view

Building on the RBV and the RV, recent studies criticize the internal focus of the RBV and the KBV and emphasize that some resources may lie beyond the boundary of the firm: competitive advantage is derived from both internal and external assets. This theory is known as the extended resource-based view (ERBV) (Lavie, 2006; Lewis *et al.*, 2010). Internal and external capabilities are equally important to a firm's performance (Das and Teng, 2000; Mathews, 2003; Araujo *et al.*, 1999; Jia and Lamming, 2013). The ERBV can explain

the gaining of competitive advantage in a more integrated manner (Son *et al.*, 2014), emphasizing the network aspect of interconnected firms by conceptualizing how firms can reinforce their competitive advantage in inter-organizational settings (Lavie, 2006; Son *et al.*, 2014). Thus, the unit of analysis changes from the RBV's focus on the firm to the ERBV's focus on the dyadic or network levels (Squire *et al.*, 2009). Some research has applied the ERBV. Arya and Lin (2007) provided empirical support for the logic of the theory, with results indicating that organizations can enhance their capabilities and enjoy higher monetary and non-monetary rewards by collaborating with others. Squire *et al.* (2009) adopted the theory to certify that there is a strong relationship between suppliers' capabilities, SC collaboration and buyer performance. Lai *et al.* (2012) conducted an empirical test and showed that internal integration plays a strategic role in building customer and supplier integration and affects mass customization capability, which is consistent with the theory. Xu *et al.* (2014) built a model linking intra-organizational resources – inter-organizational capabilities – and competitive advantage based on the ERBV.

Jia and Lamming (2013) were the first to ground inter-firm or dyadic learning adopting the ERBV perspective and redeveloping the concept by linking it to relational rents as mutual benefits. To develop the integrated conceptual model, the ERBV is adopted to explain learning in SCs, going beyond the focus on a single firm.

4.3 The conceptual framework

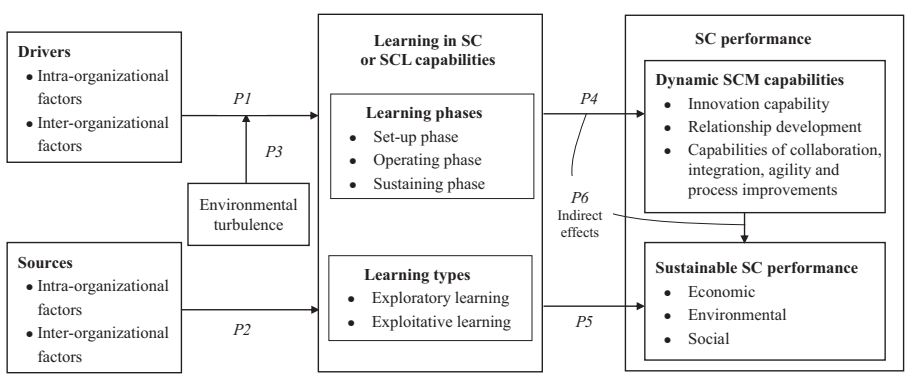
Building on the ERBV, Flint *et al.*'s definition on SCL (2008) and Im and Rai's (2008) and Kristal *et al.*'s (2010) definition of exploratory and exploitative learning and differing from the existing SCL definitions (process, structure, consequence and informal), this research defines SCL as *the exploitative* (*leverage current firm's capabilities by improving existing SC competencies processes and technologies*) *and exploratory* (*develop new SC competencies and useable external knowledge through complex searching, experimenting, and acquiring of new SC processes, resources, and technologies*) *capabilities of SC members to develop and share knowledge and solve SC problems among multiple SC members, ultimately improving other dynamic SCM capabilities and increasing sustainability of the entire SC from a dynamic capability perspective.* Adopting the ERBV perspective, we develop a set of propositions, which are shown in the conceptual model below (Figure 4). We do not consider the barriers in the framework because they are the mirrors (the opposite side) of drivers and sources. Each proposition's detailed discussions follow.

4.3.1 The relationship between drivers and SCL

A SCL driver is defined as an intra-organizational or inter-organizational characteristic that determines the level of SCL required and explore the reasons why firms need to promote SCL. Among the intra-organizational drivers, a firm's learning intent, innovation orientation and an openness culture are the most important ones. High learning intent is a key organizational value that influences a firm's propensity to generate new knowledge; however, in organizations that place little value on learning, little if any SCL is likely to occur (Emden *et al.*, 2005). This is the same for the role of innovation orientation, which refers to a firm's values in association with the generation of new ideas in the SC relationship (Hult *et al.*, 2004). It can build up a foundation for knowledge transfer and the assimilation of knowledge resources (Jean *et al.*, 2010). An openness culture that supports trusting behavior, inquiry and experimentation can encourage continuous learning and questioning behavior (Spekman *et al.*, 2002).

In terms of inter-organizational drivers, the most frequently mentioned are win-win orientation and cultural difference between SC partners. High win-win orientation captures the notion that SC partners hold the tendency to act opportunistically and work hard for the common good, which would decrease the tension between the partners and encourages the learning to take place. The literature provides two different ways of looking at the relationship between cultural difference and SCL. On the one hand, some research (Pothukuchi *et al.*, 2002; Liu, 2012) suggest that the differences and misunderstanding in culture can accelerate conflict among SC partners and minimize flows of information and learning. On the other hand, some authors hold the opposite viewpoint and point out that cultural differences have more room for negotiation and sharing ideas; therefore, they would obtain a higher level of learning (Benavides-Espinosa and Roig-Dobon, 2011; Liu and Zhang, 2014). We hold the view that due to the existence of cultural difference among SC partners, they have to rethink and adjust their routines to make the cooperation happen, that is, a driver. Other drivers of SCL can be seen in Table IV. In accordance with above discussion, we establish the following proposition:

Figure 4 The conceptual framework of SCL



P1. Intra- and inter-organizational drivers have a positive impact on SCL.

4.3.2 The relationship between sources and SCL

SCL sources indicate how firms enhance SCL and can be divided into intra- and inter-organizational levels. A firm's absorptive capacity and IT advancement are the most important sources at an intra-organizational level. Absorptive capacity refers to a firm's ability to identify, assimilate and exploit knowledge, which plays an essential role in efficient learning. It influences the level of learning and without it firms will simply have no ability to exploit external knowledge (Szulanski, 2015). IT advancement can link up with a large number of SC partners and facilitates the exchange rich information, such as collaborative planning, forecasting and replenishment, which can further facilitate joint learning activities (Jean *et al.*, 2010).

At an inter-organizational level, trust, commitment, collaboration and integration are essential to develop SCL. In terms of SC relationships, trust promotes learning because it increases familiarity between the SC partners and further influences the assumption of common norms and values, both of which are important pre-conditions to the promotion of learning in SC relationships (Hernandez-Espallardo *et al.*, 2010). Commitment in a SC can be best understood as the extent to which the firms involved actually engage with its suppliers or customers (Anderson and Weitz, 1992). A high level of commitment reduces the risk of opportunism and indicates the great efforts to solve any problems that arise during the cooperation process (Mohr and Spekman, 1994). Collaboration with SC partners is important not only to get information and knowledge from the relationship, but also to maintain the learning stream in the long run (Hernandez-Espallardo *et al.*, 2011). Furthermore, increasing relational investments or relational practices can also promote SCL. For example, the investments in relational information systems (e.g. customer relationship management systems, supplier management systems) can make virtual collaboration effective, and time investments play an important role in joint sense-making, allowing for the development of a common language that supports solution development (Huikkola *et al.*, 2013).

Table V shows the details in which other practices such as total quality management practices and taking a customer insight can also increase SCL. In line with the discussion above, we establish the following propositions:

P2. Firms can use intra- and inter-organizational sources to foster SCL.

4.3.3 The moderating effects of environmental turbulence on the relationship between the drivers and SCL

Learning is a complex and dynamic process that is complicated by an endogenously changing business environment (Levitt and March, 1988), and the external environment has an impact on the learning process (March, 1981; Levinthal and March, 1993). Some authors point out that environmental turbulence has a positive effect on relationship learning because it requires buyers and suppliers to engage in more intense levels of inter-firm learning activities to better cope with constant market changes and challenges (Selnes and Sallis, 2003; Cheung *et al.*, 2010). Therefore, the greater the dyad's environmental uncertainty is, the greater the SCL among SC partners. On the contrary, Silvestre (2015) suggested that environmental turbulence would prevent SCs from learning and innovating, because high environmental turbulence often lead to a scenario where decision-makers face extreme ambiguity when making decisions. Combing these two different arguments, another viewpoint put forward by Fiol and Lyles (1985) suggested that the external environment can either encourage or discourage learning. In addition, environmental turbulence can also be viewed as a moderator. Gonzalez-Padron *et al.* (2008) argued that the greater the technological and market turbulence in the operating environment of the purchasing process, the stronger the relationship among antecedents (teamwork and autonomy), learning orientation and outcomes (relationship quality and cycle time) is. This is because in high environmental turbulence, uncertainty of demand offers an incentive for buyers and sellers to interact effectively and create radical innovations (Roy *et al.*, 2004). Ojha *et al.* (2018) found that uncertainty in the operating environment positively moderates the relationship between transformational leadership of senior management and SCL.

Although these literature studies suggest that environmental turbulence affect SCL differently, we tend to agree with the view that environmental turbulence is not a direct driver or barrier to SCL, but rather a moderator between drivers and SCL. A highly volatile environment alone will not lead to SCL (Defee and Fugate, 2010), it still needs the drivers from intra-organization and inter-organization to take effects. Moreover, the moderating effect exhibits an inverted U-shaped curve (i.e. SCL first improves and then plateaus or declines). Learning requires both change and stability between learners and environments (Fiol and Lyles, 1985). Too much stability can make an organization dysfunctional, and too much change can make it difficult for learners to map the environment (March and Olsen, 1975). Appropriate level of environmental turbulence increases the general level of professionalism and creativity of employees to respond to new environment; furthermore, it also increase the need for an organization to recognize the role of boundary spanners to effectively facilitate information exchange across organizational boundaries and reduce inter-firm tension (Dolan *et al.*, 2003; Rangarajan *et al.*, 2004). However, under extreme environmental turbulence, decision-makers are unaware of possible future scenarios and the effects of their actions; this would hamper SCL (Silvestre, 2015). Hence, the moderating role of environment is closely associated with the degree of uncertainty faced by an organization or the SC. In other words, the slight dynamic of the environment stimulates learning and the ability to cope with market changes and challenges. However, if the environments were too complex and dynamic for the organization or SC to handle, then an overload would occur, making it more difficult for a SC to learn (Fiol and Lyles, 1985).

Based on the above argument, we thus hypothesize the following:

P3. The effects of drivers on SCL are moderated by environmental turbulence; the moderating effect exhibits an inverted U-shaped.

