

Knowledge sharing, knowledge transfer and SMEs: evolution, antecedents, outcomes and directions

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Postprint / Postprint

Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:

Anand, A., Muskat, B., Creed, A., Zutshi, A., & Csepregi, A. (2021). Knowledge sharing, knowledge transfer and SMEs: evolution, antecedents, outcomes and directions. *Personnel Review*. <https://doi.org/10.1108/PR-05-2020-0372/full/html>

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Please cite as: Anand, A., Muskat, B., Creed, A., Zutshi, A. Csepregi, A., (2021).

Knowledge Sharing, Knowledge Transfer and SMEs: Evolution, Antecedents, Outcomes and Directions.
Personnel Review. forthcoming, doi: 10.1108/PR-05-2020-0372

Access here: <https://www.emerald.com/insight/content/doi/10.1108/PR-05-2020-0372/full/html>

Knowledge Sharing, Knowledge Transfer and SMEs: Evolution, Antecedents, Outcomes and Directions

Purpose: The purpose of this paper is to systematically synthesize the extant literature of knowledge sharing (KS) and knowledge transfer (KT) in the small and medium enterprise (SME) context and to contribute with predictions of emerging themes.

Design/methodology/approach: Applied is a systematic literature review using three bibliometric techniques: 1) Textual analysis for keywords and abstracts to identify the research hotspots; 2) Co-citation analysis of references to identify the evolution of KS and KT in SME; and 3) Bibliographic coupling analysis of documents to synthesize antecedents and outcomes.

Findings: A conceptual map emerges from the review to reveal the antecedents of KS and KT at individual, group, and organizational levels. The analysis shows the strategic importance of KS and KT for the SME context. Specific findings include: 1) KS and KT are involved in enhancing SMEs strategic focus for human resources including, organizational learning, customer relations, creativity, higher profit and positive effects on operational processes and decision-making. 2) Innovation, trust, and performance are identified as central human factors linked to KS and KT in SMEs. 3) Human resource management research could contribute to KS and KT in the SME domain by exploring KS and KT based practices, linking the emergence of innovation and innovative behaviors to these practices, leading to a better understanding of strategies that enable the long-term storage and retrieval of tacit and explicit knowledge as organizational memory in the SME context.

Originality/value: This paper is the one of the first to systematically review KS and KT in SMEs and propose a concept map. The research adds value to the growing literature of KS and KT and exposes the need for more specific activities to support SME managers, as well as HR managers, who need to facilitate KS and KT in SMEs.

Keywords: Knowledge sharing, knowledge transfer, knowledge management, SMEs, bibliometric analysis, systematic literature review, VOSviewer

Introduction

Knowledge is one of the main resources of organizations and is critical to their long-term performance. Scholars have studied various types of knowledge, which have been categorized based on context, process, and usage (Sergeeva and Andreeva, 2016; Tangaraja *et al.* 2016). Although the extant literature on knowledge sharing (KS) and knowledge transfer (KT) is mostly focused on large organizations, in recent years, scholars have emphasized that the small to medium enterprise (SME) context (Thorpe *et al.* 2005; Eze *et al.* 2013; Massaro *et al.* 2016; Serenko and Bontis, 2013) must also be studied because KS and KT have a direct impact on both SME growth and the economy of a country (Anand and Dalmasso, 2019). Successful implementation of KS and KT is a key to SME innovation capability (Baker and Yusof, 2016; Vajjhala and Vucetic, 2013). Thorpe *et al.* (2005) laid the first groundwork using a systematic review of knowledge management in SMEs and narrowing it to a regional context. Subsequent reviews involved partial and specialized coverage of SME concepts within larger studies of general knowledge management (e.g. Wang and Noe, 2010). The earlier reviews made good consolidation of past literature with a narrow SME focus or, more often, a large organization emphasis (Ibrahim and Heng, 2015; Zheng 2017).

For this paper, we will converge from two pathways building upon the existing reviews conducted on KS and KT. *First*, we design a descriptive and predictive study of KM in SMEs. Other KS and KT literature reviews are identified in specific industries, such as, health care (Mitton *et al.* 2007; Pentland *et al.* 2011) and SME's (Zheng 2017) using a general structured approach to incorporate further specificity. *Second*, we surface a range of literature reviews conducted with different methodologies, such as, structured (Durst and Edvardsson 2012), pre-defined structured review (Massaro *et al.* 2016) and meta-analysis, from one journal source (that is, *The Journal of Knowledge Management*, see Asrar-ul-Haq and Anwar's, 2016). Each indicates a need for future studies to fully describe and justify the methodological approach for epistemological and ontological consistency.

Thus, the aim of this research is to systematically synthesize the extant literature of KS and KT in the SME context and to contribute with predictions of emerging themes. In doing so, our review builds upon existing studies (see Thorpe *et al.* 2005) using transparent and auditable bibliometric methods. While there has been a plethora of literature analysis techniques, such as, narratives structured reviews, and meta-analyses (Grant and Booth, 2009), the challenge for each one lies in making the literature organized, useful, readable and understandable (Zupic and Cater, 2015). Using complementary bibliometric techniques, such as, co-citation analysis of references and bibliographic coupling of publications, this paper contributes by systematically synthesizing the extant literature of KS and KT in the SME context and predicts emerging themes through a concept map (see Figure 7) of the antecedents, outcomes and future directions of KS and KT in SME research. The methodological rigor of bibliometrics enables the observations to be quantified and thus less distorted by cognitive bias of researchers (Anand *et al.* 2020). The next sections present the research design with a detailed methodology, then the results of the research are presented, followed by discussions, the concept map, and future implications.

Methodology

We implemented the step-by-step methodology of a systematic literature review using the suggestions of Tranfield *et al.* (2003), and Cerchione and Esposito (2016). Transparency and reproducibility are facilitated in this section by disclosing each stage in detail (Torchia and Calabrò, 2019).

