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Stakeholder engagement for innovation management and entrepreneurial development: A meta-analysis

Abstract

This paper reviews contemporary studies in entrepreneurship literature related to innovation management (IM), stakeholder engagement (SE), and entrepreneurial development (ED), using bibliometric techniques and longitudinal statistical analysis of 1059 articles published in the *Journal of Business Research* (JBR) and other relevant business and management journals indexed in Scopus from 1974 until July 2020. We have employed a structured literature review and meta-analysis to explore the emerging research patterns in prospective observational studies encompassing the field of ED, SE, and IM. Our findings suggest that dynamics of the interaction of SE, IM, and ED are shaping the scholarship of academic research in entrepreneurship. Our meta-analysis reaffirms that contemporary research conducted at the intersection of SE, IM, and ED indicates the consolidation of these tenets in future research in entrepreneurship leading to an integrative view. Finally, we present future research directions at the intersection of SE, IM, and ED for entrepreneurship research.

Keywords: Stakeholder engagement, stakeholder relationship, innovation management, entrepreneurship, entrepreneurial development, meta analysis.

Introduction

Globally, entrepreneurship development (ED) is a key tenet of research in entrepreneurship (Tayab et al., 2020). As countries try to carefully tread across the path of technological unemployment created by increased automation, machine learning, and artificial intelligence, there is more impetus on ED and self-sustaining enterprises. Based upon the level of socio-economic progress and technological development, each economy witnesses differing roles and economic impact played by entrepreneurship (Van Stel et al., 2005; Peredo & McLean, 2006). World Economic Forum (2018) also advocates strong and resilient private enterprises for sustained national competitiveness. As it is often said, necessity breeds innovation, high levels of entrepreneurial initiatives are often associated with countries where economic progress is on the slow track (Amorós & Cristi, 2008; Bruton et al., 2008). It thus becomes critically important to calibrate a systematic review of the literature using bibliometrics to identify the emerging patterns of research and scholarship in entrepreneurship development, this most important field of entrepreneurship research.

Realigning to the “new normal” phenomena caused by the novel coronavirus and the global pandemic calls for a relook at the ways enterprises innovate for new tactical and strategic product – market extensions and outreach (Kim & Huarng, 2011; Krishna & Kummitha, 2020). In a sense,

innovation can also be expressed as a key business activity to spur economic growth (Huarng, 2011; Wu, 2013). It is the intrapreneurial and entrepreneurial ecosystem that makes it a perfect haven to launch innovations in products and services to create value for all associated stakeholders, including companies, collaborators and customers (Lewis et al., 2002; Laforet, 2008; Dibrell et al., 2011; Wu, 2011; Parellada et al., 2011; Mousa & Wales, 2012). Notwithstanding the eminence of innovation management for entrepreneurial excellence (Greve, 2003, Huarng, 2011), a structured review of literature on the interdependence between innovation management (IM), entrepreneurial development (ED), and entrepreneurship is what we explore here through statistical analysis of literature and natural language processing, using computational bibliometrics.

There is considerable interest in stakeholder engagement (SE) in better managing innovation in entrepreneurial ventures. Freeman (1984) introduced the strategic importance of stakeholders for successful enterprises. Stakeholders are the *raison-de-êtr*e for enterprises' brand equity (Bresciani et al., 2013; Carvalho et al., 2014; Chang and Chen (2014); Chari and Dixit (2014); Contò et al., 2015; Kumar & Pansari, 2016; Kaufmann & Shams, 2015), new project, and product development (Aarikka-Stenroos et al., 2014; Ind et al., 2013; Kastanakis & Rhode, 2017; Voyer & Shams, 2016), and effectively creating, communicating, and delivering value for customers of a commercial enterprise (Huggins & Thompson, 2015; Kaufmann & Shams, 2015; Ramaswamy & Ozcan, 2016, 2018; Shams & Kaufmann, 2016). Proactive and effective SE builds an innovation climate in organizations, which leads the entrepreneurial venture to sustainable competitiveness (Gautam, 2017). In this context, this *Journal of Business Research's* (JBR) special issue on "innovation management and entrepreneurial development: the antecedent role of stakeholder engagement" aims to "contribute to our current understanding on how entrepreneurs could leverage their external and internal stakeholder networks for sharing knowledge and resources to plan and implement innovative entrepreneurial strategies collaboratively" (Correia Loureiro et al., 2019). The significance of SE has been well-acknowledged in past literature on entrepreneurship (Chesbrough, 2006; Mount & Martinez, 2014; Vargo & Lusch, 2004, 2011, 2016, 2017); therefore, a deterministic bibliometric review of the forward and backward linkages of SE-interfacing IM and ED have been examined for managerial insights and scholarly contribution to this immensely important field of research in entrepreneurship (Christofi et al., 2014, 2015, 2017).

Peter Drucker said, "Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or service" (Drucker, 1985, p. 28),

acknowledging further the fundamental role of entrepreneurs in business innovation management. Entrepreneurs' collaborative efforts of sharing knowledge from external sources, in general, underpin business and management innovation process (Chesbrough, 2006). Open innovation is defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006, p. 1). Therefore, the open innovation concept appears complementary to the entrepreneurs' prospective collaborative efforts with their external and internal stakeholders (Faems et al., 2005) in order to share knowledge and other resources for innovation management.