4.3.4 The relationship between SCL and dynamic SCM capabilities

Dynamic capability is a firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environment (Teece *et al.*, 1997). Previous studies have emphasized the vital role of learning in developing dynamic capabilities. For example, Eisenhardt and Martin (2000) stated that learning mechanisms, such as repeated practices, the codification of experience into technology and formal procedures, mistakes, and the pacing of experience are important for the development of dynamic capabilities. Similarly, Zollo and Winter (2002) proposed that the formation and evolution of dynamic capabilities within organizations would through the coevolution of three learning mechanisms: experience accumulation, knowledge articulation and knowledge codification.

The concept of dynamic capability used to be firm-centric, but an increasing number of studies have acknowledged that it can be extended to a SC context, which is embedded within the collaborative routines formed between multiple SC partners (Richey *et al.*, 2005; Defee and Fugate, 2010). Defee and Fugate (2010) explicitly defined the concept of dynamic SC capabilities as a learned pattern of cross-organizational activities that facilitate the creation of new static capabilities or the modification of existing capabilities across multiple SC members. Dynamic capabilities shared and utilized across multiple companies in a SC can lead to a more responsive, adaptive and ultimately better-performing SC (Defee and Fugate, 2010). An increasing body of literature suggests that learning is a key capability to improve other SCM capabilities. Multiple partners may jointly develop and use the learning capability to update existing capabilities or form entirely new capabilities, and learning ultimately can be used to improve superior performance (Hunt and Morgan, 1996).

First, the relationship between learning and innovation has been discussed in a variety of SC contexts (Grawe, 2009; Flint *et al.*, 2008). According to Jiménez-Jiménez and Sanz-Valle (2011), learning enables the development, acquisition, transformation and exploitation of new knowledge that enhances innovation. Learning with SC partners can be facilitated through early supplier involvement, shared market intelligence, tighter integration and the establishment of linkages for information sharing, all of which benefit from SC members' ability to innovate faster and better (Manuj *et al.*, 2013). Both exploration learning and exploitation learning are considered complementary rather than competing processes (Nissen, 2005), which contribute to innovation generation in the SC context (Jean *et al.*, 2012).

Second, studies have found that learning has a strong link to relationship development because the firms that engage in learning activities can better understand each other's needs and respond accordingly (Kalwani and Narayandas, 1995). Learning between customers and suppliers can help firms gain a better understanding about the value required by their partners, which should enhance the effectiveness and efficiency of value creation for both buyers and suppliers (Cheung *et al.*, 2010). Learning can also lead to customer orientation (Bouncken *et al.*, 2015), strengthen customer relationships and thereby influence customer capital (Leal-Millan *et al.*, 2016). Some researchers argue that cooperative learning (referring to partners' ability to share knowledge, information and resources) (Mellat-Parast and Digman, 2007; Mellat-Parast and Digman, 2008) and learning capacity (Cheng *et al.*, 2008) enhance trust, which is beneficial for building a quality relationship.

We also suggest that exploration and exploitation are both necessary in long-term relationship development (Im and Rai, 2008). Exploratory learning reduces uncertainties about markets and technological changes, increases the creative potential of the relationship and decreases the risks of lock-in with inferior technologies (Im and Rai, 2008). Exploitative learning improves the recognition of bottlenecks and new opportunities, enhances the ability to perform routine tasks and reduces coordination costs (Im and Rai, 2008).

Third, learning is a resource-intensive activity in that the more learning orientation SC partners possess, the more dynamic are the SC capabilities that occur between the partners (Defee and Fugate, 2010). Willis *et al.* (2016) built a model that a firm's SCL is positively related to its internal and external integration with major SC partners. Tse *et al.* (2016) argued that in a SC context, external learning that includes learning from upstream suppliers and downstream customers has a positive impact on SC agility. This is because external learning enables firms to keep pace with a competitive and uncertain environment, thereby influencing their responsiveness (Tse *et al.*, 2016). Schoenherr *et al.* (2015) confirmed that the desire of a firm to learn and improve its capabilities lead to a greater level of relational inter-firm collaboration. In addition, learning is also positively related to process improvement (Mellat-Parast and Digman, 2007; Mellat-Parast and Digman, 2008; Sambasivan *et al.*, 2009). Learning with suppliers and customers can incorporate partners' knowledge into product and process design and improvement, helping build a responsive SC (Huang *et al.*, 2008). Hence, learning enables effective process implementation by creating and translating knowledge into the manufacturing process.

In a sense, static capabilities are not self-sustaining over the long run, while dynamic capabilities can continuously update and improve existing capabilities or create entirely new capabilities to adapt to the environment (Teece *et al.*, 1997). SCL plays an essential role to develop such dynamic SCM capabilities. Based on the discussion above, we offer the following proposition:

P4. SCL capabilities have a positive impact on dynamic SCM capabilities.

4.3.5 The relationship between SCL and sustainable SC performance

The nature of sustainable performance, an idea that emerged in the early 1980s from scientific perspectives on the relationship between nature and society, is to meet fundamental human needs while preserving the planet Earth's life-support systems (Kates *et al.*, 2001). Previous studies have suggested that there is a positive, direct relationship between organizational learning and firm economic performance (Slater and Narver, 1995; Hult *et al.*, 2007). In the SC context, research also shows that SCL links to positive economic consequences (Jean *et al.*, 2010; Hernandez-Espallardo *et al.*, 2010). According to the KBV, knowledge is an essential resource in an organization to create

value, strategic significance and competitive advantage (Grant, 1996). Learning from other organizations in the SC is a feasible way to access to the knowledge (Dyer and Singh, 1998). Learning from upstream suppliers such as earlier supplier involvement in new product development process help improve product quality, reduce its production cost, shorten its production operation cycle, and improve the adaptation of its products to the market (Schroeder *et al.*, 2002; Tse *et al.*, 2016). Learning from downstream firms or customers can offer a firm an accurate description of the final market's current demands and dynamics, as well as helps the firm better respond to market demands regarding product development and innovation; these would facilitate the firm's market orientation and satisfy the customers' needs so as to result in better performance (Jean *et al.*, 2010; Hernandez-Espallardo *et al.*, 2010).

In addition, existing research has emphasizes that learning is an important part of responsible SCM (Oelze *et al.*, 2016; Gosling *et al.*, 2016), because it facilitates knowledge acquisition and sharing on sustainability with SC partners, which may lead to sustainable SC performance improvement through sustainable products, processes or innovation, that is, sustainable SC configuration (Klewitz and Hansen, 2014). For example, suppliers are an essential source of information about environmental alternatives in materials, components and processes (Johansson, 2002), which is necessary to make decisions on eco-design. At the same time, sharing information among SC members, including product planning, inventory levels, fill rates, forecast accuracy, sales data and on-time deliveries, can enhance the operational efficiency in reverse logistics (e.g. product tracking and speedy return material authorization) and provide great SC visibility (Vachon and Klassen, 2006; Olorunniwo and Li, 2010), which would improve sustainable SC performance.

Based on the discussion above, we offer the following proposition:

P5. SCL capabilities have a positive impact on sustainable SC performance.

4.3.6 The partial mediation role of dynamic SCM capabilities on the relationship between SCL and sustainable SC performance

At the SC level, the importance of sustainability is well documented in the literature. First, innovation is generally conceded to be essential to a firm's survival and performance (Hull and Rothenberg, 2008). Moreover, when businesses strive to undertake innovative activities related to sustainable development, those activities not only increase economic performance but also benefit the environment and society as a whole (Marti *et al.*, 2013; Sezen and Çankaya, 2013). Gimenez *et al.* (2012) found that businesses that engage in product and process innovation such as life-cycle analysis and design for the environment experience a positive impact on their sustainable performance.

Second, the development of long-term relationships with corresponding stakeholders is considered to be an essential capability in SSCM (Khalid *et al.*, 2015). Relationship development can help achieve more joint development and collaboration (Sánchez and Ricart, 2010), potentially helping firms work together to plan and execute SC operations with greater success (Ashby *et al.*, 2012). The literature also emphasizes the key avenue for firms to build relationships with suppliers that can be positively linked to greening the supply process (Gold *et al.*, 2009).

Third, SCM capabilities such as SC collaboration also have a positive impact on SSCM performance. The implementation of collaborative programs with suppliers leads to environmental performance improvement, and collaboration with suppliers can generate supply materials that pollute less, generate less waste and result in reduced manufacturing costs (Gimenez *et al.*, 2012). The dynamic SCM capabilities of integration and agility are also frequently mentioned and benefit sustainable SC performance (Kim, 2006; Mirghafoori *et al.*, 2017).

There is a strong belief that these dynamic SCM capabilities are highly valued in the relationship between SCL and sustainable SC performance. Innovation can be supported by the resources embedded within the SC, which represents a central element in the process of SCL and transformation towards sustainability (Silvestre, 2015). SC partners would jointly learn how to build capabilities for innovations that help the entire SC to be more sustainable (Silvestre, 2015). Furthermore, development of long-term relationship or collaboration can create a continuous learning process that is important for achieving sustainability (Pedersen and Andersen, 2006). This is because collaboration provides an ideal platform for leaning (Cao *et al.*, 2010), allows and encourages SC partners to work together to improve operation efficiency and effectiveness and address environmental and social issues, which in turn helps to develop sustainable SC performance (Kim *et al.*, 2009; Oelze *et al.*, 2016).

Based on the discussion above, we offer the following proposition:

P6. Dynamic SCM capabilities (innovation, relationship, SC collaboration, integration, agility) mediate the relationship between SCL capabilities and sustainable SC performance.

5. Gaps in the existing research and future research directions

5.1 Gaps in the existing research

Based on the review of the literature, there are four major gaps related to SCL and learning in SCs. First, although learning in the SC does occur, most of the literature is limited to the "dyadic" relationship between two players in a chain (Bessant *et al.*, 2003). However, limiting learning to the first-tier supplier or customer cannot ensure that essential knowledge (e.g. sustainability) is disseminated to the entire chain, potentially causing problems.

Second, few of the 21 related works directly using the term of SCL consider the theoretical depth of the SCL construct, that is, its dimensions. In Section 3.1, it can be seen that the dimensions of SCL primarily use the dimensions of learning in OL. They rarely consider learning in the SC context that contains upstream and downstream simultaneously.

Third, learning is a dynamic process of the creation, acquisition and integration of knowledge aimed at developing the resources and capabilities that allow the organization to achieve better performance (Lopez, 2007). However, much of

the research does not focus on the evolution of SCL. A great deal of empirical learning in the SC relies on cross-sectional data rather than a longitudinal perspective. This static view limits our understanding of how SCL processes take place and how these processes support the development of the SC.

Fourth, as Haslam (2004) point out, inter-organizational connections are based on mutual individual stakeholders' contributions to shared value creation. The creation of collaborative networks between organizations and stakeholders is crucial to leverage a firm's knowledge bases by retrieving and absorbing pertinent knowledge from suppliers, clients, other partners and competitors (Albort-Morant *et al.*, 2018); therefore, stakeholder theory is an appropriate lens for explaining antecedent forces influencing SCL. However, the application of this theory in SCL studies is limited.

5.2 Future research directions

This section proposes some research directions that deserve attention from future researchers based on the conceptual model (Figure 4).

