The role of knowledge acquisition and knowledge exploitation in driving proactive environmental sustainability

Antony Paulraj (antony.paulraj@nottingham.edu.cn)
Department of Entrepreneurship, Marketing and Management Systems,
University of Nottingham Ningbo China

Constantin Blome
School of Business, Management and Economics,
University of Sussex, UK

Christopher Rajkumar
Department of Entrepreneurship and Relationship Management,
University of Southern Denmark, Denmark

Abstract

Firms are increasingly focusing on sustainable product and process designs so as to improve their environmental performance (Blome et al., 2014; Paulraj, 2011). Against this backdrop, this paper aspires to study the importance of knowledge acquisition and knowledge exploitation capabilities in driving proactive environmental sustainability practices in firms. Knowledge acquisition is recognized as a key capability that could result in developing sustainable product and process designs. Additionally, knowledge exploitation is recognized as a firm capability that could play a key moderating role along with knowledge acquisition in enabling sustainable product and process design.

Keywords: Sustainable design, knowledge acquisition, knowledge exploitation

Introduction

Sustainability along with environmental awareness are emergent topics within supply chain management (Blome et al., 2014; Dangelico et al., 2013; Vinodh and Rathod, 2010). In fact, firms are continuously experiencing demand to be sustainable from different supply chain partners (Blome et al., 2014; Riikkinen et al., 2017). More importantly, several firms also acknowledge the importance for accomplishing an environmentally sustainable manufacturing and/or business (Vinodh and Rathod, 2010). The underlying logic is that such capabilities could help them in achieving sustained competitive advantage (Paulraj, 2011; Ray et al., 2004; Vanpoucke et al., 2014).

Accordingly, firms strive to green their supply chains, products, and processes (Riikkinen et al., 2017). Largely, sustainability in a supply chain setting is much widely accepted to incorporate environmental-based decisions and activities in designing products and processes (França et al., 2017; Vinodh and Rathod, 2010). This

understanding about sustainable designs often lead to the development of proactive environmental management capabilities wherein firms begin to work with the environmental impacts of their processes, adopt measures in reducing waste in their process as well as product designs, and identify different ways to exploit business opportunities (França et al., 2017).

While many drivers of sustainable practices are proposed by scholars, this study adheres to the knowledge-based view and focuses on the importance of knowledge management capabilities in driving proactive environmental sustainability design practices. It forwards that knowledge management capabilities offer organizations the capability to respond to environmental change as well as to adapt to the changing market conditions (Singh and Dalcher, 2011). This is in line with recent studies that emphasize the necessity of promoting knowledge management capability which includes exploration, assimilation and exploitation of organization's knowledge both internally and externally in order to address the need to sustain capability-based advantage (Lewin et al., 2011). Against this backdrop, this paper specifically addresses the role of knowledge acquisition and knowledge exploitation in driving proactive as well as advanced environmental sustainability practices such as sustainable product and process designs within organizations.

The next section presents the theoretical grounding for the hypothesized model. This is followed by a description of the research method, discussion of the empirical findings as well as conclusions.

Theoretical background

Sustainable capabilities

The major objective of sustainable manufacturing is to ensure environmental friendly products and processes with minimal resources such as materials, water, energy, etc. and minimum waste (Arnette et al., 2014). A sustainable manufacturing will always result in products and processes that satisfy the requirements of the current as well as future market environment. In other words, sustainable production will minimize excess waste and usage of natural resources (raw materials and energy). One of the reasons for firms to choose sustainable design strategy is to limit the environmental impacts, thereby identify new innovative business models as well as techniques to sustain the overall growth of the firm (França et al., 2017; Riikkinen et al., 2017; Vinodh and Rathod, 2010). In other words, sustainable design practices spanning product as well as process aspects could have a profound impact on the environmental performance of firms.

Role of knowledge management capabilities in developing sustainable capabilities

The knowledge-based view (KBV), an extension of the resource-based view, focuses on the utilization of knowledge as the prime source for achieving competitive advantage (Barney, 1986; Felin and Hesterly, 2007; Grant, 1996; Kogut and zander, 1992; Nonaka, 1994; Spender 1996). However, the recent views on KBV claim that it is an organization's knowledge management capability that shapes the basis to achieve sustainable competitive advantage and increases the firm performance (Alavi and Leidner, 2001; Cui et al., 2005; Grant, 1996; Senaji and Nyaboga, 2011; Singh and Dalcher, 2011; Tseng, 2014; Tseng and Lee, 2014; Zhou et al., 2014).