A "rewarding value-delivery process (that is generally an outcome of innovation management) does not rely solely on an organization's or its entrepreneur's inspired efforts. Stakeholders, the most important associates of a value-delivery network and their significant contributions, are certainly required for a win-win outcome" (Kaufmann & Shams, 2015, p. 10). In this essence, entrepreneurs recognize that they cannot depend solely on their in-house knowledge and resources to successfully plan, implement, and monitor the innovation processes in a way that could ensure their business offerings' sustainable competitive advantage (Bughin et al., 2008). Entrepreneurs' extant and embryonic stakeholder networks are a substantial source of capital that can increase entrepreneurs' success propensity (Smith & Lohrke, 2008) in innovation management to establish, maintain, and enhance a rewarding value delivery network for win-win outcomes for all involved stakeholders. Consequently, entrepreneurs should be aware of numerous issues, for example, where and how they and their stakeholders encounter challenges, mutually utilize opportunities, and (co-) create value through the collaborative innovation process (Kaufmann & Shams, 2015). The extant entrepreneurship literature acknowledges the significance of SE for IM and ED research and practice; "however, there is little (critical) research that explicitly links business models to...innovation strategies" (Saebi & Foss, 2015, p. 201) from the context of realizing "how entrepreneurial firms leverage network competence" (Yu et al., 2014, p. 687), in particular to plan, implement, and evaluate proactive win-win innovation strategies for IM and ED, in collaboration with key stakeholders.

An entrepreneur's initiative to engage with their stakeholders is however instrumental in identifying innovation opportunities; there is considerably less research on the contexts that are useful for entrepreneurs to influence their stakeholder networks to underpin innovation management, and also, there is further limited work on how entrepreneurs could inspire the relations between SE and

innovative entrepreneurial opportunity identification (Burns et al., 2014). For example, the “theories of entrepreneurship (that) most typically focus on characteristics specific to the individual (entrepreneur)” (Acs et al., 2013, p. 759) often ignore the possibilities of entrepreneurs’ stakeholder networks to explore and manage innovative entrepreneurial opportunities. Focusing on this major research gap related to SE, IM, and ED, Huggins and Thompson (2015) argued that “despite the growing acknowledgement that entrepreneurship is an important driver of innovation and growth, the role of the (stakeholder) networks in these processes has been less formally examined” (p. 103).

In recent years, scholars have further acknowledged the significance of SE to underpin IM and ED, and have also identified many areas where we need novel insights to underpin our knowledge. For example, in a recent study on human capital (HC), financial capital (FC), and social capital (SC, that is generally evolved from entrepreneurs’ stakeholder networks), Linder et al. (2020) argued that we need novel insights into “how HC creates functional SC for founders (of new ventures), especially how multiple forms of HC might be used to create multiple forms of SC” (p. 925), as well as to explore “what type of SC investment is particularly relevant for new venture survival” (p. 925). In another recent study on the impact of socioemotional wealth (SEW) on family firms, researchers argued that we need to “delve deeper into SEW conflicts in FOBs (family-owned businesses) by investigating conditions under which the combination of (innovative) value ascribed to SEWr (restricted socioemotional wealth) and SEWe (extended socioemotional wealth) changes” (Laffranchini et al., 2020, p. 205). In another study on signalling and social exchange for coachable entrepreneurs, Ciuchta et al. (2018) argued that “given that stakeholders often commit more than capital to a startup, they commonly stress how important it is for entrepreneurs to be ‘coachable.’ To date, however, coachability has received little attention in entrepreneurship research” (p. 860). In fact entrepreneurship researchers are concerned that

research on entrepreneurship has exploded over the past two decades, attracting worldwide attention. Showing greater rigor and creativity, this research has achieved greater academic legitimacy and approval. But much of this research goes unused (in practice) perhaps because it focuses more on what researchers want to study, rather than what our (an entrepreneur’s) different stakeholders care about. (Wiklund et al., 2019, p. 433)

Centring on this critical research gap on the antecedent role of SE in IM for ED, this introductory paper of this JBR special issue aims to undertake a meta-analysis at the intersection of SE, IM, and ED to understand the progress on the foremost themes and correlation (and dissimilar aspects)

among these three recognized, but under-researched concepts, of entrepreneurship research, and to recognize the embryonic research directions in this field.

Foundation of bibliometric studies in SE, IM, and ED

The focus of this section is to review contemporary studies in entrepreneurship literature related to SE, IM, and ED, using bibliometric techniques and longitudinal statistical analysis of 1059 articles published in the *Journal of Business Research* and other relevant business and management journals indexed with Scopus from 1974 until July 2020.

While preparing the template for bibliometric analysis of SE, IM, and ED, we observed that there are considerable journals in the field of entrepreneurship that publish findings in one or more fields of research interest. Our research, however, is only focused on articles in the *Journal of Business Research*. A preliminary review of the literature database in the JBR revealed 2147 articles on entrepreneurship published between 1974 and 2020. The United States of America, the United Kingdom, Spain, and India are the major countries contributing to entrepreneurial research (Chart 1).

(Chart 1)

Authors Wincent, J; Parida V; Kraus, S; Huarng, K H; and Ussahawanitchakit are the major contributors to entrepreneurial research, averaging 12 to 13 contributions each from 1974 until 2020 (Chart 2)

(Chart 2)

Theories and applications in Business and Management constitute over 80% of the studies on entrepreneurship as reflected from the Scopus database on JBR (Chart 3)

(Chart 3)

SE, IM, and ED are the key tenets of entrepreneurship, and considered the primary drivers to navigate the engine of economic progress. In pursuit of understanding the context and influence of SE, IM, and ED, we have attempted to study the trends and progress of scholarly research, by identifying the articles published in the JBR. We employed a structured literature review and meta-analysis to identify the emerging research patterns in prospective observational studies encompassing these three cognate fields of entrepreneurship research.