First, we draw readers' attention to drivers and sources of SCL (left in Figure 4). In terms of the drivers, relatively few papers conduct an in-depth study of the relationship between the SC structure and SCL. Spekman *et al.* (2002) developed the measures to reflect the extent to which there are SC structures that support a learning environment. A lack of supporting and enabling structures and procedures is a key block to learning (Bessant and Tsekouras, 2001); for example, the existence of powerful hierarchical and horizontal divisions within an organization may prohibit the free flow of information. Yan and Nair (2016) examined how three types of intergroup structures – administrative (formalization and centralization), task (task interdependence) and physical (colocation) – influence the buyer firm's learning. Further study could explore the SC structure (Awaysheh and Klassen, 2010), including how such constructs as centralization, formalization, and the communication structure affect SCL. One can also adopt a social network perspective to explore how the archetypes of supplier-supplier relationships (Wu and Choi, 2005), the structural characteristics of supply networks (Kim *et al.*, 2011), the structural dynamics involved in multi-tiered SCs (Mena *et al.*, 2013), supplier structural embeddedness (Kim, 2014) and local structural changes (Pathak *et al.*, 2014) lead to the evolution of SCL and different types of SCL (exploratory vs exploitative).

In terms of the sources, only a few studies signify the importance of supplier management on the issue of learning in SCs. There is an increasing need to explore how the SCL process can be facilitated through supplier and customer relationship management. In particular, the successful management of supplier relationships is positively associated with knowledge integration (Revilla and Knoppen, 2015) and enhances productivity through the diffusion of knowledge and mutual assistance with the implementation of good practices (Giannakis, 2008). Bessant *et al.* (2003) also advocated the importance of implementing SCL in a platform of "good practice" supplier management. In addition, it is necessary to capture customer value insights to ensure that SC partners are actively using learning to improve how they serve each other (Flint *et al.*, 2008). Furthermore, the research increasingly acknowledges that a triadic or network-level analysis may shed additional lights on the learning that occurs in buyer–supplier relationships (Dyer and Hatch, 2004).

Future research could adopt stakeholder theory (Freeman, 1984), balance theory (Heider, 1958) and social network theory (Borgatti and Cross, 2003) to explore learning in triadic relationships (Wynstra *et al.*, 2015). One can explore what managers should do (and how they should do it) to nurture more effective relationships to learn (Phillips *et al.*, 1998), how the buying company manages learning in different archetypes of supplier–supplier relationships (Wu and Choi, 2005) and what the learning mechanism is in different triadic archetypes of buyer–supplier–supplier relationships (Choi and Zhaohui, 2009). One can even analyze the effect of relationship characteristics (duration, degree of product standardization, tier position) (Fynes *et al.*, 2008) and relationship dynamics/stability (Mena *et al.*, 2013) on SCL. Furthermore, collecting data on triads is a challenge (Choi and Wu, 2009). A few studies have adopted a qualitative case study (Madhavan *et al.*, 2004; Wu and Choi, 2005; Dubois and Fredriksson, 2008) and survey method (Wu *et al.*, 2010) to analyze triadic relationships. Future research should use different methods (e.g. modelling) to collect and analyze data on learning in triadic relationships.

Furthermore, the link to the SC focal/leading/core company or coordinator literature should be strengthened. The focal companies play an important role in supporting and leading SCL efforts. The focal companies in a SC need to monitor the consistency of learning among chain members within a network to ensure the knowledge that is learned by SC partners (Williams, 2007). In addition, Kaplinsky and Morris (2001) emphasized when a leading partner acts as the SC coordinator (the coordinating or central firm that takes the lead) (Biotto *et al.*, 2012), it can ensure that a learning process occurs throughout the chain. Silvestre (2015) argued that the focal company's initiatives to enhance learning and innovation performance may include developing SC capacity, stimulating learning and innovation culture, building SC capabilities and promoting sustainable practices.

Future studies could consider how the internal capability of a focal company plays a critical role in facilitating or inhibiting learning (Srivastava and Gnyawal, 2011). For example, studies may consider how the focal firm monitors its partners' learning behavior (Norman, 2004). Interesting insights could also be gained by exploring the effects of a focal firm's organizational culture (Delore and Megard, 2011), SCM strategy (Spekman *et al.*, 1998), resource characteristics (Srivastava and Gnyawal, 2011), resource orchestration (Gong *et al.*, 2018) or export status (Salomon and Shaver, 2005) on learning.

Second, in terms of environmental factors, we regard environmental turbulence as the moderator and the effect exhibited as an inverted U-shape. In the future, P3 may be tested using a large sample survey or secondary data analysis. Future research could consider other potential moderators such as the technology context (Iyer, 2014), institutional environment (particularly government ties and financial ties) (Li *et al.*, 2011), ethical climate (Gonzalez-Padron *et al.*, 2008) and SC partner characteristics (compatibility and complementarity) (Fang *et al.*, 2008). Considering the growing trend of outsourcing and offshoring, it might also be of interest

for future research to put SCL in an international context (Hamel, 1991) to see how either cultural distance or the degree of interaction with international suppliers and customers may affect SCL (Jia and Lamming, 2013).

Third, regarding the barriers to SCL, it is not sufficient to know what and how barriers inhibit the successful operation of SCL. Only through identifying and understanding the influence of barriers on learning will the SC organizations know the best way to reduce or manage negative impact (Mclaughlin *et al.*, 2008). For future research, one could explore more potential barriers to SCL and consider how these barriers interact with and affect one another (Mclaughlin *et al.*, 2008). Research should also seek to identify which barrier is acting as the most dominant one in the SCL process using the Interpretive Structural Modelling approach (Mathiyazhagan *et al.*, 2013). After obtaining a better understanding of barriers, a need arises to overcome those barriers by providing solutions. One can use a hybrid multi-criteria technique that combines fuzzy AHP and fuzzy TOPSIS (Patil and Kant, 2014) to rank solutions and overcome barriers.

Fourth, we consider the SCL itself (middle in Figure 4). The literature pays no special attention to the likely coexistence of the cooperation and competition relationship between SC members (Brandenburger and Nalebuff, 1996). In a cooperation and competition environment, if firms regard their SC partners as potential competitors, they may impede knowledge sharing even if they see its advantages (Spekman *et al.*, 2002). This is because sharing key knowledge may increase their partners' competitive advantage, which conflicts with their own interest (Cheng *et al.*, 2008). To address the issue of the co-opetition partnership within SCs, Cheng *et al.* (2008) develop a new research model that treats trust as a mediating construct to investigate the factors influencing inter-organizational knowledge sharing. Verwaal *et al.* (2008) considered the variable of knowledge protection in OL. Hernandez-Espallardo *et al.* (2010) developed a model of learning and performance in SCs, with inter-organizational governance as its facilitator. Jia and Rutherford (2010) proposed a definition of supply chain relational risk (SCRR), which is "the risk to the supply chain of either party in a buyer-supplier relationship not fully committing to joint efforts due to either problems associated with cooperation or problems associated with opportunistic behaviour". Therefore, one appealing future research direction might consider that learning would be accompanied by competition and cooperation, and one could conduct an in-depth investigation into SCL with relationship risk. The SC governance mechanism that includes formal and informal governance mechanisms can take this into consideration (Tachizawa and Wong, 2015). One could explore the different types of governance to see how they interconnect with each other to affect SCL (Ghosh and Fedorowicz, 2008), along with the role of governance in the different types and phases of SCL (Hernandez-Espallardo *et al.*, 2010). It would also be interesting to know how to implement governance to match partners' learning intentions (Mohr and Sengupta, 2002), firms' ownership (Yu *et al.*, 2006) and culture to reduce risk and encourage SCL.

In addition, a strategic alliance indicates long-term cooperation among two or more firms aimed at achieving a shared set of goals through cooperative learning (Mellat-Parast and Digman, 2008). The success of a strategic alliance requires learning culture, knowledge and communication, joint learning structure/process and the development of learning relationships (Love *et al.*, 2002). In contrast, the benefits of alliances are generally attributed to knowledge exchange and learning (Kale *et al.*, 2000). Despite the significant attention given to learning, strategic management remains a key extension of the learning concept.

Future research could address the issue of how to create new opportunities for companies by participating in the alliance and how to transfer knowledge efficiently and effectively within a strategic alliance so that firms can achieve a higher level of performance. Furthermore, one can explore how to measure alliances' learning performance, which can be measured by the degree of knowledge a company acquires, the private and common goals satisfied, or the abilities enhanced. One can also focus on the critical success factors of enhancing an alliance's overall learning quality, for example, leadership. Leaders can play an essential role in facilitating the learning process within the alliance (Inkpen, 2005). Future research could explore how different SC leadership styles affect SCL (Gosling *et al.*, 2016), who emerges as the facilitative leader and when and how leadership develops over time (Lambrechts *et al.*, 2012). Moreover, research could examine which types of partnerships create the opportunity for exploitative and exploratory learning (Hitt, 2011), how the structure and composition of a firm's alliance network affect exploitative and exploratory learning (Phelps, 2010), how to achieve a balance between them (Gupta *et al.*, 2006), how the different sizes of firms affect exploitative and exploratory learning in an alliance (Yang *et al.*, 2014) and SCL in cross-border alliances (Li, 2010).

Moreover, learning and knowledge management are related concepts and are somewhat overlapping (Gavronski *et al.*, 2012), so a great deal of existing literature borrows theories from knowledge management to analyze SCL. Future research on SCL could either continue to use the research base of knowledge management or adopt constructs provided by organizational learning literature, for example, exploitation versus exploration leaning or single loop versus double loop versus triple loop learning (Van Hoof, 2014). However, SCL consists of three different phases: the set-up, operating and sustaining stages (Bessant *et al.*, 2003). It might be interesting for future research to adopt a dynamic learning perspective (Cope, 2005) to consider the traits in each phase, how the different stages of learning impact one another and the feedback of SCL (Crossan *et al.*, 1999) using longitudinal data. As Holmqvist (2003) proposed a dynamic model of OL within and between organizations, we can consider adding SCL with exploitation and exploration to the dynamic model.

Fifth, we discuss the outcomes of SCL (right in Figure 4). Many studies pay attention to economic performance, whereas relatively few SCL studies are linked to sustainability performance. Oelze *et al.* (2016) systematically analyzed how the role of OL influences the implementation of environmental and social practices in SCs. It would also be possible to explore how SCL affects SSCM. Interesting insights could also be obtained on the processes, drivers and outcomes of sustainability-related SCL (Meinlschmidt *et al.*, 2016). Moreover, most of the published papers view SCL performance at a firm level, measuring it only from the focal

company's perspective. Future research could switch the unit of analysis from the firm level to the SC level by investigating the supplier-focal company–customer companies' performance. Specifically, in the future, one could also explicitly study learning's costs and benefits. These costs and benefits can accrue either from the side of the focal firm or from the entire SC.

6. Conclusion

This study has taken a close look at learning in the SC and SCL. We have reviewed 123 studies published from 1998 up to March 2018. To answer the three research questions, first, we discuss the development and concepts of SCL; second, drivers and sources of SCL are identified; third, the main outcomes of learning in SCs can be catalogued into SCM capabilities and sustainable SC performance. Moreover, based on the ERBV, we developed an integrated conceptual framework of SCL.