Grant and Baden-Fuller (1995) define knowledge as a strategic resource that generates highest value when acquired and exploited within and between firms. Organizations must exploit their existing knowledge and create new knowledge that helps them to compete efficiently and position themselves in their current market. So as to achieve such capability, organizations should develop the ability to exploit current knowledge to

identify the value of new knowledge, assimilate it and implement it to build new knowledge and capabilities (Gold et al., 2001; Tseng and Lee, 2014).

Recent studies also emphasize the necessity of promoting knowledge management capability which includes exploration, assimilation and exploitation of an organization's knowledge both internally and externally to address the need to sustain capability-based advantage in their changing market environment (Lewin et al., 2011). Knowledge management capabilities consist of three interrelated processes: knowledge acquisition, knowledge conversion, and knowledge exploitation (Cook and Brown, 1999; Cui et al., 2005; Dawson, 2000; Gold et al., 2001; Hsu and Sabherwal, 2012; Nonaka, 1994; Singh and Dalcher, 2011; Tseng, 2014; Tseng and Lee, 2014; Zahra and George, 2002).

Knowledge management process starts with acquiring knowledge about the new opportunities, translating the knowledge into easily accessible form, and exploiting the interpreted knowledge to create value through these processes (Dawson, 2000; Hsu and Sabherwal, 2012; Singh and Dalcher, 2011; Zahra and George, 2002). The successful outcome of the three major processes mainly depends on how well organizations effectively and efficiently can perform them (Dawson, 2000). This paper specifically addresses the role of knowledge acquisition and knowledge exploitation in driving proactive environmental sustainability.

Knowledge acquisition relates to the degree to which an organization observes information resources from other organizations (Chang et al., 2015; Hora and Klassen, 2013; Jantunen, 2005; Tsang, 2002; Zhou et al., 2014). Paiva et al. (2008) states that the knowledge acquisition capability is a collection of processes and mechanisms for acquiring internal as well as external knowledge to develop explicit future competencies (Zhou et al., 2014). Since both internal and external sources of knowledge are significant factors for any organization in the knowledge acquisition process (Lopez and Esteves, 2012; Rusly et al., 2015), acquiring knowledge from internal and external sources is considered as an important capability as well as strategic element for reorganizing the knowledge to advance the firm strategies, thus achieving sustainability in their present market environment (Lavie, 2006; López-Sáez et al., 2010).

Knowledge acquisition brings in greater opportunities when all the resources and processes are available to integrate both new and existing knowledge, thereby generating new unique results (Nguyen et al., 2015; Tiwana and Mclean, 2005). Additionally, Chang et al. (2015) also recognizes knowledge acquisition capability as a key factor in pursuing sustainable opportunities (Chen et al., 2010; Cui et al., 2005; Lane et al., 2001; Zahra and George, 2002). Additionally, Chen et al. (2010) claims that this knowledge acquisition process helps firms to find distinct knowledge that is crucial to sustain their survival and competitiveness (Rusly et al., 2015). To sum up, knowledge acquisition plays a key role in achieving continuous knowledge demands and enables an organization to use their knowledge supply to identify active strategies to scan new knowledge – also sustainability related, thereby achieving sustainable competitive advantage (Chen et al., 2010; Lavie, 2006; Mesquita et al., 2008). Along similar vein, we also argue that in addition to enabling proactive sustainability design capabilities, knowledge acquisition could subsequently enhance the impact that such capabilities could have on eventual environmental performance of firms.