It is pertinent to mention that numerous studies have been published in the recent past, focusing on SE, IM, and ED as three sovereign areas of research in entrepreneurship. In this study, we went a step further to examine the self-determining role of SE, IM, and ED, using computational bibliometrics and data-visualization techniques.

Our research focused on a bibliometric study of 1059 articles from Scopus, for a deeper analysis of the evolution of literature on research in SE, IM, and ED in entrepreneurship research. Using a bibliometrics and data visualization framework, it was possible to efficiently analyze the entrepreneurship database of JBR while systematically reviewing the wide-ranging research in these three areas, thereby elucidating a structural foundation of the past, present, and future research directions in entrepreneurship research published in JBR.

The scientometric approach of bibliometrics is rooted in library science and information management literature, and is focused on the statistical analysis of bibliographic databases (Pritchard, 1969, Broadus, 1987). Bibliometric analysis ranges from the appraisal of the scientific impact of a publication, author, or journal based upon total or relative figures of citations and number of publications (Baier-Fuentes et al., 2019), employing the Hirsch Index or h-index (Hirsch, 2005), or the Journal Citation Reports (JCR) impact factor. With the data-visualization tool VosViewer®, the major identifiers used are citations; bibliographic coupling to find if two documents share a common reference, especially in short periods (Boyack & Klavans, 2010; Vogel & Güttel, 2013); and co-occurrences of words (Callon et al., 1983; Kessler, 1963, Vogel & Güttel, 2013; Zupic & Čater, 2015) to analyze the commonly occurring keywords in the articles on entrepreneurship. Also, co-citation (Small, 1973) has been used to identify the knowledge base in SE, IM, and ED literature.

This bibliometric study assessed articles published in JBR, since its inception. It is interesting to note that Ferreira published the first bibliometric study in JBR in 2014 on mergers and acquisitions research in top strategy and international business journals. Merigó (2015) published a bibliometric overview of the *Journal of Business Research* between 1973 and 2014.

A retrospective analysis of data collected showed that all 22 bibliometric studies mentioned in Table 1 were published in JBR by various authors from different countries. The matrix chart displays terms as nodes and shared records or correlations (depending on matrix type) as lines between them.

The matrix of Authors by Country (Fig. 1.) shows that Spain has the maximum number of scholarly publications in JBR with keywords as bibliometric, followed by Germany and Austria. The matrix shows the various authors who have contributed to the body of knowledge of bibliometric analysis in JBR and their linkages to various countries. This helps us understand how the bibliometric domain has evolved in JBR since its inception. The blue nodes represent the rows of the matrix which have author names; the brown nodes represent the columns with country names. Figure 2. illustrates the Matrix of Author Year by Author Keywords.

The analysis examines only bibliometric publications in JBR, and therefore, the results are limited to 22 publications published to date. This matrix and bubble graphs in Figure 3 offer insights and provide a starting point for the literature review of bibliometric analysis in JBR, and then progresses to the current research of SE, IM, and ED. Several bibliometric studies have been published in JBR, and several authors around the world have widely used bibliometrics to understand the origin and evolution of a discipline (Hérubel, 1999) and to complement and extend the results obtained using more traditional literature review techniques (Ramos-Rodríguez & Ruíz-Navarro, 2004, Seyedghorban et al., 2015).

The bubble map (Fig. 3) of Author vs Year shows that publications in JBR have increased exponentially with two publications in 2018, six publications in 2019, and seven publications in 2020. This shows the widespread use of bibliometric software, mostly VOSViewer, and citation/co-citation bibliometric outputs have been published in JBR. The bibliometric publications' topics in JBR are unique.

(Figure 1)
(Figure 2)
(Figure 3)
(Table 1)

The need for a bibliometric analysis

What determines SE, IM, and ED in entrepreneurship research? What are the emerging research trends in specific areas of SE, IM, and ED? Why do we need a review of these questions? What motivated us to undertake this research? Inspired by Leonidou et al. (2018) and Piñeiro-Chousa et al. (2020), the two classic expositions on an integrative framework of SE for IM and ED, we explain our motivation across key dimensions.

First, SE, IM, and ED (especially the latter two) are core concepts in traditional research in entrepreneurship (Canestrino et al, 2020; Ahmed et al, 2020; Albort-Morant et al, 2015; Alqahtani et al. 2015; Amjad et al, 2020; Edwards et al, 2020; Belso – Martinez, 2013; Bhupatiraju et al., 2012; Carlsson et al., 2013; Fagerberg et al., 2012; Landström et al., 2012; Martin et al., 2012). However, some of these streams originated in pure liberal arts and social sciences and not necessarily in pure-play business and management. The development of these concepts happened mostly in silos, necessitating researchers to take a look at an integrated view of the emerging discipline in entrepreneurship research.

Second, the connections and interfaces of SE, IM, and ED are considered the key to entrepreneurial success and growth. The interaction effects are prominently expressed in entrepreneurship and IM (Secundo et al., 2015; Crossan & Apaydin, 2010), and entrepreneurship and entrepreneurial development (Audretsch & Link, 2018; Galindo-Martín et al., 2016).

From this perspective, the investigation of the interfaces of SE, IM, and ED and complementarities fortifying associations among these three nodes of entrepreneurship research acquires special interest, particularly for the independent enterprise research in management sciences.

The bibliometric analysis of SE, IM, and ED aspires to discover how the three concepts in entrepreneurship are being considered in recent academic contributions in the *Journal of Business Research*.

As a meta-analytical and longitudinal form of research, bibliometrics can help researchers to understand the origin and evolution of a discipline (Hérubel, 1999), as well as complementing and extending the results obtained using more traditional literature review techniques (Ramos-Rodríguez & Ruíz-Navarro, 2004; Seyedghorban et al., 2015).