Overall, the paper makes three theoretical contributions. First, this may be the first study to systematically investigate the topic of SCL or learning in SCs identifying drivers, sources, barriers of SCL and consequences of SCL. Second, adopting the ERBV perspective, this study considers intra- and inter-organizational factors as drivers and sources at a firm or dyadic level, the aggregated effects of which improve SCL as capabilities, which in turn enhance dynamic SC capabilities at the SC level. Ultimately, dynamic SC capabilities improve SSCM performance. This line of arguments significantly enriches the SCL literature integrating different levels of analysis. Third, based on the comprehensive literature review and research gaps identified, we suggest numerous actionable future research directions for future SCL research. The findings of this study can be extended beyond the dyad and be applied in multi-tier SC context.

From a managerial point of view, this literature review could potentially help managers to understand the strategic importance of learning in SC. In particular, with regard to the drivers and sources for firms to promote SCL this research could enhance managers' awareness on how to develop SCL capabilities, help managers to optimize resource configurations and integrate these key factors in their corporate strategy. The proposed outcomes of SCL could assist practitioners in being aware of the importance of SCL and find new ways to develop dynamic capabilities and achieve sustainable SC performance. All in all, the framework can support managers' decisions and assist them to develop competence plans for the future.

This study has limitations. First, although Scopus and WoS cover a wide range of peer-reviewed journals in the social sciences, they do not include all reputable peer-reviewed journals. Therefore, using additional databases or different search terms might have resulted in more complex findings. Second, by focusing on academic journal papers in English, we excluded papers in other types of publications and languages, potentially leading to a loss of knowledge. Third, the findings in this paper strongly depend on the reviewers' experience and educational background. Despite these limitations, our analysis provides findings that will be significant to both academic research and managerial practice.

References

Ado, A., Su, Z. and Wanjiru, R. (2017), "Learning and knowledge transfer in Africa-China JVs: interplay between informalities, culture, and social capital", *Journal of International Management*, Vol. 23 No. 2, pp. 166-179.

Agarwal, R. and Selen, W. (2009), "Dynamic capability building in service value networks for achieving service innovation", *Decision Sciences*, Vol. 40 No. 3, pp. 431-475.

Albort-Morant, G., Leal-Millan, A., Cepeda-Carrion, G. and Henseler, J. (2018), "Developing green innovation performance by fostering of organizational knowledge and coopetitive relations", *Review of Managerial Science*, Vol. 12 No. 2, pp. 499-517.

Anderson, A.R., Benavides-Espinosa, M.D. and Mohedano-Suanes, A. (2011), "Innovation in services through learning in a joint venture", *Service Industries Journal*, Vol. 31 No. 12, pp. 2019-2032.

Anderson, E. and Weitz, B. (1992), "The use of pledges to build and sustain commitment in distribution channels", *Journal of Marketing Research*, Vol. 29 No. 1, pp. 18-34.

Araujo, L., Dubois, A. and Gadde, L.E. (1999), "Managing interfaces with suppliers", *Industrial Marketing Management*, Vol. 28 No. 5, pp. 497-506.

Argote, L. (2005), "Reflections on two views of managing learning and knowledge in organizations", *Journal of Management Inquiry*, Vol. 14 No. 1, pp. 43-48.

Arya, B. and Lin, Z. (2007), "Understanding collaboration outcomes from an extended resource-based view perspective: the roles of organizational characteristics, partner attributes, and network structures", *Journal of Management*, Vol. 33 No. 5, pp. 697-723.

Ashby, A., Leat, M. and Hudson-Smith, M. (2012), "Making connections: a review of supply chain management and sustainability literature", *Supply Chain Management: An International Journal*, Vol. 17 No. 5, pp. 497-516.

Awaysheh, A. and Klassen, R.D. (2010), "The impact of supply chain structure on the use of supplier socially responsible practices", *International Journal of Operations & Production Management*, Vol. 30 No. 12, pp. 1246-1268.

Azadegan, A., Dooley, K.J., Carter, P.L. and Carter, J.R. (2008), "Supplier innovativeness and the role of interorganizational learning in enhancing manufacturer capabilities", *Journal of Supply Chain Management*, Vol. 44 No. 4, pp. 14-35.

Back, I. and Kohtamaki, M. (2016), "Joint learning in innovative R&D collaboration", *Industry and Innovation*, Vol. 23 No. 1, pp. 62-86.

Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management: Official Journal of the Southern Management Association*, Vol. 17 No. 1, pp. 99-120.

Benavides-Espinosa, M.D. and Roig-Dobon, S. (2011), "The influence of cultural differences in cooperative learning through joint ventures", *Service Business*, Vol. 5 No. 1, pp. 69-85.

Benavides-Espiriosa, M.D. and Ribeiro-Soriano, D. (2014), "Cooperative learning in creating and managing joint ventures", *Journal of Business Research*, Vol. 67 No. 4, pp. 648-655.

Bessant, J. and Francis, D. (1999), "Using learning networks to help improve manufacturing competitiveness", *Technovation*, Vol. 19 Nos 6/7, pp. 373-381.

Bessant, J. and Tsekouras, G. (2001), "Developing learning networks", *AI & Society*, Vol. 15 Nos 1/2, pp. 82-98.

Bessant, J., Kaplinsky, R. and Lamming, R. (2003), "Putting supply chain learning into practice", *International Journal of Operations & Production Management*, Vol. 23 No. 2, pp. 167-184.

Biotto, M., De Toni, A.F. and Nonino, F. (2012), "Knowledge and cultural diffusion along the supply chain as drivers of product quality improvement: the Illycaffe case study", *The International Journal of Logistics Management*, Vol. 23 No. 2, pp. 212-237.

Borgatti, S.P. and Cross, R. (2003), "A relational view of information seeking and learning in social networks", *Management Science*, Vol. 49 No. 4, pp. 432-445.

Bouncken, R.B. and Fredrich, V. (2016), "Learning in coopetition: alliance orientation, network size, and firm types", *Journal of Business Research*, Vol. 69 No. 5, pp. 1753-1758.

Bouncken, R.B., Pluschke, B.D., Pesch, R. and Kraus, S. (2016), "Entrepreneurial orientation in vertical alliances: joint product innovation and learning from allies", *Review of Managerial Science*, Vol. 10 No. 2, pp. 381-409.

Bouncken, R.B., Pesch, R. and Kraus, S. (2015), "SME innovativeness in buyer-seller alliances: effects of entry timing strategies and inter-organizational learning", *Review of Managerial Science*, Vol. 9 No. 2, pp. 361-384.

Brandenburger, A.M. and Nalebuff, B.J. (1996), *Co-Opetition*, Bantam Doubleday Dell Publishing Group, New York, NY.

Bucic, T. and Ngo, L.V. (2013), "Achieving alliance innovation via alliance learning: an empirical study", *International Journal of Innovation Management*, Vol. 17 No. 4, p. 1350013.

Butner, K. (2010), "The smarter supply chain of the future", *Strategy & Leadership*, Vol. 38 No. 1, pp. 22-31.

Cai, S.H., Yang, Z.L. and Hu, Z.H. (2010), "The effects of volume consolidation on buyer-supplier relationships: a study of Chinese firms", *Journal of Purchasing and Supply Management*, Vol. 16 No. 3, pp. 152-162.

Cao, M., Vonderembse, M.A., Zhang, Q.Y. and Ragu-Nathan, T.S. (2010), "Supply chain collaboration: conceptualisation and instrument development", *International Journal of Production Research*, Vol. 48 No. 22, pp. 6613-6635.

Chang, K.H. and Gotcher, D.F. (2007), "Safeguarding investments and creation of transaction value in asymmetric international subcontracting relationships: the role of relationship learning and relational capital", *Journal of World Business*, Vol. 42 No. 4, pp. 477-488.

Chen, C.J., Lin, B.W., Lin, J.Y. and Hsiao, Y.C. (2017), "In search of parents' knowledge for joint venture's innovation", *Technology Analysis & Strategic Management*, Vol. 29 No. 2, pp. 190-203.

Chen, Y.S., Lin, M.J.J. and Chang, C.H. (2009), "The positive effects of relationship learning and absorptive capacity on innovation performance and competitive advantage in industrial markets", *Industrial Marketing Management*, Vol. 38 No. 2, pp. 152-158.

Cheng, J.H., Yeh, C.H. and Tu, C.W. (2008), "Trust and knowledge sharing in green supply chains", *Supply Chain Management: An International Journal*, Vol. 13 No. 4, pp. 283-295.

Cheung, M.S., Myers, M.B. and Mentzer, J.T. (2010), "Does relationship learning lead to relationship value? A cross-national supply chain investigation", *Journal of Operations Management*, Vol. 28 No. 6, pp. 472-487.

Cheung, M.S., Myers, M.B. and Mentzer, J.T. (2011), "The value of relational learning in buyer-supplier exchanges: a dyadic perspective and test of the pie-sharing premise", *Strategic Management Journal*, Vol. 32 No. 10, pp. 1061-1082.

Choi, T.Y. and Wu, Z. (2009), "Taking the leap from dyads to triads: buyer–supplier relationships in supply networks", *Journal of Purchasing & Supply Management*, Vol. 15 No. 4, pp. 263-266.

Choi, T.Y. and Zhaohui, W.U. (2009), "Triads in supply networks: theorizing buyer-supplier-supplier relationships", *Journal of Supply Chain Management*, Vol. 45 No. 1, pp. 8-25.

Coghlan, D. and Coughlan, P. (2015), "Effecting change and learning in networks through network action learning", *Journal of Applied Behavioral Science*, Vol. 51 No. 3, pp. 375-400.

Cope, J. (2005), "Toward a dynamic learning perspective of entrepreneurship", *Entrepreneurship Theory and Practice*, Vol. 29 No. 4, pp. 373-397.

Crossan, M.M., Lane, H.W. and White, R.E. (1999), "An organizational learning framework: from intuition to institution", *Academy of Management Review*, Vol. 24 No. 3, pp. 522-537.

Cyert, R. and March, J. (1963), *Behavioral Theory of the Firm*, Blackwell, Oxford.

Das, T.K. and Teng, B.S. (2000), "A resource-based theory of strategic alliances", *Journal of Management: Official Journal of the Southern Management Association*, Vol. 26 No. 1, pp. 31-61.

Day, G.S. (1994), "The capabilities of market-driven organisations", *Journal of Marketing*, Vol. 58 No. 4, pp. 37-52.

Defee, C.C. and Fugate, B.S. (2010), "Changing perspective of capabilities in the dynamic supply chain era", *The International Journal of Logistics Management*, Vol. 21 No. 2, pp. 180-206.

Delore, P. and Megard, M. (2011), "Strategic decision-making processes in internationalization: does national culture of the focal firm matter?", *Journal of World Business*, Vol. 46 No. 2, pp. 194-204.

Dolan, S.L., Garcia, S. and Auerbach, A. (2003), "Understanding and managing chaos in organisations", *International Journal of Management*, Vol. 20 No. 1, pp. 23-35.