Stage I: Database selection for the search: To extract the literature, Elsevier's Scopus database was adopted for its user-friendly sorting and ranking features (Boyle and Sherman, 2006; Mongeon and Paul-Has, 2016).

Stage II: Identifying keywords, subject area and constructing search strings: A keyword search using various combinations was performed on the Scopus database to extract publications. The inclusion criteria for selecting publications were determined as the subject codes, business, management, and accounting, and other disciplines were excluded by focusing only on business and management studies fields. The details of the search string and the data extracted are represented in Appendix 1.

Stage III: Inclusion and exclusion criteria: We selected only peer-reviewed academic journal publications, omitting conference papers, book chapters, and books following suggestions of Thyer (2008) and Adams *et al.* (2017). This resulted in a total of 194 article extractions between 1998 to 2018, and to be able to compare the different studies, selecting and discerning relevant themes was crucial. The authors read the abstracts applying professional judgement for inclusion and exclusion of publications. Abstracts provide concise overview of the research (Andrade, 2011) and are a standard gateway into the research literature for the scientific community (Cross and Oppenheim, 2006). After analyzing the abstracts, publications were selected based on, a) the context in which KS and KT were addressed in SMEs, b) the level of analysis (whether KS and KT was studied from the individual, group, organization, and/or network perspective in SMEs) and, c) theoretical framework/lens (whether KS and KT in SMEs had been explored from any general theoretical perspective).

Stage IV: Selection of review methods to examine literature: We conducted a comprehensive review using bibliometrics, as successfully applied in other studies (for example, Zupic and Cater, 2015). The benefit of a systematic review using bibliometric analysis comes in revealing the evolution and trends in a specific field of research (Walsh and Renaud, 2017). Bibliometric analyses (BA) are often combined with mapping tools and techniques to analyze the literature (Ponce and Lozano, 2010). To visualize our bibliometric data, we adopted science mapping software, Visualization of Science Viewer or VOSviewer¹ (Van Eck and Waltman, 2010). The diffusion speed of VOSviewer is faster than other software (Pan *et al.* 2018, Walsh and Renaud, 2017) adding to ease of use for conducting a literature review. Figure 1 depicts the typical flow-chart with the steps used in BA and science mapping via VOSviewer.

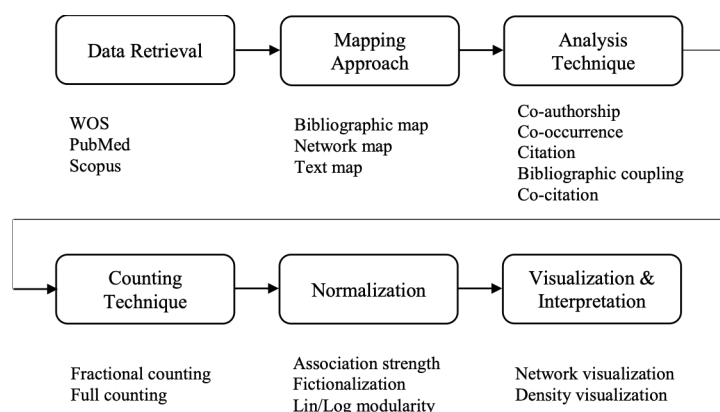


Figure 1: VOSviewer flow-chart explaining the steps involved in analysis

¹ <http://www.vosviewer.com/>

In the first step, we performed a textual analysis with 194 publications. Co-occurrences were identified by VOSviewer when two keywords appeared in the same paper; each keyword representing a unique research topic or directions within a subject area (Chen *et al.* 2006). Keyword co-occurrence can effectively reflect the research ‘hotspots’ in a discipline, providing auxiliary support for scientific research (Liao *et al.* 2018), since keywords reflect the document’s core content (Zhang *et al.* 2016). In VOSviewer, we then selected the category *overlay visualization*, which displayed the keywords used significantly over a period of time. For instance, although studies adopted the keywords since 1998, the software defaulted to the range in which the keywords started to occur higher (2006-2016, see Figure 3) and excluded the under-occurrence, thus representing a set of keywords being more active or emerging.

As part of step two, we performed Co-Citation Analysis of Reference (CCA-R) considering references as units of analysis. Hence, two references authored by the same person were differentiated and co-citation frequencies represented the proximities of two references (Córdoba *et al.* 2012; Renaud *et al.* 2016). CCA-R provided a perspective on the history of a research field (or domain or subdomain) as it investigated the references cited by the selected publications (Walsh and Renaud, 2017). VOSviewer showed that the 194 publications contained 9,774 citations. When faced with such a large sample size, we followed the suggestion by Waltman and van Eck (2013) and Walsh and Renaud (2017) to determine a cut-off point and select the most influential papers. Thus, we included only those papers that had been cited at least 5 times (Table 1 and Figure 4) and, subsequently, 10 cited references out of 9774 were selected that met the threshold

In the third and final step, we conducted Bibliometric Coupling Analysis of Documents (BCA-D), taking publications as the unit of analysis. In cases where two papers (A and B) had both cited paper C, BCA-D linked papers A and B, even though they might not have directly cited each other. The more references papers A and B had in common, the stronger their relationship. BCA-D thus helped shift “the focus of analysis from past traditions to current trends” (Vogel and Güttel, 2013: 426). To perform BCA-D analysis, we used all 194 publications in our database published since 1998. However, we established a cut-off point in VOSviewer, of the number of citations of publications being a minimum of five. Thus, out of 194 publications we found 88 publications that met the threshold and VOSviewer computed them into clusters for analysis. We read all of the 88 abstracts and found 43 papers relevant for our study. The inclusion of publications was based on the following criteria: a) papers that explicitly addressed the concept of KS, KT or KE in the context of SMEs, and b) papers that addressed KS, KT or KE from organizational, group and/or individual level in SMEs.