It examines the extant literature on entrepreneurship published in JBR since its inception. This exercise aids in a progressive understanding of the developmental patterns of research and in determining whether SE, IM, and ID are still developing as three distinct research domains today. This will also assist researchers to visualize the underlying rubric of evolving patterns of research in SE, IM, and ED in entrepreneurship research.

The bibliometric analysis broadly addresses the following research objectives:

1. to outline the existing research facing the intersection of SE, IM, and ED; identifying the most relevant authors, articles and journals, since inception, and visualizing frequent keywords and citations, using natural language processing.
2. to visualize and plot the networks or links among the dissimilar elements of SE, IM, and ED.
3. to distinguish the foremost themes underlying the SE, IM, and ED research frontage.
4. to investigate the scope and coverage of correlation or intra-dependence among the three concepts in entrepreneurship research.

Research methodology, article selection, and analysis

This section is concerned with the methodology, article selection, and analysis of the related research. A systematic review methodology, as illustrated in Figure 4, applies a specific protocol, to search and critically analyze existing literature. To address the research questions of this study, we identified several research articles published in JBR. We retrieved existing literature in JBR from Elsevier's Scopus database using keywords related to "Bibliometrics", "stakeholder engagement", "innovation management", and "entrepreneurship development". The keyword search in Scopus was set to include titles, abstracts, and keywords to retrieve all relevant publications. The search period was set to include articles published in JBR since its beginning. Only English-language publications were considered for the review process.

(Figure 4)

In Table 2, the initial database search revealed 1059 articles. The screening process resulted in a unique sample of 22 different researchers who published articles between 2014 and May 11, 2020 related to bibliometrics. The screening process resulted in a unique sample of 64 different researchers who published articles on IM and 184 articles on ED and 39 on SE.

(Table 2)

To realize our research focus, we conducted an exhaustive bibliometric analysis, involving both VantagePoint® based bibliometric performance analysis and VOSViewer® based analysis, using the Scopus database. Our computational bibliometric analysis focuses on articles on entrepreneurship with concentrations on SE, IM, and ED; authors; affiliated institutions; and geographies. The

VantagePoint® aided in text mining from literature databases to rapidly discover WHO, WHAT, WHEN, and WHERE, facilitating to clarify relationships and find critical patterns of the interconnectedness of SE, IM, and ED in the extant entrepreneurship literature. Graphical analysis with VosViewer® uses co-citation, bibliographic coupling, and co-occurrence of keywords. The results of both analyses are consistent. The bibliometric analysis plays an informative and complementary role, as it presents most of the key aspects of deep-lying feedforward and feedback interlinkages of SE, IM, and ED in mainstream entrepreneurial research. It is interesting to note that bibliometric methods involving a combination of VantagePoint® and VOSViewer® offer categorization and reproduction methods that can advance understanding of the dissemination of knowledge in revealing the contribution of SE, IM, and ED in entrepreneurship research, and can highlight gaps and opportunities that contribute to the advancement of the discipline.

In particular, we used VantagePoint® Academic Version: 2020 (Porter et al, 2020) and VOSViewer® version 1.6.15 (Van Eck & Waltman, 2010), released on April 1, 2020.

VantagePoint's® algorithm is a fuzzy matching technique used on combination term fields, composed of Title, Abstract, and Keyword fields, systematically processed using natural language processing. With a high degree of accuracy, the algorithm of VantagePoint®, within a given set of databases, can predict the growth in research attention in the field for the next two to five years. We have established clustering of emerging terms in SE, ED, and IM using VantagePoint's PCA (Principal Components Analysis) routine to generate appealing, well-comprehended developing research themes (Wang et al., 2019).

VOSViewer® software permits researchers to harmonize the visual analysis with tabulated information, which can be employed to calculate metrics for each network, such as density and degree. Density is defined as the ratio of the number of links in the network to the total possible number of links. Degree specifies the average number of links of the nodes included in the network (Arho, 2019; Vogel & Güttel, 2013). The higher the density and the degree the more is the interdependence and connectedness of the networks.

The size of the nodes is dependent upon the number of links to other nodes. The greater the proximity between the two nodes, or the greater the thickness of the line that links them, the stronger is the association between them (Waltman & Van Eck, 2019). In our analysis, we have

preferred the fractional counting route (Perianes-Rodriguez, Waltman, & Van Eck, 2016) in the data visualizations accomplished with the VOS Viewer® software.

Primarily we attempted to understand the relational networks and theoretical basis of stakeholder engagement's associative correlation with innovation management that leads to entrepreneurial development.

Bibliographic coupling

VOSviewer is a computer program that was developed for creating, visualizing, and exploring scientific bibliometric maps. (Castillo-Vergara et al., 2018). The VOSviewer results of bibliographic coupling describe the extent to which two articles are related by virtue of them both referencing the same article. Bibliographic coupling and network analysis to assess knowledge coalescence in a research center environment (Kessler, 1963; Porter, 2018).

The bibliographic coupling of ED in JBR is illustrated in Figure 5, of IM in Figure 6 and of SE in Figure 7. Colors indicate clusters of researchers that are relatively strongly related to each other. Large circles represent researchers that have many publications. Small circles represent researchers with only a few publications. In general, the closer two researchers are located to each other in the visualization the more strongly they are related to each other based in the bibliographic coupling. In other words, researchers that are located close to each other tend to cite the same publications, while researchers that are located far away from each other usually do not cite the same publications.