Dubois, A. and Fredriksson, P. (2008), "Cooperating and competing in supply networks: making sense of a triadic sourcing strategy", *Journal of Purchasing & Supply Management*, Vol. 14 No. 3, pp. 170-179.

Dyer, J.H. and Hatch, N.W. (2004), "Using supplier networks to learn faster", *Mit Sloan Management Review*, Vol. 45 No. 3, pp. 57-63.

Dyer, J.H. and Kentaro, N. (2000), "Creating and managing a high-performance knowledge-sharing network: the Toyota case", *Strategic Management Journal*, Vol. 21 No. 3, pp. 345-367.

Dyer, J.H. and Singh, H. (1998), "The relational view: cooperative strategy and sources of interorganizational competitive advantage", *Academy of Management Review*, Vol. 23 No. 4, pp. 660-679.

Dyer, L. and Shafer, R.A. (1999), "From human resource strategy to organizational effectiveness: lessons from research on organizational agility", *Research in Personnel and Human Resource Management*, Vol. 4, pp. 145-174.

Ehrgott, M., Reimann, F., Kaufmann, L. and Carter, C.R. (2011), "Social sustainability in selecting emerging economy suppliers", *Journal of Business Ethics*, Vol. 98 No. 1, pp. 99-119.

Ehrgott, M., Reimann, F., Kaufmann, L. and Carter, C.R. (2013), "Environmental development of emerging economy suppliers: antecedents and outcomes", *Journal of Business Logistics*, Vol. 34 No. 2, pp. 131-147.

Eiriz, V., Goncalves, M. and Areias, J.S. (2017), "Inter-organizational learning within an institutional knowledge network: a case study in the textile and clothing industry", *European Journal of Innovation Management*, Vol. 20 No. 2, pp. 230-249.

Eisenhardt, K.M. and Martin, J.A. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21 Nos 10/11, pp. 1105-1121.

Emden, Z., Yaprak, A. and Cavusgil, S.T. (2005), "Learning from experience in international alliances: antecedents and firm performance implications", *Journal of Business Research*, Vol. 58 No. 7, pp. 883-892.

Fang, S.R., Fang, S.C., Chou, C.H., Yang, S.M. and Tsai, F. S. (2011), "Relationship learning and innovation: the role of relationship-specific memory", *Industrial Marketing Management*, Vol. 40 No. 5, pp. 743-753.

Fang, S.R., Wu, J.J., Fang, S.C., Chang, Y.S. and Chao, P.W. (2008), "Generating effective interorganizational change: a relational approach", *Industrial Marketing Management*, Vol. 37 No. 8, pp. 977-991.

Fiol, C.M. and Lyles, M.A. (1985), "Organizational learning", *Academy of Management Review*, Vol. 10 No. 4, pp. 803-813.

Flint, D.J., Larsson, E. and Gammelgaard, B. (2008), "Exploring processes for customer value insights, supply chain learning and innovation: an international study", *Journal of Business Logistics*, Vol. 29 No. 1, pp. 257-281.

Flint, D.J., Larsson, E., Gammelgaard, B. and Mentzer, J.T. (2005), "Logistics innovation: a customer value-oriented social process", *Journal of Business Logistics*, Vol. 26 No. 1, pp. 113-147.

Francis, S. (1997), "A time for reflection: learning about organizational learning", *The Learning Organization*, Vol. 4 No. 4, pp. 168-179.

Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*, Pitman Publishing, Boston.

Fu, W.Y., Diez, J.R. and Schiller, D. (2013), "Interactive learning, informal networks and innovation: evidence from electronics firm survey in the Pearl River Delta, China", *Research Policy*, Vol. 42 No. 3, pp. 635-646.

Fynes, B., Búrca, S.D. and Mangan, J. (2008), "The effect of relationship characteristics on relationship quality and performance", *International Journal of Production Economics*, Vol. 111 No. 1, pp. 56-69.

Gavronski, I., Klassen, R.D., Vachon, S. and Do Nascirnento, L.F.M. (2012), "A learning and knowledge approach to sustainable operations", *International Journal of Production Economics*, Vol. 140 No. 1, pp. 183-192.

Ghosh, A. and Fedorowicz, J. (2008), "The role of trust in supply chain governance", *Business Process Management Journal*, Vol. 14 No. 4, pp. 453-470.

Giannakis, M. (2008), "Facilitating learning and knowledge transfer through supplier development", *Supply Chain Management: An International Journal*, Vol. 13 No. 1, pp. 62-72.

Gibb, J., Sune, A. and Albers, S. (2017), "Network learning: episodes of interorganizational learning towards a collective performance goal", *European Management Journal*, Vol. 35 No. 1, pp. 15-25.

Gimenez, C. and Tachizawa, E.M. (2012), "Extending sustainability to suppliers: a systematic literature review", *Supply Chain Management: An International Journal*, Vol. 17 No. 5, pp. 531-543.

Gimenez, C., Sierra, V. and Rodon, J. (2012), "Sustainable operations: their impact on the triple bottom line", *International Journal of Production Economics*, Vol. 140 No. 1, pp. 149-159.

Gold, S., Seuring, S. and Beske, P. (2009), "Sustainable supply chain management and inter-organizational resources: a literature review", *Corporate Social Responsibility & Environmental Management*, Vol. 17 No. 64, pp. 230-245.

Golgeci, I. and Arslan, A. (2014), "Internationalization of emerging economy firms to developed economies: a discussion on institutional pressures and marketing and supply chain capabilities", *Journal of Strategic Marketing*, Vol. 22 No. 7, pp. 587-602.

Gong, Y., Jia, F., Brown, S. and Koh, L. (2018), "Supply chain learning of sustainability in multi-tier supply chains: a resource orchestration perspective", *International Journal of Operations & Production Management*, Vol. 38 No. 4, pp. 1061-1090.

Gonzalez-Padron, T., Hult, G.T.M. and Calantone, R. (2008), "Exploiting innovative opportunities in global purchasing: an assessment of ethical climate and relationship performance", *Industrial Marketing Management*, Vol. 37 No. 1, pp. 69-82.

Gosling, J., Jia, F., Gong, Y. and Brown, S. (2016), "The role of supply chain leadership in the learning of sustainable practice: toward an integrated framework", *Journal of Cleaner Production*, Vol. 137, pp. 1458-1469.

Grant, R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17 No. S2, pp. 109-122.

Grawe, S.J. (2009), "Logistics innovation: a literature-based conceptual framework", *The International Journal of Logistics Management*, Vol. 20 No. 3, pp. 360-377.

Grosse, R. and Fonseca, A. (2012), "Learning through imports in the internationalization process", *Journal of International Management*, Vol. 18 No. 4, pp. 366-378.

Gupta, A.K., Smith, K.G. and Shalley, C.E. (2006), "The interplay between exploration and exploitation", *Academy of Management Journal*, Vol. 49 No. 4, pp. 693-706.

Hamel, G. (1991), "Competition for competence and inter-partner learning within international strategic alliances", *Strategic Management Journal*, Vol. 12 No. S1, pp. 83-103.

Harland, C.M. (1996), "Supply chain management: relationships, chains and networks", *British Journal of Management*, Vol. 7 No. S1, pp. S63-S80.

Haslam, N. (2004), *Relational Models Theory: A Contemporary Overview*, Lawrence Erlbaum Associates, Mahwah.

Hauser, J.R., Simester, D.I. and Wernerfelt, B. (1996), "Internal customers and internal suppliers", *Journal of Marketing Research*, Vol. 33 No. 3, pp. 268-280.

Heider, F. (1958), *The Psychology of Interpersonal Relations*, John Wiley and Sons, New York, NY.

Hernandez-Espallardo, M., Sanchez-Perez, M. and Segovia-Lopez, C. (2011), "Exploitation- and exploration-based innovations: the role of knowledge in inter-firm relationships with distributors", *Technovation*, Vol. 31 Nos 5/6, pp. 203-215.

Hernandez-Espallardo, M., Rodriguez-Orejuela, A. and Sanchez-Perez, M. (2010), "Inter-organizational governance, learning and performance in supply chains", *Supply Chain Management: An International Journal*, Vol. 15 No. 2, pp. 101-114.

Hitt, M.A. (2011), "Relevance of strategic management theory and research for supply chain management", *Journal of Supply Chain Management*, Vol. 47 No. 1, pp. 9-13.

Holmqvist, M. (2003), "A dynamic model of intra-and interorganizational learning", *Organization Studies*, Vol. 24 No. 1, pp. 95-123.

Huang, X.W., Kristal, M.M. and Schroeder, R.G. (2008), "Linking learning and effective process implementation to mass customization capability", *Journal of Operations Management*, Vol. 26 No. 6, pp. 714-729.

Huang, Y.T. and Chu, W. (2010), "Enhancement of product development capabilities of OEM suppliers: inter- and intra-organisational learning", *Journal of Business and Industrial Marketing*, Vol. 25 No. 2, pp. 147-158.

Huber, G.P. (1991), "Organizational learning: the contributing processes and the literatures", *Organization Science*, Vol. 2 No. 1, pp. 88-115.

Huikkola, T., Ylimaki, J. and Kohtamaki, M. (2013), "Joint learning in R&D collaborations and the facilitating relational practices", *Industrial Marketing Management*, Vol. 42 No. 7, pp. 1167-1180.

Hull, C.E. and Rothenberg, S. (2008), "Firm performance: the interactions of corporate social performance with innovation and industry differentiation", *Strategic Management Journal*, Vol. 29 No. 7, pp. 781-789.

Hult, G.T.A., Ketchen, D.J. and Nichols, E.L. (2003), "Organizational learning as a strategic resource in supply management", *Journal of Operations Management*, Vol. 21 No. 5, pp. 541-556.

Hult, G.T.M., Hurley, R.F. and Knight, G.A. (2004), "Innovativeness: its antecedents and impact on business performance", *Industrial Marketing Management*, Vol. 33 No. 5, pp. 429-438.

Hult, G.T.M., Ketchen, D.J. and Arrfelt, M. (2007), "Strategic supply chain management: improving performance through a culture of competitiveness and knowledge development", *Strategic Management Journal*, Vol. 28 No. 10, pp. 1035-1052.

Hult, G.T.M., Nichols, E.L., Giunipero, L.C. and Hurley, R. F. (2000), "Global organizational learning in the supply chain: a low versus high learning study", *Journal of International Marketing*, Vol. 8 No. 3, pp. 61-83.

Hunt, S.D. and Morgan, R.M. (1996), "The resource-advantage theory of competition: dynamics, path dependencies, and evolutionary dimensions", *Journal of Marketing*, Vol. 60 No. 4, pp. 107-114.

Im, G.Y. and Rai, A. (2008), "Knowledge sharing ambidexterity in long-term interorganizational relationships", *Management Science*, Vol. 54 No. 7, pp. 1281-1296.

Inkpen, A.C. (2005), "Learning through alliances: general motors and NUMMI", *Strategic Direction*, Vol. 47 No. 4, pp. 114-136.