Upon completion of the computer-aided analyses, we systematically synthesized the results obtained from both CCA-R and BCA-D and adopted a qualitative coding procedure (Anand *et al.*, 2020). For CCA-R, data was manually coded for each abstract. In cases of inconsistencies, we read the paper in detail. For BCA-D, we read each abstract, took notes, and coded the content into five different categories: 1.) context, 2.) variables, 3.) methodologies, 4.) antecedent/consequences, and 5.) outcomes. The results were presented as a matrix (see Appendix 2). We chose this visual format to organize the information in a logical order, which included topics common to authors or publications, methodological similarities and differences, measurement tools (experiments, narrative inquiry, quantitative methods, qualitative or mixed method, etcetera), and level of analysis (that is, individual, group and organizational).

Results and Discussion

Text analysis of keywords

Figure 2 presents the results in the form of a keyword co-occurrence network. Overall, VOSviewer identified 782 keywords in all 194 publications. Of these, 30 met the co-occurrence threshold², indicating that the minimum number of occurrences of these words is at least five. The review crystallized the 30 keywords; the color-coding marks the different years. To interpret these maps, we followed Walter and Ribierie (2013) who suggested observing a general pattern emerging from all keywords. The keyword ‘knowledge transfer’ (KT) was the most popular in SME research in 2006–2010, followed by ‘knowledge sharing’ (KS) around 2012. The trend between 2012-2016 indicated that studies included the keywords ‘knowledge creation’ and ‘performance’. The bubbles on the map represent a term that was found more than 5 times. The bigger the bubble, the higher the term’s occurrence scores, and the closer the circles are to one another, the more often the terms occurred together, then the thicker the line connecting them, the more significant were the co-occurrences. The color represents the co-occurrence of words grouped into clusters (Perianes-Rodriguez *et al.* 2016).

Notably, some significant terms, such as, ‘knowledge exchange’ and ‘organization memory’, that is, the result of a business’s learning process (Muskat and Deery, 2017), did not emerge in this keyword map. The mapping also revealed that the keywords, ‘innovation’ and ‘trust,’ in the context of SMEs were mostly used between 2008 and 2012. Our data revealed growing attention in SME research to the keyword ‘social capital’. Since 2015, this term became increasingly linked to ‘universities’ and ‘knowledge sharing’. ‘Knowledge creation’ and ‘performance’ were emerging keywords (2012 and 2014), and we observed case studies becoming the most recent methodological trend in SME KS research.

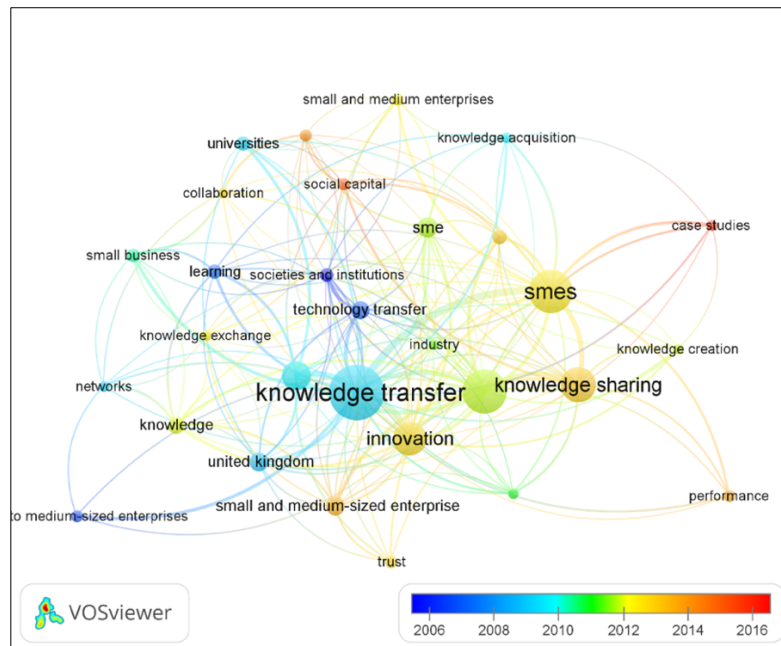


Figure 2: Keyword co-occurrence map

² The final 30 keywords were selected from the threshold value set in the VOSviewer software, which determines the weight.

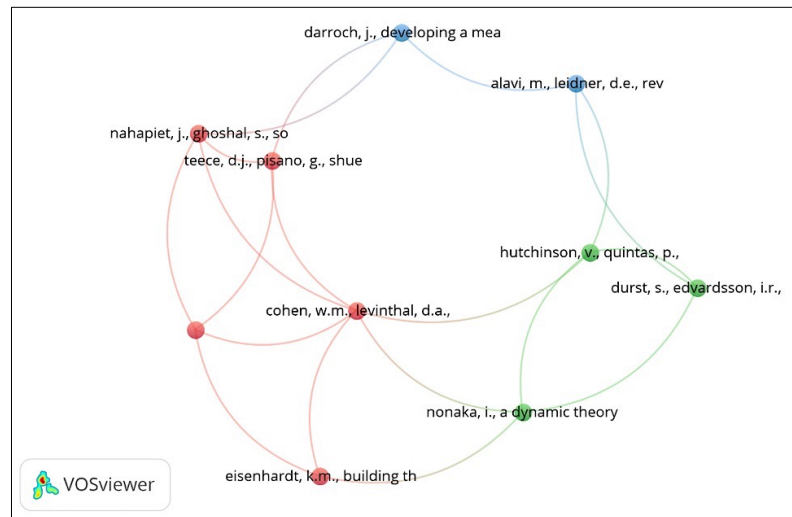


Figure 3: CCA-R-author mapping

Co-Citation Analysis of References (CCA-R)

In this section we present the results extracted from CCA-R (Co-Citation Analysis of References). Figure 3 resulted from citation analysis and shows how authors are linked via their citations. The color of the bubble and lines connects the three clusters with author details with which the paper is associated. To create the network, we used the smart local moving (SLM) algorithm as our cluster analysis method (Waltman and van Eck, 2013). The thickness of the lines indicated the strength of co-citation ties. The link and proximity between two publications determined their co-citation relationship. The results revealed three major clusters (red, blue and green), and each cluster indicated the link between the authors' paper citations. Table 1 provides further details of the publications that are identified as seminal works. These publications are grouped into clusters by VOSviewer based on close proximity between the citations, along with author names, journal details. With our author mapping analysis, we identified the following publications as seminal papers to explain the evolution of KS and KT. Many researchers had been referencing and building new theories based on these publications. The implication is that these studies should not be overlooked by any literature review when researching the theme of knowledge sharing.

