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Entrepreneurship and innovation in a global context

Ever since Sir Tim Berners-Lee invented the World Wide Web in 1989, the world is revolutionized in ways of communications and social networking. Now technology advancement drives transformation around the world with fastened speed of globalization, allowing more companies achieving globalization and recognize cross-cultural, cross-national, cross-disciplinary opportunities to create new value-added activities. Technology advancement such as the fourth industrial revolution will inevitably transform the ways in which we live, work and interact with one another. As such, we need to embrace technology changes and examine the evolving domain of international entrepreneurship (IE) research and identify where the gaps are in our current knowledge and suggest directions for future research.

IE research is relatively new in the academic field. The widely adopted definition is “the discovery, enactment, evaluation and exploitation of opportunities – across national borders – to create future goods and services” (Oviatt and McDougall, 2005, p. 540). Since the domain of IE includes numerous dimensions, previous cross-country analyses have included socioeconomic environment, institutions, norms, culture as well as industry clusters and geographic parameters, all of which making IE research highly fragmented with substantial knowledge gaps related to content, theory and methodology (Terjesen et al., 2016).

A recent review article by Terjesen et al. (2016) suggested a generalizable pattern with similarities and differences across countries or country groups to develop better theories in exploring IE phenomena. In another review article of IE, Reuber et al. (2018) suggested that the assessment of IE research can be done at individual-, firm- and institutional level, by assessing opportunities as an individual-level cognitive activity, the construction of opportunity as a firm-level innovative activity, and the shaping of opportunity as an institutional-level structuring activity (Reuber et al., 2018).

Moreover, advanced technologies create ripple effects on societies, institutions and economies. In particular, technological advancement has speeded up the globalization, facilitated communication and transportation, allowed large and small companies to successfully balance globalization and glocalization, survive and thrive in the global market. Undoubtedly, technology advancement has transformed the ways in which we live, work and interact with one another. Therefore, research on IE needs to adopt a dynamic understanding of businesses and connections, digital domains and offline reality to recognize cross-cultural, cross-country opportunities and innovation in the IE research.

In this broad context, we believe that a special issue on entrepreneurship and innovation in a global context can stimulate more dialogues and add more novel insights for theory and practice. As an initial effort to address this goal, the New England Journal of Entrepreneurship (NEJE) proudly collaborated with the 2018 Academy of International Business US Northeast Chapter (AIB-NE) Conference and produced this inaugural special issue. On behalf of the editorial team of NEJE, we would like to thank the AIB-NE Chapter.
President, Dr Margaret Goralski, Conference Chair, Dr John Cantwell, and Program Chairs, Dr Ram Mudambi and Dr Denise Dunlap, for their support and encouragement. We would also like to thank all the contributing authors who answered our Call for papers and the reviewers who supported us by providing timely and high-quality reviews. This special issue provides a selection of research that contributes to entrepreneurship and innovation in a global context from diverse perspectives. Below we summarize the articles included in this special issue and discuss their contributions to theory and practice.

Demirkan, Yang and Jiang provided a systematic and thorough review of Corporate Entrepreneurship (CE) research of emerging market firms (EMFs) in the last two decades (2000–2019). This is an important contribution to IE because EMFs are making significant contribution to world economy, yet most of the conceptual development in the field of CE has assumed develop market conditions. Although CE can make a big difference in the firm competitiveness of emerging markets (Bruton et al., 2008; Guo et al., 2014), the literature is still lacking in exploring the dynamics of CE in these contexts (e.g. De Clercq et al., 2010; Kiss et al., 2012). Demirkan et al. study summarized CE research in emerging markets within macro and micro contexts and facilitated our understanding of how idiosyncratic firm factors, the industry in which EMFs operate and changes in institutional conditions affect CE of EMFs. Given how the changes of government policies may affect CE in different ways (Guo et al., 2017), they incorporated how different governments roles (grabbing hand, helping hand and invisible hand) affect EMFs’ CE differently. They encourage future research to consider the stage of evaluation of EMFs and adopt a holistic perspective to examine firm’s innovation, strategic renewal and venturing in an interconnected way.