Ireland, R.D. and Webb, J.W. (2007), "A multi-theoretic perspective on trust and power in strategic supply chains", *Journal of Operations Management*, Vol. 25 No. 2, pp. 482-497.

Iyer, K.N.S. (2014), "Operational impact of collaboration and resource specificity: the moderating role of technology context", *Journal of Business & Industrial Marketing*, Vol. 29 No. 5, pp. 387-399.

Janowicz-Panjaitan, M. and Noorderhaven, N.G. (2008), "Formal and informal interorganizational learning within strategic alliances", *Research Policy*, Vol. 37 No. 8, pp. 1337-1355.

Jap, S.D. (2013), "Pie sharing' in complex collaboration contexts", *Journal of Marketing Research*, Vol. 38 No. 1, pp. 86-99.

Jean, R.J., Chiou, J.S. and Sinkovics, R.R. (2016), "Interpartner learning, dependence asymmetry and radical innovation in customer-supplier relationships, *Journal of Business & Industrial Marketing*, Vol. 31 No. 6, pp. 732-742.

Jean, R.J., Kim, D. and Bello, D.C. (2017), "Relationship-based product innovations: evidence from the global supply chain", *Journal of Business Research*, Vol. 80, pp. 127-140.

Jean, R.J., Kim, D. and Sinkovics, R.R. (2012), "Drivers and performance outcomes of supplier innovation generation in customer-supplier relationships: the role of power-dependence", *Decision Sciences*, Vol. 43 No. 6, pp. 1003-1038.

Jean, R.J., Kim, D. and Sinkovics, R.R. (2012), "Drivers and performance outcomes of supplier innovation generation in customer-supplier relationships: the role of power-dependence", *Decision Sciences*, Vol. 43 No. 6, pp. 1003-1038.

Jean, R.J.B. and Sinkovics, R.R. (2010), "Relationship learning and performance enhancement via advanced information technology: the case of taiwanese dragon electronics firms", *International Marketing Review*, Vol. 27 No. 2, pp. 200-222.

Jean, R.J.B., Sinkovics, R.R. and Kim, D. (2010), "Drivers and performance outcomes of relationship learning for suppliers in cross-border customer-supplier relationships: the role of communication culture", *Journal of International Marketing*, Vol. 18 No. 1, pp. 63-85.

Jia, F. and Lamming, R. (2013), "Cultural adaptation in Chinese-Western supply chain partnerships", *International Journal of Operations & Production Management*, Vol. 33 No. 5, pp. 528-561.

Jia, F. and Rutherford, C. (2010), "Mitigation of supply chain relational risk caused by cultural differences between China and the west", *The International Journal of Logistics Management*, Vol. 21 No. 2, pp. 251-270.

Jiang, X. and Li, Y. (2008), "The relationship between organizational learning and firms' financial performance in strategic alliances: a contingency approach", *Journal of World Business*, Vol. 43 No. 3, pp. 365-379.

Jiménez-Jiménez, D. and Sanz-Valle, R. (2011), "Innovation, organizational learning, and performance", *Journal of Business Research*, Vol. 64 No. 4, pp. 408-417.

Johansson, G. (2002), "Success factors for integration of ecodesign in product development: a review of state of the art", *Environmental Management and Health*, Vol. 13 No. 1, pp. 98-107.

Kahkonen, A.K., Lintukangas, K. and Hallikas, J. (2015), "Buyer's dependence in value creating supplier relationships", *Supply Chain Management-an International Journal*, Vol. 20 No. 2, pp. 151-162.

Kahkonen, A.K., Lintukangas, K., Ritala, P. and Hallikas, J. (2017), "Supplier collaboration practices: implications for focal firm innovation performance", *European Business Review*, Vol. 29 No. 4, pp. 402-418.

Kale, P. and Singh, H. (2007), "Building firm capabilities through learning: the role of the alliance learning process in alliance capability and firm-level alliance success", *Strategic Management Journal*, Vol. 28 No. 10, pp. 981-1000.

Kale, P., Singh, H. and Perlmutter, H. (2000), "Learning and protection of proprietary assets in strategic alliances: building relational Capital", *Strategic Management Journal*, Vol. 21 No. 3, pp. 217-237.

Kalwani, M.U. and Narayandas, N. (1995), "Long-term manufacturer-supplier relationships: do they pay off for supplier firms?", *Journal of Marketing*, Vol. 59 No. 1, pp. 1-16.

Kaplinsky, R. and Morris, M. (2001), *A Handbook for Value Chain Research*, International Development Research Centre.

Kates, R.W., Clark, W.C., Corell, R., Hall, J.M., Jaeger, C. C., Lowe, I., Mccarthy, J.J., Schellnhuber, H.J., Bolin, B. and Dickson, N.M. (2001), "Environment and development: sustainability science", *Science*, Vol. 292 No. 5517, pp. 641-642.

Khalid, R.U., Seuring, S., Beske, P., Land, A., Yawar, S.A. and Wagner, R. (2015), "Putting sustainable supply chain management into base of the pyramid research", *Supply Chain Management: An International Journal*, Vol. 20 No. 6, pp. 681-696.

Kim, D.Y. (2014), "Understanding supplier structural embeddedness: a social network perspective", *Journal of Operations Management*, Vol. 32 No. 5, pp. 219-231.

Kim, J.W., Lindgreen, A. and Lee, K.H. (2009), "Current status of CSR in the realm of supply management: the case of the Korean electronics industry", *Supply Chain Management: An International Journal*, Vol. 14 No. 2, pp. 335-340.

Kim, S.W. (2006), "Effects of supply chain management practices, integration and competition capability on performance", *Supply Chain Management: An International Journal*, Vol. 11 No. 3, pp. 241-248.

Kim, Y., Choi, T.Y., Yan, T. and Dooley, K. (2011), "Structural investigation of supply networks: a social network analysis approach", *Journal of Operations Management*, Vol. 29 No. 3, pp. 194-211.

Klewitz, J. and Hansen, E.G. (2014), "Sustainability-oriented innovation of SMEs: a systematic review", *Journal of Cleaner Production*, Vol. 65 No. 4, pp. 57-75.

Knight, and Hyneman, F. (1921), *Risk, Uncertainty and Profit*, Houghton Mifflin Company.

Knoppen, D., Christiaanse, E. and Huysman, M. (2010), "Supply chain relationships: exploring the linkage between inter-organisational adaptation and learning", *Journal of Purchasing and Supply Management*, Vol. 16 No. 3, pp. 195-205.

Knoppen, D., Johnston, D. and Saenz, M.J. (2015), "Supply chain relationships as a context for learning leading to innovation", *International Journal of Logistics Management*, Vol. 26 No. 3, pp. 543-567.

Kristal, M.M., Huang, X. and Roth, A.V. (2010), "The effect of an ambidextrous supply chain strategy on combinative competitive capabilities and business performance", *Journal of Operations Management*, Vol. 28 No. 5, pp. 415-429.

Lai, C.S., Pai, D.C., Yang, C.F. and Lin, H.J. (2009), "The effects of market orientation on relationship learning and relationship performance in industrial marketing: the dyadic perspectives", *Industrial Marketing Management*, Vol. 38 No. 2, pp. 166-172.

Lai, F., Zhang, M., Lee, D.M.S. and Zhao, X. (2012), "The impact of supply chain integration on mass customization capability: an extended resource-based view", *IEEE Transactions on Engineering Management*, Vol. 59 No. 3, pp. 443-456.

Lambrechts, F., Taillieu, T., Grieten, S. and Poisquet, J. (2012), "In-depth joint supply chain learning: towards a framework", *Supply Chain Management: An International Journal*, Vol. 17 No. 6, pp. 627-637.

Lane, P.J. and Lubatkin, M. (1998), "Relative absorptive capacity and interorganizational learning", *Strategic Management Journal*, Vol. 19 No. 5, pp. 461-477.

Lavie, D. (2006), "The competitive advantage of interconnected firms: an extension of the resource-based view", *Academy of Management Review*, Vol. 31 No. 3, pp. 638-658.

Leal-Millan, A., Roldan, J.L., Leal-Rodriguez, A.L. and Ortega-Gutierrez, J. (2016), "IT and relationship learning in networks as drivers of green innovation and customer capital: evidence from the automobile sector", *Journal of Knowledge Management*, Vol. 20 No. 3, pp. 444-464.

Lee, I.G., Kim, S.Y., Lee, O.S., Lee, H.K., Yeon, S.J., Song, Y.W. and Kim, J. (2013), "Product orientations and the development strategies of new convergence products: moderating effects of corporate capabilities", *Asian Journal of Technology Innovation*, Vol. 21 No. 1, pp. 34-51.

Levinthal, D.A. and March, J.G. (1993), "The myopia of learning", *Strategic Management Journal*, Vol. 14 No. S2, pp. 95-112.

Levitt, B. and March, J.G. (1988), "Organizational learning", *Annual Review of Sociology*, Vol. 14 No. 1, pp. 319-340.

Lewis, M., Brandon-Jones, A., Slack, N. and Howard, M. (2010), "Competing through operations and supply", *International Journal of Operations & Production Management*, Vol. 30 No. 10, pp. 1032-1058.

Li, L.Y. (2006), "Relationship learning at trade shows: its antecedents and consequences", *Industrial Marketing Management*, Vol. 35 No. 2, pp. 166-177.

Li, P.P. (2010), "Toward a learning-based view of internationalization: the accelerated trajectories of cross-border learning for latecomers", *Journal of International Management*, Vol. 16 No. 1, pp. 43-59.

Li, Y.A., Wang, L.W. and Liu, Y. (2011), "Organisational learning, product quality and performance: the moderating effect of social ties in Chinese cross-border outsourcing", *International Journal of Production Research*, Vol. 49 No. 1, pp. 159-182.

Liu, C.L. and Zhang, Y. (2014), "Learning process and capability formation in cross-border buyer-supplier relationships: a qualitative case study of Taiwanese technological firms", *International Business Review*, Vol. 23 No. 4, pp. 718-730.

Lin, C.W., Wu, L.Y. and Chiou, J.S. (2017), "The use of asset specific investments to increase customer dependence: a study of OEM suppliers", *Industrial Marketing Management*, Vol. 67, pp. 174-184.

Ling-Yee, L. (2007), "The effects of relationship governance mechanisms on relationship performance: how do relationship learning processes matter?", *Journal of Marketing Channels*, Vol. 14 No. 3, pp. 5-30.

Liu, C.L.E. (2012), "An investigation of relationship learning in cross-border buyer-supplier relationships: the role of trust", *International Business Review*, Vol. 21 No. 3, pp. 311-327.

Loke, S.P., Downe, A.G., Sambasivan, M. and Khalid, K. (2012), "A structural approach to integrating total quality management and knowledge management with supply chain learning", *Journal of Business Economics and Management*, Vol. 13 No. 4, pp. 776-800.

Lopez, S.P. (2007), "Human resource management as a determining factor in organizational learning", *Development and Learning in Organizations: An International Journal*, Vol. 21 No. 2, pp. 215-239.

Love, P.E.D., Irani, Z., Cheng, E. and Heng, L.I. (2002), "A model for supporting inter-organizational relations in the supply chain", *Engineering, Construction and Architectural Management*, Vol. 9 No. 1, pp. 2-15.