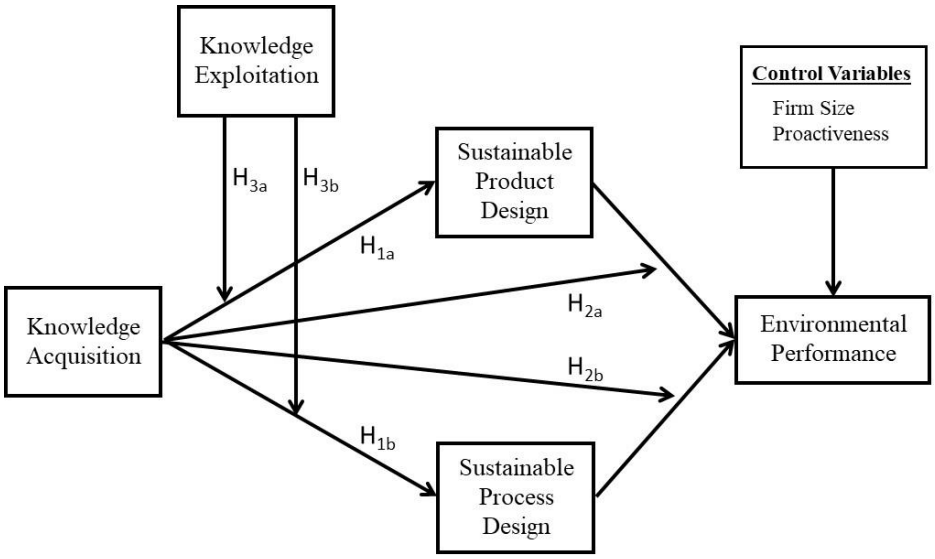
Once an organization acquires internal or external knowledge, it is important that this knowledge is exploited to realize the related benefits. Exploitation is a learning process in which the organization identifies existing knowledge that can be refined continuously and reused to increase the efficiency of the knowledge supply as well as to solve persisting problems (He and Wong, 2004; Sherif et al., 2013). Similarly, Zahra and George (2002) refer knowledge exploitation as an organizational capability that allows firms to create

new competencies by refining, integrating and translating knowledge into actions (Liu, 2006; March, 1991; Van Den Bosch et al., 1999).

Darr et al. (1995) says that knowledge exploitation process largely depends on the organization's capability in dealing with the acquired knowledge. Knowledge exploitation supports the organization to acquire explicit competences, to protect the knowledge from imitation and in turn to enhance their long-term objectives (Grant, 1996; Teece et al., 1997). However, the importance is still on refining and advancing existing practices or knowledge base. Therefore, knowledge exploitation can be considered as a key element in meeting the needs of the market by leveraging the existing knowledge to achieve competitive advantage (Benner and Tushman, 2003; Grant, 1996; Dröge et al., 2003; Jansen et al., 2006). More importantly, Kuratko et al. (2005) establish that active knowledge exploitation will help organizations to strategize their own knowledge base as well as increase their value by contributing to what is important to them.

In order to achieve sustainable competitive advantage, either knowledge acquisition or knowledge exploitation alone is not enough; instead, organizations should possess equal capability in both the knowledge acquisition and knowledge exploitation processes. By balancing, both knowledge acquisition and exploitation the organization ensures continuous growth (He and Wong, 2004; Smith and Tushman, 2005). To conclude, it is important that knowledge acquisition is exploited effectively to achieve competitive advantage (Yli-Renko et al., 2001).

Based on the above theoretical discourse, this paper firstly evaluates the direct effect of knowledge acquisition on sustainable design which includes both product and process design aspects. Subsequently, this paper evaluates the moderating effect of knowledge acquisition as well as knowledge exploitation. In other words, we test the following three hypotheses in our paper. The theoretical model along with the hypothesized direct and moderation relationships are presented below:



Direct effect of knowledge acquisition on sustainable design

H_{1a}: Knowledge acquisition from suppliers will have a positive effect on sustainable product design.

H_{1b}: Knowledge acquisition from suppliers will have positive effect on sustainable process design.

Moderating effect of knowledge acquisition

H_{2a}: Knowledge acquisition from suppliers will positively moderate the effect of sustainable product design on environmental performance.

H_{2b}: Knowledge acquisition from suppliers will positively moderate the effect of sustainable process design on environmental performance.

Moderating effect of knowledge exploitation

H_{2a}: Knowledge exploitation capabilities of a firm will positively moderate the effect of knowledge acquisition on sustainable product design.

H_{2b}: Knowledge exploitation capabilities of a firm will positively moderate the effect of knowledge acquisition on sustainable process design.

Methodology

Data Collection

Before data collection, the survey instrument was pretested using supply chain practitioners as well as academicians. A total of eight experts commented on the readability, appropriateness and completeness of the survey instrument (Dillman, 2007). The final instrument included a few minor changes based on the suggestions made by these experts. All measurement indicators in this study were measured using a 5-point Likert scale with strongly disagree and strongly agree as end-points.

Our study involved data collected from German and US manufacturing firms. As the questionnaire included firm-specific, relationship-specific and supply chain specific factors we sampled individuals holding strategic positions within the purchasing function at the firm level. The respondents were instructed to answer the supplier-related indicators with regard to their top one or two suppliers, based on dollar amounts and importance of materials purchased.