Cluster	Citations	Journals
Red	Cohen and Levinthal (1990)	<i>Administrative Science Quarterly</i>
Red	Eisenhardt (1989)	<i>Academy of Management Review</i>
Red	Hansen (1999)	<i>Administrative Science Quarterly</i>
Red	Nahapiet and Ghoshal (1998)	<i>Academy of Management Review</i>
Red	Teece <i>et al.</i> (1997)	<i>Strategic Management Journal</i>
Green	Durst and Edvardsson (2012)	<i>Journal of Knowledge Management</i>
Green	Hutchinson and Quintas (2008)	<i>International Small Business Journal</i>
Green	Nonaka (1994)	<i>Organization Science</i>
Blue	Alavi and Leidner (2001)	<i>MIS Quarterly</i>
Blue	Darroch (2003)	<i>Journal of Knowledge Management</i>

Table 1: CCA-reference – clusters of seminal texts

Clustering seminal papers of KS and KT in SMEs

Based on CCA-R-author mapping analysis, the identified seminal papers in Table 1 are grouped into three clusters.

Cluster Red – Knowledge as competitive advantage

Cluster Red (05 publications) synthesizes publications that discuss knowledge as a competitive advantage for SMEs. Knowledge plays a vital role in employee interpersonal relations (Cohen and Levinthal, 1990; Hansen, 1999; Teece *et al.* 1997). KS is central to KM, and antecedents that have influence on KS include social capital (Nahapiet and Ghoshal, 1998), strength of ties (Hansen, 1999), absorptive capacity (Cohen and Levinthal, 1990), and dynamic capability (Teece *et al.* 1997). Social capital is a component of KS and derived from multiple levels, including the individual, organizational and sub-unit levels (Hansen, 1999). KT also occurs between organizational units. Cohen and Levinthal (1990), found that an entity limited in both absorptive capacity and prior related knowledge is less likely to see the value of new knowledge. Teece *et al.* (1997) assert that organizations must strategize to find alternative ways of creating and producing new knowledge. In this cluster, the role of building theories with case study research is cited more frequently (Eisenhardt, 1998).

Cluster Green – Managing and transferring knowledge in SMEs

Cluster Green (03 publications) synthesizes research conducted on KM and KT and how it helps in knowledge creation (KC) in the SME context. KT has been identified as a fundamental need for KC and an integrated process within KM. Hutchinson and Quintas (2008) assert that SMEs do not have formal KM processes and, hence, are likely to adopt informal processes. Through literature review, Durst and Edvardsson (2012) highlighted that three areas of KM, knowledge management implementation, knowledge management perception, and KT, are well researched in the context of SMEs; However, other topics, like knowledge identification, knowledge storage or retention, and knowledge utilization, are under-researched. There is also a need for country comparisons, cross-sectional and mixed method studies (Hutchinson and Quintas, 2008). Furthermore, the dynamics of knowledge creation rely on Nonaka's (1994) socialization-externalization combination-internalization (SECI) paradigm. Nonaka (1994) suggested that knowledge creation is measured by the amount of time spent by employees on a specific task.

Cluster Blue – Behaviors and measures of knowledge in SMEs

Cluster Blue (02 publications) synthesizes behavioral concepts and measures associated with KS, KT, KC, KM, KM systems, and knowledge storage. The analysis shows that these have been addressed in the context of information, ideas, and expertise (Alavi and Leidner, 2001), as well as knowledge dissemination, responsiveness to knowledge, and knowledge acquisition (Darroch, 2003). In organizations, KS and KT are dependent on how well tacit knowledge is shared between individuals with support from information technology (Darroch, 2003). Alavi and Leidner (2001) distinguish between KS and KT and identify them as parts of the process and perspective of disseminating knowledge throughout the organization. Essentially, KT occurs between individuals, from individuals to explicit sources, from individuals to groups, between groups, across groups, and from groups to the organization. In terms of measurement, Darroch (2003) explored KM practices and behaviors through empirical studies of knowledge acquisition, knowledge dissemination, and responsiveness to knowledge in customer and market settings.

Bibliographic coupling of publications (BCA-D)

We now present results from BCA-D and show how the 194 publications are interlinked by citations and centrality of authors in the bibliographic network. We analyzed the textual data beyond the evolution and

explored emerging trends in a field. The network map from VOSviewer in Figure 4 shows the publications clustered into distinct colors. The higher the weight of an item, the larger the label and the circle of the item. The color of an item is determined by the cluster (Figure 4) to which the item belongs, and lines between items represent links. In general, the closer two publications are located to each other, the stronger their relatedness (Van Eck and Waltman, 2017). The more cited references shared by two publications, the closer their relationship.