Du and Wang examined the boundary conditions that fostered knowledge transfer within business incubation centers in China. This empirical study examined innovative practices and mechanisms of knowledge transfer across boundary conditions. Based on the qualitative data involving 39 in-depth interviews at three Chinese incubation centers, Du and Wang identified the role of organizational factors and contextual factors in influencing knowledge transfer in China. This study showed that shared values and interests helped build trust among different actors to facilitate the knowledge transfer process across pragmatic boundaries and that entrepreneurship orientation of small- and medium-size enterprises and the use of information rich media positively impacted knowledge transfer. Du and Wang’s study contributes to the literature of knowledge transfer and, in particular, to the understanding of the relationship between boundary conditions and knowledge transfer in the context of emerging economies.

One area that is notably absent in the IE research is the link between academia and industry. Part of the reason is that in academia, the research time-to-market may not be aligned to industry requirements and academic research may not always focus on latest industrial trends and interests. This is understandable, given that the speed of current technological breakthroughs has no historical precedent. Firms are exploring and exploiting innovation at an exponential rather than a linear pace. When technologies allow firms to disrupt almost every industry in every country, it has never been more important than today for the higher education institution to emphasize entrepreneurial education in the curriculum. The perspective article by De Carolis and Litzky discussed how traditional views of entrepreneurship limited the potential of entrepreneurial education. They further proposed the importance of building college students’ entrepreneurial mindset so that our talents can fill the growing needs of global entrepreneurs.

We believe that the pursuit of research on entrepreneurship and innovation in a global context can generate meaningful contributions to theory and practice. From the theory perspective, we need to synthesize different theoretical lens to better define the boundaries of the domain. In terms of practice, we need to collaborate with industry experts to fully grasp the breadth and the depth of technology changes involved in the transformation of
systems of production, networking, communication and governance and how such changes affect firms’ entrepreneurship and innovation activities in a global context. For instance, multinational enterprises (MNEs) are considered the hub in the network of international inter-firm relationships. Thus, MNEs need to integrate entrepreneurial opportunities (new means-ends relationships) and international opportunities (new geographic markets) (Reuber et al., 2018). Yet given the evolution of technologies and their impacts on firms, research on these issues are still lacking. We believe that research on IE and innovation in a global context can evolve by integrating insights from various disciplines and by adopting novel research methods as Demirkan et al. (2019) proposed.

In conclusion, we believe that IE has emerged as an emerging field of study and there is a great need to develop theories and promote actionable research agendas with applied and practical focuses to stimulate dialogues and collaboration among academia, businesses, nonprofit and public organizations from around the world. This special issue represents the initial effort to embrace the fast changing and multifaceted challenges we are facing today. After all, we live in a time where technologies are evolving in an exponential way, so we call for more attention to be directed to issues related to entrepreneurship and innovation in a global context.

Grace Chun Chun Guo and Crystal X. Jiang

References


Corporate entrepreneurship of emerging market firms: current research and future directions

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Abstract
Purpose – The purpose of this paper is to examine the current state of corporate entrepreneurship (CE) of emerging market firms (EMFs) and provide direction for future research on the topic.
Design/methodology/approach – The authors specifically review the recent literature between the years 2000 and 2019 on CE with the keywords “corporate entrepreneurship,” “emerging economies” and “emerging countries” published in the Australian Business Deans Council list journals. The authors review the existing literature about CE in emerging markets, summarize current achievements and present an agenda for future research.
Findings – Based on the review, the authors categorized the macro and micro contexts of CE and summarized the current articles on CE in emerging markets within each macro and micro context. The authors conclude that despite the abundance of research on CE that investigates the three prongs of CE in terms of innovation, strategic renewal and new venturing in developed market contexts, there is a scarcity of literature that focuses on CE in emerging markets from a holistic perspective.
Originality/value – While there is an abundance of literature review on CE in general in terms of the drivers of the construct, the contexts contributing to it and the outcomes, the reviews are lacking about CE specifically within the context of emerging markets. Emerging markets vary from developed markets institutionally, economically, socially and technologically. However, the questions of how these differences impact the CE activities, as it relates to innovation, venturing and strategic renewal in EMFs, and how these differences provide incentives or hinder the activities that contribute to CE remain mostly unanswered. This paper reviewed the research on CE and emerging market contexts from 2000 to present. It targets to provide a better understanding of the current achievement on this topic and what to be done in the future.