In Germany, the initial sample consisted of 1,400 firms. This sample was randomly drawn from Linkedin and Xing Groups focusing on sourcing and procurement (overall more than 16,000 group members). These groups were chosen in order to generate a sample that contains a high number of executives of sufficient seniority and knowledge to answer the survey. In order to avoid any group specific bias we merged the two groups and dropped double entries. As the survey was conducted in German, a rigorous process of translation and back-translation was employed to enhance the reliability of the scales. Data collection was accomplished using an electronic survey. Multiple emails were sent, soliciting individuals' participation, which were followed up by telephone calls. Overall 259 usable responses were received in Germany, representing a response rate of 18.5 %.

In the USA, the sampling frame was provided by the Institute for Supply Management (ISM). Since ISM does not give out the email addresses of its members, the survey was conducted in two stages. In the first stage, we mailed a consent form along with a cover letter explaining the project to 1500 respondents randomly selected from the sampling frame of 3000. A total of 580 respondents returned their consent form. But only 305 of these 580 respondents consented to participate in our study. The other 275 declined to participate giving reasons such as company policy as well as lack of experience. The interested participants were given the option to select how they will complete the survey. While some of them chose to receive the paper version of the survey, majority of the respondents completed an electronic version of the survey. A total of 241 completed surveys were received, resulting in an effective response rate of 20%. In total, we received a total of 500 responses (from Germany and USA).

As part of our survey, the respondents were also asked to answer questions assessing their (1) knowledge relating to the survey questions and (2) their level of confidence in

answering the questions. The average answer of 3.97 and 4.04 for these questions (on a 5 point Likert scale with endpoints of 1 = 'not at all' and 5 = 'significantly') suggest that they were suitable to answer the questions posed in our survey instrument.

We used multiple methods to assess the data for non-response as well as common methods bias; these analyses suggest that non-response as well as common methods bias are not an issue in our study.

Measures and validation

The dataset was initially assessed for the assumption of constant variance, existence of outliers as well as normality. The Mardia's (1970) test for multivariate normality showed that the Mardia coefficient for this dataset (1.00) was well within the recommended limits (-1.96 and 1.96). Further assessment of plots as well as statistics indicated that all assumptions were satisfied. The construct validity, discriminant validity, as well as reliability of the constructs in our hypothesized model were assessed using multiple rigorous techniques (Fornell and Larcker, 1981). Discriminant validity was established by comparing the squared correlation between two latent constructs to their average variance extracted (AVE) (Fornell and Larcker, 1981). None of the squared correlations was higher than the AVE for each individual construct; so we can safely conclude that the theoretical constructs exhibit discriminant validity. The results of the measurement instrument development process is presented in Table 1; this table also provides the indicators (questions) that were used to measure the different theoretical constructs. As is evident from this table, the results from our instrument development process indicate that the theoretical constructs are reliable, valid, as well as uni-dimensional.

Results and discussion

The hypothesized model was evaluated using hierarchical regression models. The direct effect of knowledge acquisition on sustainable product design and sustainable process design were both found to be significant. Hypotheses H_{2a} and H_{2b} focused on the moderating role of knowledge acquisition. The results for these hypotheses were mixed; while knowledge acquisition was found to moderate the effect of sustainable process design on environmental performance, it was not found to moderate the effect of sustainable product design on environmental performance. As for the moderating effect of knowledge exploitation, we found both the moderation effects to be insignificant.

Given that the majority of the moderation effects were insignificant, we conducted additional post-hoc analysis to shed better light on the moderation effects. Specifically, following Preacher et al. (2007), we estimated the conditional indirect effects of the impact of knowledge acquisition and knowledge exploitation using the moderated mediation appoach. The significance of these conditional indirect effects were evaluated using the bootstrapping approach employing 1500 bootstrap replications (Preacher et al., 2007). The bias corrected confidence intervals of these conditional indirect levels indicate that the moderating effects are significant only at higher levels of knowledge acquisition and knowledge exploitation.

In general, our results suggest that firms need to realize the importance of knowledge management when pursuing proactive sustainable practices. Also, knowledge acquisition alone cannot help in developing sustainable design (product and process). On the contrary, firms should be consistent in focusing on both knowledge acquisition and knowledge exploitation capabilities. In a nutshell, firms should acquire knowledge within the firm and supply chain and the acquired knowledge should be exploited effectively in driving proactive and advanced environmental sustainability practices.