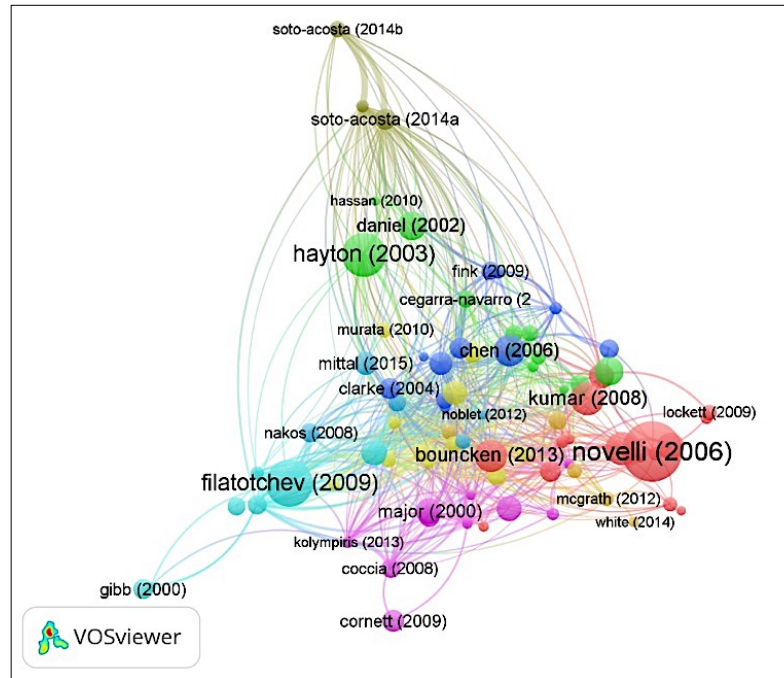


Figure 4: BCA-D map

Clustering emerging trends in KS and KT in SME research

This section identifies trends in KS and KT research in SMEs by using the BCA-D map along with the qualitative coding from the fourth step of our methodology (see Appendix-2) to recognize emerging trends. This synthesis generates the six clusters depicted in Figure 5).

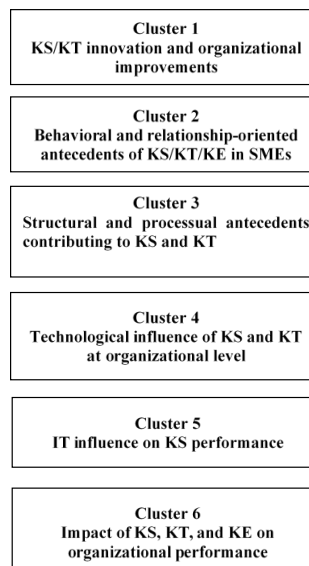


Figure 5: BCA-D clusters – emerging trends in the field

Cluster 1 – KS/KT innovation and organizational improvements

Cluster 1 (14 publications) combines KS and KT as an antecedent to innovation for SMEs (Bouncken and Kraus, 2013). Studies of KS discussed individual roles (Wee and Chua, 2013) and relationships (Noblet and Simon, 2012) as well as interpersonal aspects such as mutual trust and respect (Wee and Chua, 2013). Studies that identify KT as an antecedent of innovation suggest networking (Carlisle *et al.* 2013), individual know-how (Butler *et al.* 2007), social relationships (Edwards, 2007), formal and informal relationships (Padilla-Meléndez *et al.* 2013) trust, and strength of ties (Butler *et al.* 2007) being effective KT mechanisms for individuals.

Organization-level studies link KS and innovation (Carlisle *et al.* 2013) with a number of antecedents, such as, the implementation of policy norms (Bjerregaard, 2010; Lockett *et al.* 2009) and reward and recognition (Padilla-Meléndez *et al.* 2013), while Wee and Chua (2013) confirm that SME owner-managers are the main drivers of KM activities. Studies adopting this organization-level perspective also linked SME innovation to physical workspaces (Wee and Chua, 2013), information systems (Wynn *et al.* 2009; Wynn, 2008), technology adoption (Harris, 2009), processual aspects (Edwards, 2007), and open innovation (Padilla-Meléndez, 2012). The consequences and outcomes of KS and KT for SMEs are manifold. The innovative capacity of SMEs is the consequence of effective KS and operational improvement in SMEs that comes from effective KT (White *et al.* 2014), and an overall increase in strategic focus (Lockett *et al.* 2009).

Cluster 2 – Behavioral and relationship-oriented antecedents of KS/KT/KE in SMEs

Cluster 2 (09 publications) synthesizes the major impacts of KS, KT, KE, and knowledge dissemination (KD) at the organizational level. Antecedents related to the individual level and included aspects, such as, a lack of understanding of KM (Anand *et al.* 2013), the network position of actors (Alawamleh and Popplewell, 2011), absorptive capacity, reliability of source (Cantú *et al.* 2009), and language and communication patterns (Shelton, 2001). At the organizational level, the antecedents of KS in SMEs are management support (Anand *et al.* 2013), management philosophy, and strategy governance (Coyte *et al.* 2012).

Examples of organization-level antecedents that lead to KS, KT, or KE include organizational culture, concrete sharing mechanisms, effective communication (Cantú *et al.* 2009), workplace training and coaching (Keogh *et al.* 2000), advice networks, and the proximity of the knowledge holder (Hughes *et al.* 2009). Keogh *et al.* (2000) and Fink and Ploder (2009) highlight how SME information technology enable the dissemination of knowledge to, and between employees. Examples of positive consequences of KS, KT, or KE for SMEs include improvements in operations, customer perceptions, communication, and general performance (Shelton, 2001). Alawamleh and Popplewell (2011) add that KS can avoid mistake repetitions and improve decision making within the network. This is in line with Anand *et al.* (2013), who assert that a lack of KS increases hindrances in the firm.

Cluster 3 – Structural and processual antecedents contributing to KS and KT

This cluster (12 publications) incorporates publications that discuss KS and KT from an organizational perspective. The antecedent of KS is self-efficacy (Mittal and Dhar, 2015) which is predicated by company size, company sector (Maes and Sels, 2014), formality (planned events, processes), and informality (unplanned activities) (Fletcher and Prashantham, 2011). Other publications in this cluster discuss governance mechanisms, such as, decision rights (Dimitratos *et al.* 2010) and KM tools to support KS and create virtual KS networks (Perez-Araos *et al.* 2007).

The individual antecedents of KT are visual management, or visualization for kaizen KT (Murata and Katayama, 2010), interorganizational relationships, and networks and social capital (Capo-Vicedo *et al.* 2011). Only one paper highlighted KE: O'Dwyer and O'Flynn (2005) suggested that the nature and type of knowledge exchanged in partner businesses determine the nature of KE activities, and tacit knowledge leads to high or low supplier appropriation concerns. As for the consequences, KS improves employee creativity (Mittal and Dhar, 2015) and increases exploratory and exploitative learning, along with product innovation (Maes and Sels, 2014). KS is also said to facilitate the shift from tacit knowledge to explicit knowledge (Perez-Araos *et al.* 2007).