Madhavan, R., Gnyawali, D.R. and He, J. (2004), "Two's company, three's a crowd? Triads in cooperative-competitive networks", *Academy of Management Journal*, Vol. 47 No. 6, pp. 918-927.

Manley, K. and Chen, L. (2017), "Collaborative learning to improve the governance and performance of infrastructure projects in the construction sector", *Journal of Management in Engineering*, Vol. 33 No. 5, pp. 1-14.

Manuj, I., Omar, A. and Yazdanparast, A. (2013), "The quest for competitive advantage in global supply chains: the role of interorganizational learning", *Transportation Journal*, Vol. 52 No. 4, pp. 463-492.

Maqsood, T., Walker, D. and Finegan, A. (2007), "Extending the "knowledge advantage": creating learning chains", *The Learning Organization, Vol. 14* No. 2, pp. 123-141.

March, J.G. (1981), "Footnotes to organizational change", *Administrative Science Quarterly*, Vol. 26 No. 4, pp. 563-577.

March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organization Science*, Vol. 2 No. 1, pp. 71-87.

March, J.G. and Olsen, J.P. (1975), "The uncertainty of the past: organizational learning under ambiguity", *European Journal of Political Research*, Vol. 3 No. 2, pp. 147-171.

Marquardt, M. and Reynolds, A. (1994), *The Global Learning Organization*, Irwin, New York, NY.

Marti, C.P., Rovira-Val, M.R. and Drescher, L.G.J. (2013), "Are firms that contribute to sustainable development better financially?", *Corporate Social Responsibility and Environmental Management*, Vol. 22 No. 5, pp. 257-319.

Mason, K., Oshri, I. and Leek, S. (2012), "Shared learning in supply networks: evidence from an emerging market supply network", *European Journal of Marketing*, Vol. 46 Nos 11/12, pp. 1743-1762.

Mathews, J.A. (2003), "Competitive dynamics and economic learning: an extended resource-based view", *Industrial and Corporate Change*, Vol. 12 No. 1, pp. 115-145.

Mathiyazhagan, K., Govindan, K., Noorulhaq, A. and Geng, Y. (2013), "An ISM approach for the barrier analysis in implementing green supply chain management", *Journal of Cleaner Production*, Vol. 47 No. 5, pp. 283-297.

Mclaughlin, S., Paton, R.A. and Macbeth, D.K. (2008), "Barrier impact on organizational learning within complex organizations", *Journal of Knowledge Management*, Vol. 12 No. 2, pp. 107-123.

Meinlschmidt, J., Foerstl, K. and Kirchoff, J.F. (2016), "The role of absorptive and desorptive capacity (ACDC) in sustainable supply management - a longitudinal analysis", *International Journal of Physical Distribution & Logistics Management*, Vol. 46 No. 2, pp. 177-211.

Mellat-Parast, M. (2013), "Supply chain quality management: an inter-organizational learning perspective", *International Journal of Quality & Reliability Management*, Vol. 30 No. 5, pp. 511-529.

Mellat-Parast, M. and Digman, L.A. (2007), "A framework for quality management practices in strategic alliances", *Management Decision*, Vol. 45 No. 4, pp. 802-818.

Mellat-Parast, M. and Digman, L.A. (2008), "Learning: the interface of quality management and strategic alliances", *International Journal of Production Economics*, Vol. 114 No. 2, pp. 820-829.

Mena, C., Humphries, A. and Choi, T.Y. (2013), "Toward a theory of multi-tier supply chain management", *Journal of Supply Chain Management*, Vol. 49 No. 2, pp. 58-77.

Mirghafoori, S.H., Andalib, D. and Keshavarz, P. (2017), "Developing green performance through supply chain agility in manufacturing industry: a case study approach", *Corporate Social Responsibility and Environmental Management*, Vol. 24 No. 5, pp. 368-381.

Mohr, J. and Spekman, R. (1994), "Characteristics of partnership success: partnership attributes, communication behavior, and conflict resolution techniques", *Strategic Management Journal*, Vol. 15 No. 2, pp. 135-152.

Mohr, J.J. and Sengupta, S. (2002), "Managing the paradox of inter-firm learning: the role of governance mechanisms", *Journal of Business & Industrial Marketing*, Vol. 17 No. 4, pp. 282-301.

Morris, M., Bessant, J. and Barnes, J. (2006), "Using learning networks to enable industrial development: case studies from South Africa", *International Journal of Operations & Production Management*, Vol. 26 No. 5, pp. 532-557.

Muthusamy, S.K. and White, M.A. (2005), "Learning and knowledge transfer in strategic alliances: a social exchange view", *Organization Studies*, Vol. 26 No. 3, pp. 415-441.

Ngai, E.W.T., Chau, D.C.K. and Chan, T.L.A. (2011), "Information technology, operational, and management competencies for supply chain agility: findings from case studies", *The Journal of Strategic Information Systems*, Vol. 20 No. 3, pp. 232-249.

Nissen, M.E. (2005), "Dynamic knowledge patterns to inform design: a field study of knowledge stocks and flows in an extreme organization", *Journal of Management Information Systems*, Vol. 22 No. 3, pp. 225-263.

Nonaka, I. (1994), "A dynamic theory of organizational knowledge creation", *Organization Science*, Vol. 5 No. 1, pp. 14-37.

Norman, P.M. (2004), "Knowledge acquisition, knowledge loss, and satisfaction in high technology alliances", *Journal of Business Research*, Vol. 57 No. 6, pp. 610-619.

Oelze, N., Hoejmose, S.U., Habisch, A. and Millington, A. (2016), "Sustainable development in supply chain management: the role of organizational learning for policy implementation", *Business Strategy and the Environment*, Vol. 25 No. 4, pp. 241-260.

Ojha, D., Acharya, C. and Cooper, D. (2018), "Transformational leadership and supply chain ambidexterity: mediating role of supply chain organizational learning and moderating role of uncertainty", *International Journal of Production Economics*, Vol. 197, pp. 215-231.

Ojha, D., Shockley, J. and Acharya, C. (2016), "Supply chain organizational infrastructure for promoting entrepreneurial emphasis and innovativeness: the role of trust and learning", *International Journal of Production Economics*, Vol. 179, pp. 212-227.

Olorunniwo, F.O. and Li, X. (2010), "Information sharing and collaboration practices in reverse logistics", *Supply Chain Management: An International Journal*, Vol. 15 No. 6, pp. 454-462.

Panayides, P.A. and So, M. (2005), "Logistics service provider-client relationships", *Transportation Research Part E-Logistics and Transportation Review*, Vol. 41 No. 3, pp. 179-200.

Pathak, S.D., Wu, Z. and Johnston, D. (2014), "Toward a structural view of co-opetition in supply networks", *Journal of Operations Management*, Vol. 32 No. 5, pp. 254-267.

Patil, S.K. and Kant, R. (2014), "A fuzzy AHP-TOPSIS framework for ranking the solutions of knowledge management adoption in supply chain to overcome its barriers", *Expert Systems with Applications*, Vol. 41 No. 2, pp. 679-693.

Pérez-Nordtvedt, L., Mukherjee, D. and Kedia, B.L. (2015), "Cross-border learning, technological turbulence and firm performance", *Management International Review*, Vol. 55 No. 1, pp. 23-51.

Pedersen, E.R. and Andersen, M. (2006), "Safeguarding corporate social responsibility (CSR) in global supply chains: how codes of conduct are managed in buyer-supplier relationships", *Journal of Public Affairs*, Vol. 6 Nos 3/4, pp. 228-240.

Phelps, C.C. (2010), "A longitudinal study of the influence of alliance network structure and composition on firm exploratory innovation", *Academy of Management Journal*, Vol. 53 No. 4, pp. 890-913.

Phillips, J.M., Lin, B.S. and Costello, T.G. (1998), "A balance theory perspective of triadic supply chain relationships", *Journal of Marketing Theory & Practice*, Vol. 6 No. 4, pp. 78-91.

Pothukuchi, V., Damanpour, F., Choi, J., Chen, C.C. and Park, S.H. (2002), "National and organizational culture differences and international joint venture performance", *Journal of International Business Studies*, Vol. 33 No. 2, pp. 243-265.

Preiss, K. and Murray, P.A. (2005), "Fashions of learning: improving supply-chain relationships", *Supply Chain Management: An International Journal*, Vol. 10 No. 1, pp. 18-25.

Rangarajan, D., Chonko, L.B., Jones, E. and Roberts, J.A. (2004), "Organizational variables, sales force perceptions of readiness for change, learning, and performance among boundary-spanning teams: a conceptual framework and propositions for research", *Industrial Marketing Management*, Vol. 33 No. 4, pp. 289-305.

Rebolledo, C. and Nollet, J. (2011), "Learning from suppliers in the aerospace industry", *International Journal of Production Economics*, Vol. 129 No. 2, pp. 328-337.

Revilla, E. and Knoppen, D. (2015), "Building knowledge integration in buyer-supplier relationships", *International Journal of Operations & Production Management*, Vol. 35 No. 10, pp. 1408-1436.

Richey, R.G. and Autry, C.W. (2009), "Assessing interfirm collaboration/technology investment tradeoffs: the effects of technological readiness and organizational learning", *The International Journal of Logistics Management*, Vol. 20 No. 1, pp. 30-56.

Richey, R.G., Genchev, S.E. and Daugherty, P.J. (2005), "The role of resource commitment and innovation in reverse logistics performance", *International Journal of Physical Distribution & Logistics Management*, Vol. 35 No. 4, pp. 233-257.

Roy, S., Sivakumar, K. and Wilkinson, I.F. (2004), "Innovation generation in supply chain relationships: a conceptual model and research propositions", *Journal of the Academy of Marketing Science*, Vol. 32 No. 1, pp. 61-79.

Sánchez, P. and Ricart, J.E. (2010), "Business model innovation and sources of value creation in low-income markets", *European Management Review*, Vol. 7 No. 3, pp. 138-154.

Salomon, R.M. and Shaver, J.M. (2005), "Learning by exporting: new insights from examining firm innovation", *Journal of Economics Management Strategy*, Vol. 14 No. 2, pp. 431-460.

Sambasivan, M., Loke, S.-P. and Abidin-Mohamed, Z. (2009), "Impact of knowledge management in supply chain management: a study in Malaysian manufacturing companies", *Knowledge and Process Management*, Vol. 16 No. 3, pp. 111-123.

Schoenherr, T., Narasimhan, R. and Bandyopadhyay, P. (2015), "The assurance of food safety in supply chains via relational networking: a social network perspective", *International Journal of Operations & Production Management*, Vol. 35 No. 12, pp. 1662-1687.

Schroeder, R.G., Bates, K.A. and Junttila, M.A. (2002), "A resource-based view of manufacturing strategy and the relationship to manufacturing performance", *Strategic Management Journal*, Vol. 23 No. 2, pp. 105-117.

Selnes, F. and Sallis, J. (2003), "Promoting relationship learning", *Journal of Marketing*, Vol. 67 No. 3, pp. 80-95.