Keywords Corporate entrepreneurship, Emerging economies, Review, Organizational characteristics, Emerging market firms, Governments

Paper type Research paper

1. Introduction
By the turn of the century, a developed economy such as the USA had attained a seemingly unimpeachable position as the world’s foremost economic powerhouse. It is only recently that an emerging market such as China has rapidly ascended to the position of the world’s second-largest economy in nominal gross domestic product terms. Emerging market
firms (EMFs) have experienced economic growth and become important players in global business. According to the Emerging Market Multinational Report, E20[1] firms represent 30 percent of the Global Fortune 500 companies and are advancing to the top of many industry sectors (Casanova and Miroux, 2018). For instance, the remarkable performance of Chinese technology firms, three frontrunners of which are famously known as BAT (standing for Baidu, Alibaba and Tencent), epitomizes the rapid transformation of the Chinese technology sector from mere imitator to innovator and has become the object of envy. Hence, the need to further explore the activities of EMFs and how they create and sustain competitive advantages has become prevalent.

Corporate entrepreneurship (CE) (also known as intrapreneurship), with its focus on three pillars of innovation, venturing into new markets and strategic renewal (Covin and Slevin, 1991), is a significant source of competitive advantage for firms in emerging economies. Correspondingly, more research has developed to examine how EMFs have undertaken entrepreneurial transformations to revitalize, reconfigure and transform successfully with emerging markets’ institutional transition and industrial change (e.g. Luo et al., 2011; Wang et al., 2012; Yiu and Lau, 2008; Yiu et al., 2007; Zahra, Ireland, Gutierrez and Hitt, 2000).

While there is an abundance of literature review on CE in general in terms of the drivers of the construct, the contexts contributing to it and the outcomes (Phan et al., 2009; Sakhdari, 2016), the reviews are lacking about CE specifically within the context of emerging markets. Compared to developed countries, emerging markets vary institutionally, economically, culturally, socially and technologically. However, the questions of how these differences in emerging market contexts impact the CE activities, as it relates to innovation, venturing and strategic renewal in EMFs, and how these differences provide incentives or hinder the activities that contribute to CE remain mostly unanswered. Hence, there is a strong need to consider the situation and contexts to fully comprehend the CE activities in EMFs (Liu and Vrontis, 2017).

When we further investigate the CE research in emerging markets, we find out that most of the existing research focuses on the concepts of innovation, venturing (international or domestic) and strategic renewal separately rather than holistically. From this standpoint, the research is not lacking when it comes to, for example, the antecedents of innovation in emerging markets, international and/or domestic venturing by emerging country firms, and strategic renewal carried out by firms in emerging economies. These concepts have been researched separately, independently of one another, in the context of emerging markets. For example, an EBSCO search that includes the peer-reviewed academic journals in the management and business areas, inclusively between the years 2000 and 2019, with the keywords “innovation” and “emerging markets” or “emerging economies,” gives 447 scholarly articles, focusing on various aspects of CE, such as innovation, in emerging economies (retrieved on January 26, 2019). This number drastically decreases to 35 when we limit the keywords only to “corporate entrepreneurship,” which considers the concepts of innovation, strategic renewal and venturing in an interconnected, i.e. holistic, way. For example, the literature on CE in developed economies has mostly used the 22-scale item survey (13 items for innovation measurements and 9 items for venturing measurements) developed by Zahra, Neubaum and Huse (2000), we failed to see studies within the context of emerging markets that utilize similar survey measures that include activities of innovation, venturing and strategic renewal together.

Moreover, existing research on CE suggests that the characteristics of corporate governance of a company is very important in driving CE activities within the firm (Zahra, Neubaum and Huse, 2000; Zahra, Ireland, Gutierrez and Hitt, 2000). However, research on emerging economies suggests that because markets are generally imperfect and incomplete, efficient corporate governance mechanisms, as in the case of developed economies, may not exist (Allen, 2005). Hence, there will be differences in CE between emerging economies and
developed country economies. In addition, since emerging markets are different from
developed economies in regard to factors such as the intensity of competition, growth and
risk implications of industries and markets, we suggest that how firms initiate and employ
CE activities can also vary from one another and that this variation will be different across
emerging market countries as well.