Cluster 4 – Technological influence on KT/KE at organizational level

In this cluster (02 publications) the influence of KT and KE at both the individual and organizational levels is evident. Coccia (2008) discusses spatial distance as an antecedent of KT and concludes that when distance between the knowledge source and user increases, there is a negative effect and a decrease in KT. Technology partnering for successful KE depends on the nature and complexity of the product and project. However, strong collaboration can help to develop new know-how. Major and Cordey-Hayes (2000) presented a model of an integrated KT process, which they called knowledge translation. This process has implications for foresight processes, which relate to future implications of present actions.

Cluster 5 –IT influence on KS performance

This cluster (03 publications) deals with KS using quantitative methods and highlights the role of IT at an organizational level. Soto-Acosta *et al.* (2014) highlighted IT expertise and commitment-based HR practices (online KS) as organizational antecedents of KS, followed by IT expertise and commitment-based HR practices (web 2.0-based KS) and customer power (negative relationship with web 2.0-based KS). HR practices are also antecedents of KS (Hayton, 2003). However, the consequences are positive in this cluster including, for instance, improved entrepreneurial performance (Hayton, 2003), improved internal KS effects, and e-commerce adoption and associated benefits (Daniel and Wilson, 2002). Online KS also positively contributed to organizational innovation (Soto-Acosta *et al.* 2014).

Cluster 6 – Impact of KS, KT, and KE on organizational performance

This cluster (03 publications) relates to the combination of KS, KT, and KE in both qualitative and quantitative studies. Muent (1999) highlighted interpersonal relations as a significant individual antecedent of KT, followed by personal contracts as organizational antecedents. Filatotchev *et al.* (2009) discussed export propensity and export performance as organizational antecedents of KT, while Van Gils and Zwart (2004) suggested that strategic KS alliances have consequences for turnover, profit, and product range extensions.

To consolidate our findings from CCA-R and BCA-D and the qualitative analysis in this section, the paper now presents a qualitative concept map (Buter *et al.* 2006) of antecedents, outcomes and future directions of KS and KT research in the SME context (see Figure 6).

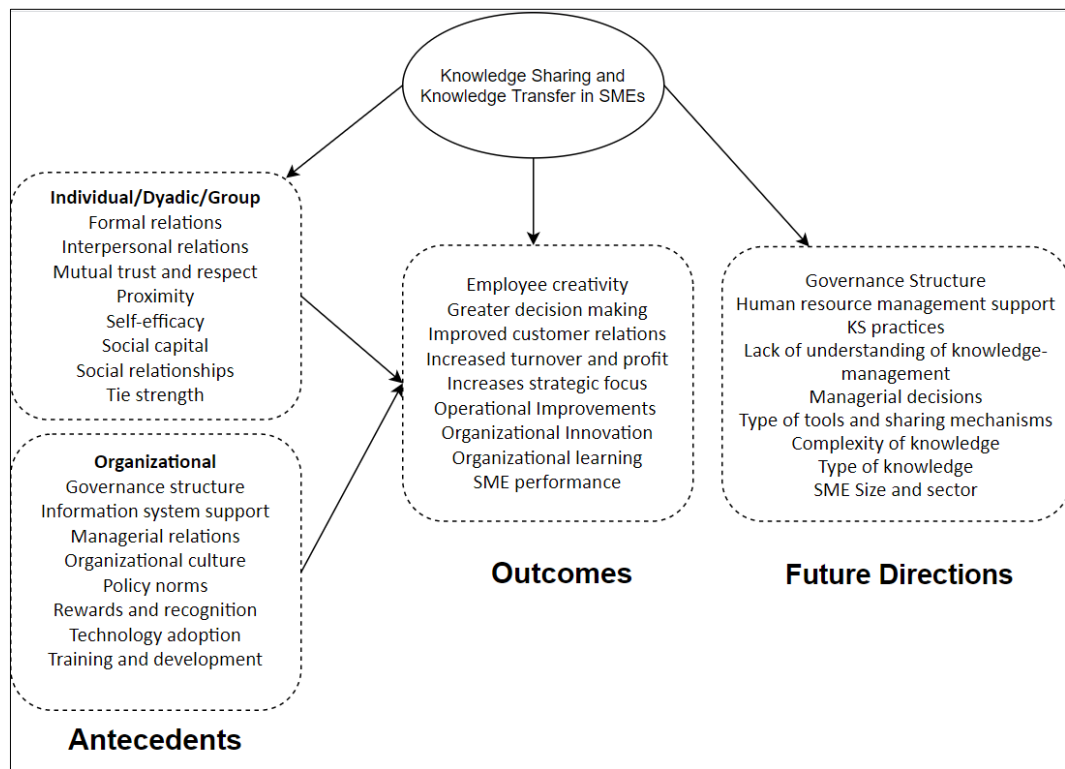


Figure 6: Qualitative concept map of the SME research agenda

Figure 6 depicts the evolution of the literature from foundational antecedents and outcomes toward future directions which, uniquely reveal themes bridging into HRM from the context of SMEs. Some of the focus topics of the past reflect once again in the future directions (for instance, governance structure) while a range of themes have evolved in new ways. The re-emergence of human resources factors, such as, support, sharing and training, are signs that SMEs, while grappling with KS and KT, are working in a more people-centric field, perhaps, as technological maturity occurs.

Contribution

The aim of this research was to systematically synthesize the extant literature of KS and KT in the SME context and to contribute with predictions of emerging themes. Accordingly, we developed a concept map (see Figure 6) of the antecedents, outcomes and future research directions of KS and KT in SME research. Next, we discuss these themes and show how our study contributes to advancing the existing literature in terms of 1) theoretical contributions, 2) methodological advancement of bibliometric literature reviews, 3) future research, and.