Selviaridis, K. and Spring, M. (2018), "Supply chain alignment as process: contracting, learning and pay-for-performance", *International Journal of Operations and Production Management*, Vol. 38 No. 3, pp. 732-755.

Sengun, A.E. (2010), "Which type of trust for inter-firm learning?", *Industry and Innovation*, Vol. 17 No. 2, pp. 193-213.

Sengun, A.E. and Onder, C. (2011), "The conditional impact of competence trust on inter-firm learning in a collectivist SME context", *Industry and Innovation*, Vol. 18 No. 8, pp. 791-812.

Sezen, B. and Çankaya, S.Y. (2013), "Effects of green manufacturing and eco-innovation on sustainability performance", *Procedia - Social and Behavioral Sciences*, Vol. 99 No. 6, pp. 154-163.

Shakeri, R. and Radfar, R. (2017), "Antecedents of strategic alliances performance in biopharmaceutical industry: a comprehensive model", *Technological Forecasting and Social Change*, Vol. 122, pp. 289-302.

Silvestre, B.S. (2015), "Sustainable supply chain management in emerging economies: environmental turbulence, institutional voids and sustainability trajectories", *International Journal of Production Economics*, Vol. 167, pp. 156-169.

Simonin, B.L. (1999), "Ambiguity and the process of knowledge transfer in strategic alliances", *Strategic Management Journal*, Vol. 20 No. 7, pp. 595-623.

Slater, S.F. and Narver, J.C. (1995), "Market orientation and the learning organization", *Journal of Marketing*, Vol. 59 No. 3, pp. 63-74.

Son, I., Lee, D., Lee, J.N. and Chang, Y.B. (2014), "Market perception on cloud computing initiatives in organizations: an extended resource-based view", *Information & Management*, Vol. 51 No. 6, pp. 653-669.

Song, H. and Chatterjee, S.R. (2010), "Achieving global supply-chain competitiveness: evidence from the *Chinese auto component sectors", Chinese Management Studies*, Vol. 4 No. 2, pp. 101-118.

Song, H. and Wang, L. (2010), "Does inter-firm learning and trust promote firm innovativeness?", *Frontiers of Business Research in China*, Vol. 4 No. 2, pp. 262-282.

Spekman, R.E., Jr, Kamauff, J.W.K. and Myhr, N. (1998), "An empirical investigation into supply chain management: a perspective on partnerships", *Supply Chain Management: An International Journal*, Vol. 3 No. 2, pp. 53-67.

Spekman, R.E., Spear, J. and Kamauff, J. (2002), "Supply chain competency: learning as a key component", *Supply Chain Management: An International Journal*, Vol. 7 No. 1, pp. 41-55.

Squire, B., Cousins, P.D., Lawson, B. and Brown, S. (2009), "The effect of supplier manufacturing capabilities on buyer responsiveness", *International Journal of Operations & Production Management*, Vol. 29 No. 8, pp. 766-788.

Srivastava, M.K. and Gnyawal, D.R. (2011), "When do relational resources matter? Leveraging portfolio technological resources for breakthrough innovation", *Academy of Management Journal*, Vol. 54 No. 4, pp. 797-810.

Subramanian, A.M., Bo, W. and Kah-Hin, C. (2018), "The role of knowledge base homogeneity in learning from strategic alliances", *Research Policy*, Vol. 47 No. 1, pp. 158-168.

Sweeney, E., Evangelista, P. and Passaro, R. (2005), "Putting supply chain learning theory into practice: lessons from an irish case", *International Journal of Knowledge and Learning*, Vol. 1 No. 4, pp. 357-372.

Szulanski, G. (2015), "Exploring internal stickiness: impediments to the transfer of best practice within the firm", *Strategic Management Journal*, Vol. 17 No. S2, pp. 27-43.

Tachizawa, E.M. and Thomsen, C.G. (2005), "Drivers and sources of supply flexibility: an exploratory study", *International Journal of Operations & Production Management*, Vol. 27 No. 10, pp. 1115-1136.

Tachizawa, E.M. and Wong, C.Y. (2015), "The performance of green supply chain management governance mechanisms: a supply network and complexity perspective", *Journal of Supply Chain Management*, Vol. 51 No. 3, pp. 18-32.

Teece, D., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.

Thakkar, J., Kanda, A. and Deshmukh, S.G. (2011), "Mapping of supply chain learning: a framework for SMEs", *The Learning Organization*, Vol. 18 No. 4, pp. 313-332.

Theodorakopoulos, N., Ram, M., Shah, M. and Boyal, H. (2005), "Experimenting with supply chain learning (SCL): supplier diversity and ethnic minority businesses", *The International Entrepreneurship and Management Journal*, Vol. 1 No. 4, pp. 461-478.

Toni, A.F.D., Nonino, F. and Pivetta, M. (2011), "A model for assessing the coherence of companies' knowledge strategy", *Knowledge Management Research & Practice*, Vol. 9 No. 4, pp. 327-341.

Tranfield, D., Denyer, D. and Smart, P. (2003), "Towards a methodology for developing evidence-informed management knowledge by means of systematic review", *British Journal of Management*, Vol. 14 No. 3, pp. 207-222.

Tse, Y.K., Zhang, M.H., Akhtar, P. and Macbryde, J. (2016), "Embracing supply chain agility: an investigation in the electronics industry", *Supply Chain Management: An International Journal*, Vol. 21 No. 1, pp. 140-156.

Vachon, S. and Klassen, R.D. (2006), "Extending green practices across the supply chain: the impact of upstream and downstream integration", *International Journal of Operations & Production Management*, Vol. 26 No. 7, pp. 795-821.

Van Hoof, B. (2014), "Organizational learning in cleaner production among mexican supply networks", *Journal of Cleaner Production*, Vol. 64 No. 64, pp. 115-124.

Verwaal, E., Verdu, A.J. and Recter, A. (2008), "Transaction costs and organisational learning in strategic outsourcing

relationships", *International Journal of Technology Management*, Vol. 41 No. 1/2, pp. 38-54.
Wernerfelt, B. (1984), "A resource-based view of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171-180.
Williams, S. (2007), "A supplier development programme: the SME experience", *Journal of Small Business and Enterprise Development*, Vol. 14 No. 1, pp. 93-104.
Willis, G., Genchev, S.E. and Chen, H. (2016), "Supply chain learning, integration, and flexibility performance: an empirical study in India", *The International Journal of Logistics Management*, Vol. 27 No. 3, pp. 755-769.
Wittstruck, D. and Teuteberg, F. (2012), "Understanding the success factors of sustainable supply chain management: empirical evidence from the electrics and electronics industry", *Corporate Social Responsibility and Environmental Management*, Vol. 19 No. 3, pp. 141-158.
Wu, Z. and Choi, T.Y. (2005), "Supplier–supplier relationships in the buyer–supplier triad: building theories from eight case studies", *Journal of Operations Management*, Vol. 24 No. 1, pp. 27-52.
Wu, Z., Choi, T.Y. and Rungtusanatham, M.J. (2010), "Supplier–supplier relationships in buyer–supplier–supplier triads: implications for supplier performance", *Journal of Operations Management*, Vol. 28 No. 2, pp. 115-123.
Wynstra, F., Spring, M. and Schoenherr, T. (2015), "Service triads: a research agenda for buyer–supplier–customer triads in business services", *Journal of Operations Management*, Vol. 35, pp. 1-20.
Xu, D., Huo, B. and Sun, L. (2014), "Relationships between intra-organizational resources, supply chain integration and business performance", *Industrial Management & Data Systems*, Vol. 114 No. 8, pp. 1186-1206.
Yan, T.T. and Nair, A. (2016), "Structuring supplier involvement in new product development: a China-US study", *Decision Sciences*, Vol. 47 No. 4, pp. 589-627.
Yang, C.C. (2016), "Leveraging logistics learning capability to enable logistics service capabilities and performance for international distribution center operators in Taiwan", *The International Journal of Logistics Management*, Vol. 27 No. 2, pp. 284-308.
Yang, C.F. and Lai, C.S. (2012), "Relationship learning from organizational knowledge stores", *Journal of Business Research*, Vol. 65 No. 3, pp. 421-428.
Yang, H., Zheng, Y. and Zhao, X. (2014), "Exploration or exploitation? Small firms' alliance strategies with large firms", *Strategic Management Journal*, Vol. 35 No. 1, pp. 146-157.
Yang, J., Yu, G.S., Liu, M.Y. and Rui, M.J. (2016), "Improving learning alliance performance for manufacturers: does knowledge sharing matter?", *International Journal of Production Economics*, Vol. 171 No. Part 2, pp. 301-308.
Yao, Y.L., Dong, Y. and Dresner, M. (2012), "Supply chain learning and spillovers in vendor managed inventory", *Decision Sciences*, Vol. 43 No. 6, pp. 979-1001.
Yazdanparast, A., Manuj, I. and Swartz, S.M. (2010), "Co-creating logistics value: a service-dominant logic perspective", *The International Journal of Logistics Management*, Vol. 21 No. 3, pp. 375-403.
Yeh, Y.-P. (2016), "Critical influence of relational governance on relationship value in strategic supply management", *European Business Review*, Vol. 28 No. 2, pp. 137-154.
Yoo, S.J., Sawyerr, O. and Tan, W.L. (2016), "The mediating effect of absorptive capacity and relational capital in alliance learning of SMEs", *Journal of Small Business Management*, Vol. 54, pp. 234-255.
Yu, C.M.J., Liao, T.J. and Lin, Z.D. (2006), "Formal governance mechanisms, relational governance mechanisms, and transaction-specific investments in supplier–manufacturer relationships", *Industrial Marketing Management*, Vol. 35 No. 2, pp. 128-139.
Yu, W.T., Jacobs, M.A., Salisbury, W.D. and Enns, H. (2013), "The effects of supply chain integration on customer satisfaction and financial performance: an organizational learning perspective", *International Journal of Production Economics*, Vol. 146 No. 1, pp. 346-358.
Yu, Y. and Sharma, R.R. (2016), "Dancing with the stars: what do foreign firms get from high-status local partners?", *Management Decision*, Vol. 54 No. 6, pp. 1294-1319.
Zhang, H.-Y. and Lv, S. (2015), "Intellectual Capital and technological innovation: the mediating role of supply chain learning", *International Journal of Innovation Science*, Vol. 7 No. 3, pp. 199-210.
Zhao, Y. and Wang, G. (2011), "The impact of relation-specific investment on channel relationship performance: evidence from China", *Journal of Strategic Marketing*, Vol. 19 No. 1, pp. 57-71.
Zhu, Q., Krikke, H. and Caniëls, M.C.J. (2018), "Supply chain integration: value creation through managing inter-organizational learning", *International Journal of Operations & Production Management*, Vol. 38 No. 1, pp. 211-229.
Zollo, M. and Winter, S.G. (2002), "Deliberate learning and the evolution of dynamic capabilities", *Organization Science*, Vol. 13 No. 3, pp. 339-351.

Corresponding author

Zhiduan Xu can be contacted at: zhiduanx@xmu.edu.cn