Table 1: Measurement Instrument Development

Indicator *(Composite Reliability, Average Variance Extracted)*	**Std. Loading**
Knowledge Acquisition *(CR = 0.91; AVE = 0.66)*	
We view this supplier as a source of technical information.	0.78
We get valuable amount of information on industry trends from this supplier.	0.80
We get valuable technical know-how related to the supplier products.	0.89
We obtain a tremendous amount of technical know-how from this supplier.	0.83
There is strong willingness to learn successful practices of this supplier.	0.74
Knowledge Exploitation *(CR = 0.89; AVE = 0.66)*	
Our organization emphasizes the utilization and exploitation of…	
techniques.	0.82
know-how, patent, and new product design.	0.82
newly introduced advanced technologies.	0.80
techniques, equipment, and establishment.	0.81
Sustainable Product Design *(CR = 0.85; AVE = 0.53)*	
When designing products, we pay attention to reduced consumption of material/energy.	0.72
When designing products, we pay attention to reuse, recycle, and/or recovery of material.	0.83
We design our products to use environmentally friendly materials.	0.83
We design our products with standardized components to facilitate reuse.	0.64
We design our products for easy disassembly.	0.58
We use life cycle analysis to evaluate the environmental impacts of our products.*	
We have formal guidelines for environmental product design.*	
Sustainable Process Design *(CR = 0.92; AVE = 0.69)*	
The design of our processes is heavily dependent on sustainability goals.	0.79
We evaluate our existing processes to reduce their impact on the environment.	0.83
We have formal design for environment guidelines for process design.	0.81
We constantly reengineer our processes to reduce their environmental impact.	0.89
We improve the environmental-friendliness of our production.	0.82
Environmental Performance *(CR = 0.89; AVE = 0.56)*	
Reduction in air pollution.	0.77
Reduction in waste (water and/or solid).	0.83
Decrease in consumption of hazardous/harmful/toxic materials.	0.75
Decrease in frequency for environmental accidents.	0.64
Increase in energy saved due to conservation and efficiency improvements.	0.76
Decrease in use of natural resources.	0.75

Note: All indicators were significant at the $p < 0.01$ level

Conclusion

Given that environmental sustainability is becoming an increasingly important aspect of supply chain management, companies need to develop proactive practices to stay ahead of the competition. The furthest along such proactive practices could be the incorporation of environmental sustainability aspects into the product and process design. Realizing the importance of these two capabilities, we focus on the knowledge-based capabilities that could help companies to enhance their proactive environmental practices as well as environmental performance. Specifically, we highlight the importance of knowledge acquisition and knowledge exploitation capabilities in driving sustainability design of products and processes.

We used extensive survey data collected from Germany and USA to test our hypotheses. Analysis of this data reveals that knowledge acquisition is important in

developing sustainable product and process design. On the other hand, the moderating effects of knowledge acquisition and knowledge exploitation were mixed. Additional post-hoc conditional effects analysis indicate that there are specific situations within which knowledge acquisition and exploitation could have significant positive moderating effects on the development of sustainable product and process design as well as their impact on sustainability performance.

While we believe that our paper addresses the key role that knowledge acquisition and knowledge exploitation could play in driving proactive environmental sustainability practices, we believe that our study does have some limitations that could provide opportunities for future research efforts. First, we consider only knowledge acquisition and knowledge exploitation capabilities in our manuscript; we encourage future research to consider other aspects of knowledge management in driving proactive sustainability practices. Second, even though we took design as well as methodological efforts to minimize common methods bias, data on practices and performance measures were collected from a single respondent; future research could validate our results using data collected from multiple respondents. Finally, we focused on evaluating the effect on environmental performance, it is also important to see how the factors considered impact economic as well as social performance measures. Therefore, we recommend future research to take a triple bottom line approach towards performance measurement. In spite of these limitations, we believe that our study makes sufficient contribution on literature focusing on proactive sustainability practices and their impact on performance.

References

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. MIS quarterly, 107-136.

Arnette, A. N., Brewer, B. L., & Choal, T. (2014). Design for sustainability (DFS): the intersection of supply chain and environment. Journal of cleaner production, 83, 374-390.

Barney, J. B. (1986). Organizational culture: can it be a source of sustained competitive advantage?. Academy of management review, 11(3), 656-665.