Theoretical contribution

To build upon Thorpe *et al* (2005), Serenko and Bontis (2013), Eze *et al* (2013), and Massaro *et al* (2016) we designed a descriptive and predictive study of KM in SMEs and converged a large range of other SME literature. Overall, our comprehensive review showed that the extant literature can be grouped into two sets of *antecedents* – one set of studies focus on understanding KS and KT on the individual level, and extending to group dynamics, (for example, aiming to better understand trust, respect, relationships, self-efficacy); the second set of studies focus on the organizational level (for instance, discussing cultural aspects, structure, rewards and recognition, policy norms, training, relations). SMEs owner-manager characteristics play a prominent role in leading KT and KS activities (Wee and Chua, 2013), therefore, it is necessary to identify the relevance of the individual level attributes, such as self-efficacy.

In terms of outcomes, prior research has shown that, for large organizations, KS and KT are essential drivers for innovation and growth (for example, Tsai *et al.* 2014; Wang and Noe, 2010). The review confirms the strategic importance of KS and KT for the SME context, along with other outcomes, such as, improved strategic focus and higher profit. We also found that, for the SME context, positive firm-level outcomes are diverse and include positive effects on operational processes and decision-making, organizational learning, creativity, as well as relational aspects, for example, customer relations. Since SMEs are typically more operation-oriented, less strategic, and more limited in resources (see Massaro *et al.*, 2016), business-owners might have more frequent, direct contact with their customers. Subsequently, we suggest the advantage that KS and KT brings to SMEs in customer relations and operational benefits should be the subject of further investigation.

Methodological contribution of bibliometric literature reviews

Our structured approach using bibliometric techniques for structured literature reviews was able to build significantly upon the groundwork of Thorpe *et al.* (2005). We highlighted how the CCA-R and BCA-D techniques can complement traditional interpretive and narrative techniques, and advanced meta-reviews. Our literature review created synthesis of knowledge enabling formation of a concept map (Figure 6) to establish an agenda to be addressed in future research.

We responded to the need for more rigorous systematic methodological approaches. Thus, our application of co-citation analysis of references (CCA-R) and bibliographic coupling analysis of publications (BCA-D) advanced prior research that studied the theme of KS using BA, citation analysis, co-citation author analysis, or meta-analysis (for example, Gu, 2004; Serenko and Dumay, 2015a, 2015b; Serenko and Bontis, 2013; Serenko *et al.* 2010; Walsh and Renaud, 2017). We provided transparency of methodology and adopted an approach that handled large volumes of text, reducing the time required for the process. Our work exists to help researchers identify contributions to knowledge and construct substantiated arguments about further

development of the field (Denyer and Tranfield, 2006). Ultimately, we have extended the existing literature reviews beyond specific knowledge management journals (Massaro *et al.* 2016; Serenko and Dumay, 2015b), instead adding multidisciplinary validity of the findings with a greater focus on indexed journals inclusive of HRM.

Future research

Evolving from our systematic exploration of the literature are clear directions for future research in the fields indicated in the concept map in Figure 6: Governance structure, HRM support, KS practices, lack of understanding of KM, managerial decisions, types of tools and sharing mechanisms, complexity of knowledge, type of knowledge, and SME size and sector. Many of these investigation fields involve essentially human issues and functions, which signal a shift from the technological bias of KS and KT. On the basis of the bibliometric analysis, we posit that HRM research could contribute in three particular areas for advancement of the understanding of behaviors related to KS and KT in the SME domain, namely: 1) understanding KS and KT based practices; 2) linking the emergence of innovation and innovative behaviors to these practices, and; 3) contributing to a better understanding of strategies that enable the long-term storage and retrieval of tacit and explicit knowledge and organizational memory in the SME context.

First, HRM researchers could explore practices, tools and mechanisms of KS and, consequently, design studies to better understand the interplay and impact on employee KS and KT behavior (see Kim *et al.* 2018) and for example on how to support SME staff and facilitate knowledge transfer during succession (see Muskat and Zehrer, 2017). Conceptually, a ‘strategy-as-practice’ perspective (Seidl and Whittington, 2014) could help with implementation of daily practices and improved understanding of how employees in SMEs apply KS and KT strategy in their localized contexts (Jarzabkowski, 2003).

Second, our findings strengthen the link between KS and KT, and innovation for the SME context. However, more research is required for understanding how KS and KT lead to successful innovation. Although, it is known that implementation of KS and KT is an integral part of SME innovation capability (Baker and Yusof, 2016; Vajjhala and Vucetic, 2013), there remain open questions about how to manage this implementation. We suggest that future research could investigate how information technology and digitalization foster KS and KT for SMEs, and successfully lead to innovation. Studies should investigate SME preferences of knowledge shared via online or face-to-face channels, and what digital competencies are needed to acquire new knowledge and implement innovation.

Third, there is a need to better understand how SMEs can receive and store their knowledge. There is an absence of research on organizational memory in SMEs. Thus, we posit there is another avenue specifically for HRM researchers, to explore the strategic significance of organizational memory. Research could explore how both tacit and explicit knowledge can be proactively captured, stored and retrieved so that SMEs can benefit from it in the long-term (Chang and Cho, 2008; Muskat and Deery, 2017).

Limitations

We acknowledge opportunities to extend this research in the light of some limitations. For example, arguably, bibliometric analysis is not the only type of literature review. Methods like SLR (Massaro *et al.* 2016), the interpretive approach (Renaud *et al.* 2016), and narrative approaches (de Geofroy and Evans, 2017; Muskat *et al.*, 2019) may also be applied to the existing literature. However, bibliometrics achieves synthesis of a field in a more scientific way using various sources through the Scopus database (Walsh and Renaud, 2017).

According to Walsh and Renaud (2017), bibliometric methods lack indicators for measuring quantity, quality, and connections between publications, which may limit the view of emergent, innovative themes in a research field. Thus, our study in its approach to overcoming this limitation, could be a benchmark for advancement in the field of KS through bibliometric analysis. Nevertheless, our analysis of keyword co-occurrence, abstracts and titles may contain some bias, as the sample is made up exclusively of journal publications, leaving out book chapters and conference papers.