In Figure 5 there are four clusters: three are moderate and one is small. The clusters are indicated by blue, red, green, and yellow. In the Bibliographic coupling visualization presented in Figures 5, 6, and 7, each circle represents a researcher. Yli-renko (2001), Sambamurthy (2003), Lee (2001), and Jones (2011a) form one prominent node in blue color.

Rothaermel (2007), Elfring (2003), Autio (2014), Spigel (2017), Mair (2009), Dakhlin (2004), Bowen (2008), and Davidson (2015) form another node, displayed in red.

Muller (2001), Linan (2009), Schlaegel (2014), and Kuckertz (2010) form the small node in yellow.

Lumpkin (2001), Jones (2005), Rosenbusch (2011), and Covin (2011) form the fourth node in green.

Figure 6 displays bibliographic coupling of IM and displays three major clusters in red, blue, and green. Hulzinger (2011), West (2014), Faems (2005), Gawer (2014), and Danneels (2004) are the prominent authors in the red cluster. Gracia (2001), Griffin (1996), Adams (2006), and Sivadas (2000) are the prominent authors in the blue cluster, and Anderson (2014), Narver (2004), and Nambisan(2009) are the prominent authors in the green cluster. In addition to these three main clusters, there is an emerging small cluster in yellow with Poets (2012) and Franke (2006) as the main contributing authors.

Figure 7 displays bibliographic coupling of SE in four clusters, in red, green, blue, and yellow. The red cluster has Voinov (2010), Reed (2014), Forsythe (2016), and Rycroft-Malone (2016) as prominent authors, followed by the green cluster with Jongbloed (2008), Foerstl (2015), and Sloan (2013). Godfrey (2009) and Arayssi (2016) are in the blue cluster, and Prado-Lorenzo (2009) and Skouloudis (2010) are in the yellow cluster.

(Figure 5)
(Figure 6)
(Figure 7)

Citation and co-citation analysis

Citation analysis is used to examine the degree of connectivity between pairs of nodes/papers in the created node network. (Fahimnia et al., 2015). Co-citation analysis itself consists of methods including bibliographic coupling, document co-citation analysis, author co-citation analysis, and co-word analysis (Charvet et al., 2008; Eom, 2003).

Originally, bibliometric analyses started in information sciences (Osareh, 1996). Figures 8, 9, and 10 show the prominent nodes in the citation network with a high number of local citations. In the network of bibliographic couplings, several regions that display densely interconnected nodes are prominent (Vogel & Güttel, 2013).

Figure 8 shows five prominent clusters of co-citation networks for ED: Barney (1991), Teece (1997), Armstrong (1977), and Fornell (1981) are the main authors in the red cluster. The green cluster has Shane (2000), Krueger (2000), and Ajzen (1991) as prominent authors; the blue cluster has Wennekers (1999) and North (1990) as prominent authors; the yellow cluster has Granovetter

(1985) and Eisenhardt (1989); and the purple cluster has Shane (2004) and Etzkowitz(2000) as the prominent authors in the ED co-citation diagram.

Figure 9 shows the co-citation network for IM, with four nodes in green, blue, yellow, and red, which are largely scattered. Cohen (1990), Krueger (2000), Yli-renko (2001), Sambamurthy (2003), Pittaway (2007), and Gulbrandsen (2005) are the most prominent authors, indicating their relative importance in the field of IM.

Figure 10 shows the co-citation network for SE, with five nodes: green, blue, yellow, purple, and red, which are small and generally closely connected. McWilliams (2000) is prominent in the blue network, Freeman (1984) in the purple network, Reed (2018) and Arnstein (1969) in the red colored network, Braun (2016) in the green network, and Morsing (2006), Adams (2002), Kaplan (2010), and Waters (2009) are seen in the yellow network.

In citation diagrams, each research cluster is displayed in a different color. The shorter the length of the mean path between one node and others, the higher is its centrality in the network. (Vogel & Güttel, 2013). In the citation diagram, the size of each node reflects its citation frequency (Wang et al., 2015). Looking at networks, nodes that are more central, connect nodes of the network that are on the periphery. With this algorithm, the most connected nodes move to the center of the network while the more isolated (less connected) nodes move to the borders. (Fahimnia et al., 2015).

(Figure 8)
(Figure 9)
(Figure 10)

Figure 11 shows the citation network for ED: Krueger (2000), Yli-renko (2001), Sambamurthy (2003), Pittaway (2007a), and Gulbrandsen (2005) are the most prominent nodes in the network, indicating their relative importance in the field of ED.

(Figure 11)
(Figure 12)
(Figure 13)

Figure 12 shows the citation network for IM, with multiple nodes which are well fragmented. The prominent authors are Teece (2010), Faema (2005), Gracia (2002), and Griffin (1997). Figure 13

shows the citation network for SE, with authors Ray (2013), Godfrey (2009), Voinov (2010), Pomeroy (20018), Lovejoy (2012b).

Co-occurrence

Each circle in the visualizations presented in Figures 14, 15, and 16 represents a factor. The size of a circle reflects the number of times the factor has been studied and published.

VOSviewer identified six clusters in ED co-occurrence, which are indicated using colors in the visualization shown in Figure 14. The light blue cluster is relatively small and is displayed as an outlier towards the right and consists of keywords such as “expression”, “design”, “systems”, “inflammation”, and “catalyst”.

Of the four larger clusters, the blue one consists mainly of “entrepreneurship”, “growth”, “competition”, “entry”, and “self-employment”. The green cluster consists of “entrepreneurial orientation”, “firm performance”, “management”, “competitive advantage”, “absorptive capacity”, and “research and development” as the key research areas.