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. Academy of management review, 28(2), 238-256.

Blome, C., Paulraj, A., & Schuetz, K. (2014). Supply chain collaboration and sustainability: a profile deviation analysis. International Journal of Operations & Production Management, 34(5), 639-663.

Chang, J., Bai, X., & Li, J. J. (2015). The influence of leadership on product and process innovations in China: The contingent role of knowledge acquisition capability. Industrial Marketing Management, 50, 18-29.

Chen, A. N., Hwang, Y., & Raghu, T. S. (2010). Knowledge Life Cycle, Knowledge Inventory, and Knowledge Acquisition Strategies*. Decision Sciences, 41(1), 21-47.

Cook, S. D. N., and J. S. Brown. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. Organization Science 10, no. 4:381-400.

Cui, A. S., Griffith, D. A., & Cavusgil, S. T. (2005). The influence of competitive intensity and market dynamism on knowledge management capabilities of multinational corporation subsidiaries. Journal of International Marketing, 13(3), 32-53.

Dangelico, R. M., Pontrandolfo, P., & Pujari, D. (2013). Developing sustainable new products in the textile and upholstered furniture industries: role of external integrative capabilities. Journal of Product Innovation Management, 30(4), 642-658.

Darr, E. D., Argote, L., & Epple, D. (1995). The acquisition, transfer, and depreciation of knowledge in service organizations: Productivity in franchises. Management science, 41(11), 1750-1762.

Dawson, R. (2000). Knowledge capabilities as the focus of organizational development and strategy. Journal of Knowledge Management, 4(4), 320-327.

Dillman, D.A. (2007), Mail and internet surveys: The tailored design method. John Wiley & Sons.

Dröge, C., Claycomb, C., & Germain, R. (2003). Does knowledge mediate the effect of context on performance? Some initial evidence. Decision Sciences, 34(3), 541-568.

Felin, T., & Hesterly, W. S. (2007). The knowledge-based view, nested heterogeneity, and new value creation: Philosophical considerations on the locus of knowledge. Academy of Management Review, 32(1), 195-218.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", Journal of Marketing Research, Vol. 18 No. 1, pp. 39-50.
França, C. L., Broman, G., Robèrt, K. H., Basile, G., & Trygg, L. (2017). An approach to business model innovation and design for strategic sustainable development. Journal of Cleaner Production, 140, 155-166.
Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. Journal of management information systems, 18(1), 185-214.
Grant, R. M. (1996). Toward a knowledge-based theory of the firm. Strategic management journal, 17(S2), 109-122.
Grant, R. M., & Baden-Fuller, C. (1995, August). A knowledge-based theory of inter-firm collaboration. In Academy of Management Proceedings (Vol. 1995, No. 1, pp. 17-21). Academy of Management.
He, Z. L., & Wong, P. K. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. Organization science, 15(4), 481-494.
Hora, M., & Klassen, R. D. (2013). Learning from others' misfortune: Factors influencing knowledge acquisition to reduce operational risk. Journal of Operations Management, 31(1), 52-61.
Hsu, I., & Sabherwal, R. (2012). Relationship between intellectual capital and knowledge management: An empirical investigation. Decision Sciences,43(3), 489-524.
Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. Management science, 52(11), 1661-1674.
Jantunen, A. (2005). Knowledge-processing capabilities and innovative performance: an empirical study. European Journal of Innovation Management, 8(3), 336-349.
Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. Organization science, 3(3), 383-397.
Kuratko, D. F., Hornsby, J. S., & Bishop, J. W. (2005). Managers' corporate entrepreneurial actions and job satisfaction. The International Entrepreneurship and Management Journal, 1(3), 275-291.
Lavie, D. (2006). Capability reconfiguration: An analysis of incumbent responses to technological change. Academy of management review, 31(1), 153-174.
Lewin, A. Y., Massini, S., & Peeters, C. (2011). Microfoundations of internal and external absorptive capacity routines. Organization Science, 22(1), 81-98.
Liu, W. (2006). Knowledge exploitation, knowledge exploration, and competency trap. Knowledge and Process Management, 13(3), 144-161.
Lopez, V.W.B. and Esteves, J. (2012), "Acquiring external knowledge to avoid wheel re-invention", Journal of Knowledge Management, Vol. 17 No. 1, pp. 87-105.
López-Sáez, P., Emilio Navas-López, J., Martín-de-Castro, G., & Cruz-González, J. (2010). External knowledge acquisition processes in knowledge-intensive clusters. Journal of Knowledge Management, 14(5), 690-707.
March, J. G. (1991). Exploration and exploitation in organizational learning. Organization science, 2(1), 71-87.
Mardia, K.V. (1970), "Measures of multivariate skewness and kurtosis with applications", Biometrika, Vol. 57 No. 3, pp. 519-530.
Mesquita, L. F., Anand, J., & Brush, T. H. (2008). Comparing the resource-based and relational views: knowledge transfer and spillover in vertical alliances. Strategic Management Journal, 29(9), 913-941.
Nguyen, B., Yu, X., Melewar, T. C., & Chen, J. (2015). Brand innovation and social media: Knowledge acquisition from social media, market orientation, and the moderating role of social media strategic capability. Industrial Marketing Management, 1-15.
Nonaka, I. (1994). A dynamic theory of organizational knowledge creation.Organization science, 5(1), 14-37.
Paiva, E. L., Roth, A. V., & Fensterseifer, J. E. (2008). Organizational knowledge and the manufacturing strategy process: a resource-based view analysis. Journal of Operations Management, 26(1), 115-132.
Paulraj, A. (2011). Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. Journal of Supply Chain Management, 47(1), 19-37.
Preacher, K.J., Rucker, D.D., & Hayes, A.F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. Multivariate Behavioral Research, 42(1), 185-227.
Ray, G., Barney, J. B., & Muhanna, W. A. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. Strategic management journal, 25(1), 23-37.
Riikkinen, R., Kauppi, K., & Salmi, A. (2017). Learning Sustainability? Absorptive capacities as drivers of sustainability in MNCs' purchasing. International Business Review. 26 (2017) 1075–1087.
Rusly, F. H., Sun, P. Y. T., & Corner, J. L. (2015). Change readiness: creating understanding and capability for the knowledge acquisition process. Journal of Knowledge Management, 19(6), 1204-1223.
Senaji, T., & Nyaboga, A. B. (2011). Knowledge management process capability: operations strategy perspective. International Journal of Management & Information Systems (IJMIS), 15(3), 147-158.