The VOSviewer software limited the citation of journals using a fractional counting method, thus, other software, such as, Histcite, Pajek or SCiMat, may process data in slightly different ways for alternate perspectives (Gaviria-Marin *et al.* 2019; Zhou *et al.* 2018). Future studies may adopt a constructive classification method to emphasize emergent research trends in the domain of KS. A combination of direct citation analysis and BCA-D could be useful. By selecting and synthesizing abstracts, the chosen methodology may have missed some insights from full text analysis. Future researchers may proceed by coding and analyzing complete papers. Despite these limitations, our study comprehensively expands the understanding of KS and KT in SMEs.

Conclusion

Our research applied bibliometric analysis to systematically review the extant literature on KS and KT in SMEs to identify antecedents, outcomes and future research directions, which further helped us to develop a conceptual map. This paper is the first, to our knowledge, to adopt the structured approach using bibliometric techniques to study KS and KT in SMEs. The literature was analyzed using bibliometric techniques, such as, 1) ‘textual analysis’, identifying research emerging research hotspots and keywords such as, innovation, trust, and performance, which are key success factors in SMEs for effective KS and KT, 2) ‘co-citation analysis of reference’, identifying the theoretical foundations of knowledge as competitive advantage through KS and KT and, 3) ‘bibliographic coupling analysis of document’ revealing the antecedents and outcomes enabling us to show the research directions (see Figure 6).

The developed concept map can assist practitioners to understand the different roles KS and KT play in the unique context of SMEs, especially in aspects of organizational innovation and the improvement of relationships and organizational performance. We found, 1) KS and KT are involved in enhancing SMEs strategic focus for human resources including, organizational learning, customer relations, creativity, higher profit and positive effects on operational processes and decision-making. 2) Innovation, trust, and performance are identified as central human factors linked to KS and KT in SMEs. 3) Human resource management research could contribute to KS and KT in the SME domain by exploring KS and KT based practices, linking the emergence of innovation and innovative behaviors to these practices, leading to a better understanding of strategies that enable the long-term storage and retrieval of tacit and explicit knowledge as organizational memory in the SME context.

The overall findings are that HRM research could contribute to KS and KT in the SME domain by exploring KS and KT based practices, linking the emergence of innovation and innovative behaviors to these practices, and contributing to a better understanding of strategies that enable the long-term storage and retrieval of tacit and explicit knowledge and organizational memory in the SME context.

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Further reading

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Appendix 1: Keyword protocol (search string) used in Scopus for filtering publications.

Key Word Protocol or Search String used to identify articles from Scopus Database
(TITLE-ABS-KEY (<i>"Knowledge Shar*"</i> OR <i>"Shar* Knowledge"</i> OR <i>"Knowledge Transfer"</i> OR <i>"Transfer Knowledge"</i> OR <i>"Knowledge Exchange"</i> OR <i>"exchange knowledge"</i>)) AND (TITLE-ABS-KEY (<i>"SMEs"</i> OR <i>"SME"</i> OR <i>"Small and Medium Enterprises"</i> OR <i>"Small Business"</i>)) AND (LIMIT-TO (SRCTYPE , "j ")) AND (LIMIT-TO (DOCTYPE , "ar ")) AND (LIMIT-TO (SUBJAREA , <i>"BUSI"</i>))

Appendix 2: Matrix Sample for BCA-D Analysis

Citation Extracted in Scopus	cluster	Concept				Method			Impacted level that is investigated		
		KS	KT	KE	KD	Quali	Quanti	Review	Individual	Group	Organization
grimstad (2014)	1	√				√	√				
peruta (2014)	1						√				
white (2014)	1		√								
wee (2013)	1	√							√		
bouncken (2013)	1	√				√					
padilla-meléndez (2013)	1		√	√		√					√
carlisle (2013)	1		√			√			√		√
noblet (2012)	1	√			√			√			√
jaegersberg (2011)	1	√				√					√
butcher (2011)	1	√					√		√		√
bjerregaard (2010)	1			√		√					√
lockett (2009)	1		√			√					√
harris (2009)	1	√	√			√			√		
wynn (2009)	1		√			√					√
wynn (2008)	1		√			√					√
duh (2008)	1		√			√					√
butler (2007)	1		√								
edwards (2007)	1		√	√							
anand (2013)	2	√					√		√		√
coyte (2012)	2	√									
alawamleh (2011)	2	√						√			√
cantú (2009)	2		√				√				√
chen (2006)	2		√			√	√				√
clarke (2004)	2	√						√			√
fink (2009)	2				√		√				√
hughes (2009)	2		√			√	√			√	
jochem (2011)	2		√					√	√	√	√
keogh (2000)	2					√					√
sas (2009)	2		√			√			√		
shelton (2001)	2	√				√			√		√
murata (2010)	3		√				√			√	√
moreira (2009)	3	√				√					√
mittal (2015)	3	√					√		√		
mittell (2014)	3	√				√			√		
maes (2014)	3	√					√		√		√
mcadam (2014)	3						√				√
fletcher (2011)	3	√				√			√		√
hoffmann (2014)	3		√				√				√
dimitratos (2010)	3	√				√					√
capó-vicedo (2011)	3		√			√					√
perez-araos (2007)	3	√					√				√
o'dwyer (2005)	3			√		√			√		√
coccia (2008)	4		√				√		√		
major (2000)	4		√			√	√				√
beeckham (1998)	4			√		√	√		√		√
soto-acosta (2014a)	5	√					√				√
soto-acosta (2014b)	5	√					√				√
hayton (2003)	5	√					√				√
daniel (2002)	5	√					√				√
jonsson (2010)	6			√			√				√
filatotchev (2009)	6		√				√		√		√
van gils (2004)	6	√				√					√
muent (1999)	6		√			√			√		√