The yellow-colored cluster has keywords such as “impact”, “framework”, “gender”, “self-efficacy”, “personality”, and “perspective”. The purple color covers “firms”, “market”, “collaboration”, “technology-transfer”, “clusters”, “commercialization”, “startups”, etc., and the red cluster consists of keywords such as “governance”, “policy”, “politics”, “migration”, “city”, “framework”, and “identity”.

VOSviewer identified six clusters of IM co-occurrence (Figure 15). The green color cluster shows “innovation”, “innovation management”, “industry”, and “firms” as the most developed areas, followed by “research and development”. The red-colored cluster has keywords such as “design”, “quality”, “model”, “behavior”, “users”, and “perceptions” that have been well developed or predominant. The yellow-colored cluster is fragmented to a large extent, with emerging areas such as “satisfaction”, “employee creativity”, “mediating roles”, and “work”. The purple-colored cluster is also fragmented but has some emerging areas such as “exploitation”, “competitive advantage”, and “market orientation”.

VOSviewer identified four main clusters in SE co-occurrence (Figure 16). The red cluster shows “care”, “patient engagement”, “children coverage”, and “participatory research” as the most developed areas. The predominant areas in the blue-colored cluster are “impact”, “performance”, “sustainable development”, “CSR”, and “financial performance”. In the green cluster, the dominant areas are “framework”, “policy”, “conversation”, “science”, and “climate change”. Finally, the yellow-colored cluster is fragmented and has areas such as “social license”, “online”, and “technology”.

(Figure 14)

(Figure 15)

(Figure 16)

Factor map VantagePoint can be used to create visual maps of data. A factor map is a graphical representation of the results of a principal component analysis (PCA), which finds the list of items that frequently occur together in the dataset. We performed a PCA to study the network of co-cited factors (Figure 17) Each node in the map represents a cluster of terms. The lines between nodes represent a measure of similarity between the two clusters of terms. The thickness (or pattern) of the line indicates the degree of similarity (as defined in the legend) – a number between 0 and 1. To reduce visual clutter, only the strongest of the entire set of similarities are shown. It is seen that professional values, perspectives, opportunity-driven entrepreneurship, and influences have factor map links of 0.50 to 0.75.

(Figure 17)

New product development alliances have weak similarities with entrepreneurship orientation, absorptive capacity, joint impact, etc. The main advantage of this program over most information technology programs available for bibliometric mapping is that it focuses on the graphical representations of the maps. The matrix chart displays terms as nodes and shared records or correlations (depending on matrix type) as lines between them. The matrix of Country by Author Keywords in Figure 18 shows the USA has the most scholarly publications in JBR with keywords such as “entrepreneurship development”, followed by Spain and the UK. The matrix in Figure 19 shows the various authors who have contributed to the body of knowledge of ED in JBR and their linkages to various countries. This helps us understand how the bibliometric domain has evolved in JBR since its inception. The blue nodes represent the rows of the matrix which has author names

and year; the brown nodes represent the columns with country names. Figure 19 illustrates the matrix of Author Year by Country.

(Figure 18)
(Figure 19)

The bubble map of Figure 20 illustrates the Author vs Country, and it is apparent that publications in JBR have increased exponentially in the USA, followed by the UK, Spain, and Italy in the domain of ED.

(Figure 20)

A cross-correlation matrix shows correlations among items in a list based on the values in another list. There are three types of maps offered in VantagePoint: cross-correlation map, auto-correlation map, and factor map. A cross-correlation map shows relationships among items in a list based on the values in another list. For example, a cross-correlation matrix of authors, using descriptors, can show groups of people who write about the same things.

Figure 21 shows a cross-correlation map with 51 nodes for IM, which can be interpreted that authors, such as Rosa (2018), Allen (2015), Gombault (2016), and Kashmiri (2016), have links > 0.75. Similarly, authors Ratten (2016) and Ngo (2013) have a strong cross-correlation.

Cenamor (2019) and Bianchi (2020) have a strong cross-correlation, as do Bos (2015) and Frambach (2002).

In addition to the above, there are small clusters formed by authors like Hubert (2017) with Poorkavoos (2016) and Pantano (2019), and Gonzalez (2018), Maravilhas (2019), and Jugend (2016) forming an isolated cluster.

(Figure 21)

The matrix chart displays terms as nodes and shared records or correlations (depending on matrix type) as lines between them. The matrix of Country by Author Keywords in Figure 22 shows that the USA has the most scholarly publications in JBR with keywords such as “innovation management”, followed by Italy, Spain, Taiwan, and the UK. The matrix in Figure 23 shows the various authors who have contributed to the body of knowledge of IM in JBR and their linkages to various countries. This helps us understand how the IM domain has evolved in JBR since its inception. The blue nodes represent the rows of the matrix which has author names and year; the

yellow nodes represent the columns with country names. Figure 23 illustrates the matrix of Author Year by Country.

(Figure 22)

(Figure 23)

(Figure 24)

The bubble map of Figure 24 illustrates the Year vs Country, and it is apparent that publications in JBR have increased exponentially after 2016 in the IM domain, with most articles published in 2016 and 2019.

As an endnote for the bibliometric analysis, it is worth mentioning that dynamics of the interaction of SE, IM, and ED are shaping the scholarship of academic research in entrepreneurship. Our analyses reaffirm that contemporary research conducted at the intersection of SE, IM, and ED is indicative of the consolidation of these tenets in future bibliometric research. Although disparate studies in SE, IM, and ED in entrepreneurship research are still heterogeneous, we have successfully identified shared research focuses among contemporary commentaries that have amplified the interconnectedness of the SE, IM, and ED research fields in entrepreneurship. This is a nascent field of research to examine the dynamic pattern of interactions of these three tenets of entrepreneurship research leading to an integrative view. The presence of conclusive text analytics and data visualizations related to the SE, IM, and ED intersection strengthen this supposition.