Sherif, K., Tsado, L., Zheng, W., & Airhia, B. (2013). An exploratory study of organization architecture and the balance between exploration and exploitation of knowledge. VINE: The journal of information and knowledge management systems, 43(4), 442-461.
Singh S. B., & Dalcher, D. (2011). Developing knowledge management capabilities: a structured approach. Journal of Knowledge Management, 15(2), 313-328.
Smith, W. K., & Tushman, M. L. (2005). Managing strategic contradictions: A top management model for managing innovation streams. Organization science, 16(5), 522-536.
Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. Strategic management journal, 17, 45-62.
Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic management journal, 18(7), 509-533.
Tiwana, A., & Mclean, E. R. (2005). Expertise integration and creativity in information systems development. Journal of Management Information Systems, 22(1), 13-43.
Tsang, E. W. (2002). Acquiring knowledge by foreign partners from international joint ventures in a transition economy: Learning-by-doing and learning myopia. Strategic management journal, 23(9), 835-854.
Tseng, S. M. (2014). The impact of knowledge management capabilities and supplier relationship management on corporate performance. International Journal of Production Economics, 154, 39-47.
Tseng, S. M., & Lee, P. S. (2014). The effect of knowledge management capability and dynamic capability on organizational performance. Journal of Enterprise Information Management, 27(2), 158-179.
Van Den Bosch, F. A., Volberda, H. W., & De Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. Organization science, 10(5), 551-568.
Vanpoucke, E., Vereecke, A., & Wetzels, M. (2014). Developing supplier integration capabilities for sustainable competitive advantage: A dynamic capabilities approach. Journal of Operations Management, 32(7), 446-461.
Vinodh, S., & Rathod, G. (2010). Integration of ECQFD and LCA for sustainable product design. Journal of Cleaner Production, 18(8), 833-842.
Yli-Renko, H., Autio, E., & Sapienza, H. J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. Strategic management journal, 22(6-7), 587-613.
Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. Academy of management review, 27(2), 185-203.
Zhou, K. Z., Zhang, Q., Sheng, S., Xie, E., & Bao, Y. (2014). Are relational ties always good for knowledge acquisition? Buyer–supplier exchanges in China. Journal of Operations Management, 32(3), 88-98.