Research directions and conclusion

(Table 3)

Extracting from Figure 14, 15 and 16, Table 3 presents the factors that are mostly studied together and separately in SE, IM, and ED research in entrepreneurship. Table 3 presents five clusters of factors for ED, and four clusters of factors for IM and SE research. Based on Table 3, we propose mainly two research directions to underpin the research and practice on the implications of SE for IM and ED:

- research on the factors that are mostly studied separately within a single research-stream among SE, IM, and ED;
- research on the factors across the three research streams (e.g., explore the implications of a factor from IM or SE research for ED, and vice-versa).

For example, Table 3 shows that growth, self-employment, market entry, and market competition (ED cluster 2), and gender, self-efficacy, and (entrepreneurs') personality (ED cluster 3) are mostly researched separately in the ED research stream. These factors (or some of them) across the ED clusters 2 and 3 could be analyzed together to explore the implications of SE to underpin IM and ED, in order to pursue the first research direction. Similarly, for the second research direction, the factors across the different IM, ED, and SE clusters (which are mostly studied separately, as shown in Table 3) could be analyzed together for the same purpose. For example, collaboration, technology-transfer, commercialization, and start-ups (ED cluster 4), and satisfaction and employee creativity (IM cluster 3), and policy, dialogue, and conversation (SE cluster 3) could be analyzed together to explore SE's implications for IM and ED.

(Table 4)

Extracting from Table 3, Table 4 classifies all these factors that are studied jointly and separately across SE, IM, and ED research streams in entrepreneurship as “exploratory factors” and “exploitative factors”. Based on Table 4, we propose a third research direction: analyzing the impact of SE and an ED exploratory factor on an IM exploitative factor, and vice-versa. For example, Table 4 shows that “entrepreneurial orientation” is mainly researched as an exploratory factor under the ED research stream. Future research could be undertaken to explore novel insights from diverse socio-economic, ecological, industry, and market perspectives to understand the implications of “entrepreneurial orientation” for “design, quality, and competitive advantage”, which are mainly researched under the IM research stream as exploitative factors.

Kholi and Jaworski (1990) define market orientation as the organisation-wide generation of market intelligence that pertains to current and future customer (and other stakeholders') needs, dissemination of intelligence across departments, and organisation-wide responsiveness” (Hurley and Hult, 1998, p. 43). Such a development of market intelligence involves recurrent monitoring of target market conditions, relevant to customers, competitors and overall socio-economic environments to develop and offer services that are expected and accepted by customers (Kholi and Jaworski, 1990; Narver and Slater, 1990; Slater and Narver, 1994, 2000; Camilleri, 2019). (Shams and Hasan, 2020, p. 463)

In this context, “entrepreneurial orientation” as an exploratory factor would be instrumental to underpin the design and quality assurance initiatives of a product or service to influence its competitive advantage as an IM initiative. For example, understanding customers' needs as part of an entrepreneurial orientation effort is generally valuable to design a product or service in a way that would be expected and accepted by the customers.

The aim of this introductory paper of this JBR special issue is to undertake a meta-analysis at the intersection of SE, IM, and ED to understand the progress on the foremost themes and correlation (and dissimilar aspects) among these three recognized but under-researched concepts of entrepreneurship research, in order to explore the embryonic research directions in this field. To meet this aim, our meta-analysis presents the existing research at this intersection, and identifies the most relevant authors, articles, journals, keywords, and citations in this field, as well as presents the links (i.e., the factors that are mostly studied together) and divergences (i.e., the factors that are mostly studied separately) as the key themes of research in this field. Furthermore, we present three research directions based on our meta-analysis that demonstrates the correlation and inter- and intra-dependence among these key themes. In this JBR special issue, we present 28 other articles on these and different other cognate themes and topics that contribute to the research gaps at the intersection of SE, IM, and ED, which are related to the research directions that we have discussed in this paper. We invite the scholars in this field to join us in exploring novel insights centred on these research directions to underpin the SE's contribution to IM and ED.

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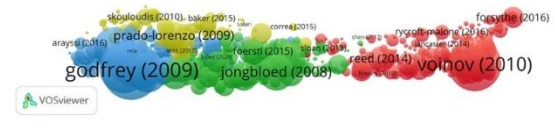
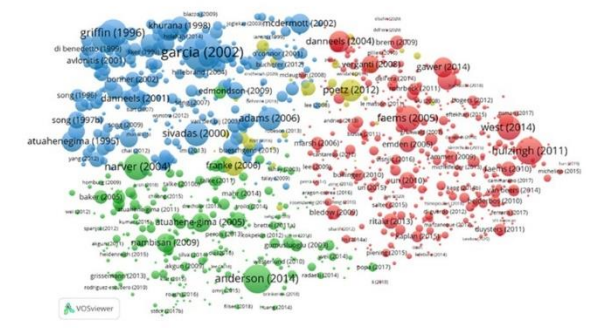
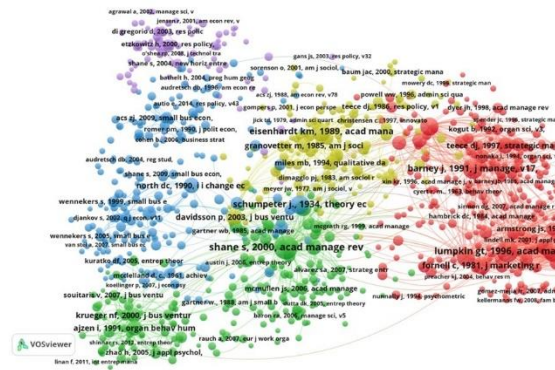
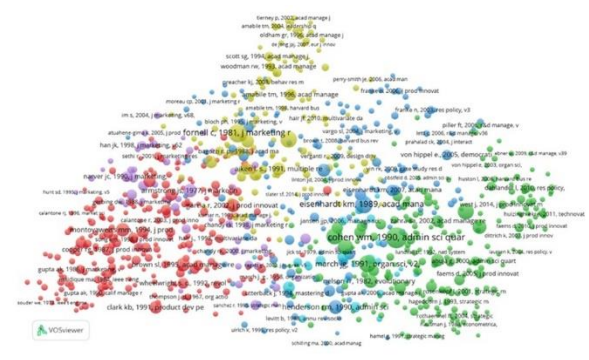
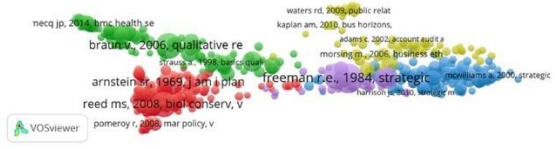
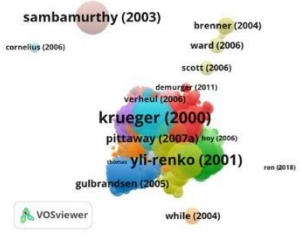
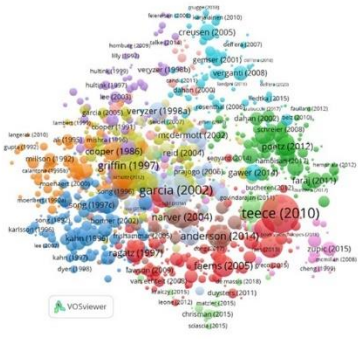
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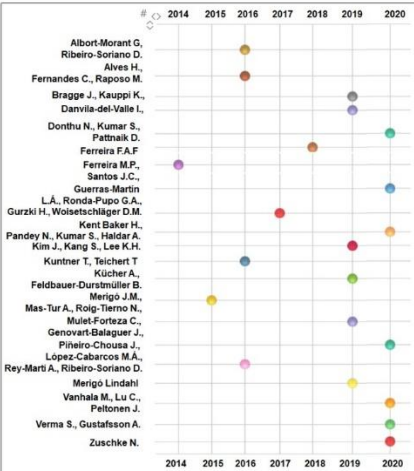
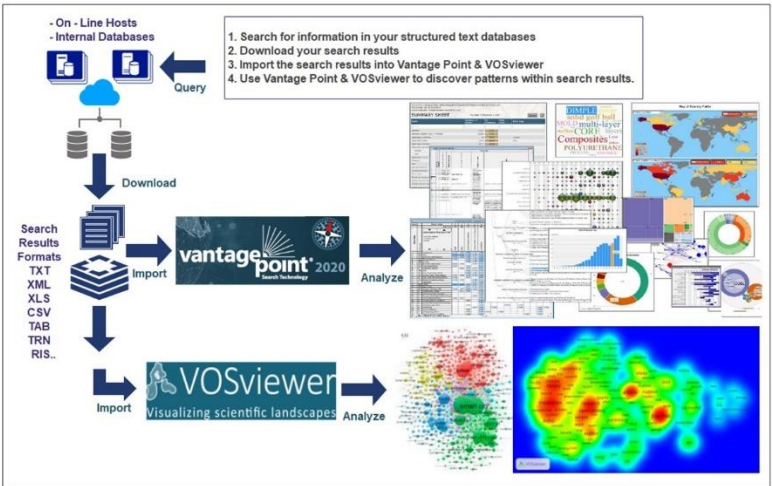
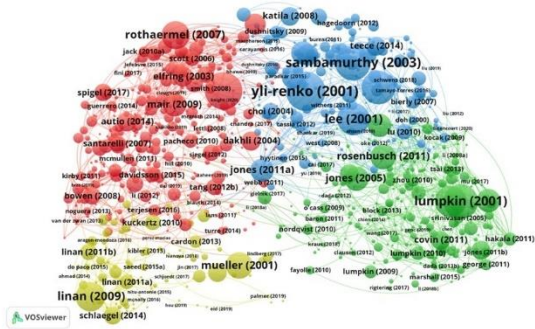
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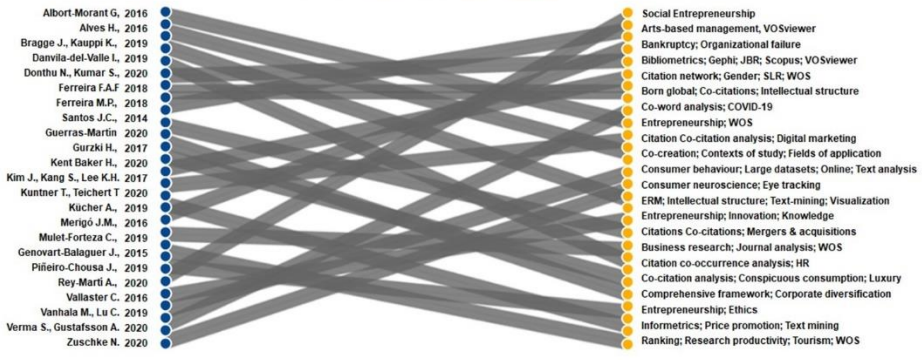
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