Accordingly, this paper aims to examine the current state of CE in emerging markets and
provides direction for future research on the topic. Our primary focus is the studies on CE
that have been published since the year 2000 because the first two decades of the twenty-
first century have been characterized by rapid transformation of EMFs. First, we review the
existing literature about CE in emerging markets; then, we summarize current
achievements; and third we present what needs to be explored in the future.

Since EMFs are found to possess a tight coupling between country-specific advantages
and firm-specific advantages (FSAs) (Khanna and Palepu, 2006; Ramamurti and Singh,
2009), we reviewed both macro context (institution and government effects) and micro
context (firm, team and individual level) topics of CE in emerging markets. Similarly, a
recent review by Sakhdari (2016) on CE categorizes the research in this area based on their
levels of analysis involving the team management, firm, network/dyad and environment
levels corresponding with our macro and micro context review.

We started our sample search in EBSCO, looking for articles that have “corporate
entrepreneurship” and “emerging countries” and/or “emerging economies” in their title,
abstract or keywords, while spanning the period from 2000 to 2019 in peer-reviewed
management, international business and entrepreneurship journals. This search yielded an
outcome of 240 papers in various journals. To assess the quality of journals we searched
which of these journals are included in the Australian Business Deans Council (ABDC)
Journal Quality List[2]. In total, 207 of them listed in the ABDC list, with quality ranging
from top-rated A* to C-level journals. From this list, we further identified the academic
articles on macro and micro aspects of CE in emerging markets (see Table AI). Although we
acknowledge that the list may not be comprehensive since it is dependent on one database
source, it sufficiently covers the domain of research in CE from emerging markets in past
decades (2000–2019). A more comprehensive list of the journals reviewed in this survey is
provided in Table AII.

According to our review, we categorized the macro and micro context of CE as follows.
The macro context of CE in EMFs:

(1) Institutional environment and CE of EMFs;

(2) Government roles on CE activities of EMFs:
   - governments’ direct intervention in CE activities (grabbing hand model);
   - governments’ support to promote CE activities (helping hand model); and
   - governments’ indirect support to foster CE activities (invisible hand model).

The micro context of CE in EMFs:

(1) market entry decisions and CE of EMFs;
(2) organizational resources and capabilities and their impacts on CE;
(3) EMFs’ organizational culture, leadership, and CE;
(4) EMFs’ team characteristics and individual-level studies on CE; and
(5) CE and EMFs’ performance.

Our paper shows two main current issues in the CE literature in emerging markets. First,
our review on macro context of CE in emerging markets points out that institutional
2. The macro context of corporate entrepreneurship of emerging market firms

The macro context of research of CE in emerging countries includes how institutional environment affects CE of EMFs. There is a big research gap between the institutional environment and CE in emerging markets, especially when we specifically consider government involvement and how it affects CE differently. Based on Shleifer and Vishny’s (2002) model, we summarized government involvement in CE as the invisible hand, the helping hand and the grabbing hand. Under the invisible hand model, governments tend to restrict themselves to providing basic contract enforcement, law and order and regulations. Under the helping hand model, governments are actively involved in promoting economic activities, establishing industry policies and developing close ties to firms. Under the grabbing hand model, governments tend to be interventionists and are more likely to impose lots of regulations on firms.

2.1 Institutional environment and corporate entrepreneurship of emerging market firms

Institutions refer to the rules, social norms and cognitive structures in a society that directs or restricts business activities (Scott, 2008). Both formal factors (regulations, laws and rules) and informal factors (culture, norms and values) are included. Only nine articles were found to be related to institutional environment and CE, and only two of them were found to be about EMFs after a search on EBSCO (retrieved on February 12, 2019).

For instance, Gomez-Haro et al. (2011) examined how different dimensions of institutional environment of a region influence the level of firms’ CE differently. Doh and Pearce (2004) developed that firms employ CE to deal with the changes of government policies. Holmes et al. (2016) illustrated how the interaction of the two dimensions of technology policy (state research funding and intellectual property protection) influences CE. Judge et al. (2015) found that national-level factors such as the capital flows, legal system and the education system affect corporate technological entrepreneurship. Dai and Liu (2015) found that CE mediates the relationship of the institutional network embeddedness and firm performance after studying a few technology clusters in China. Among them, only two articles mentioned the roles of government. Holmes et al. (2016) proposed that some EMFs fell into the categories of high state funding/low IP protection and low state funding/low IP protection, and thus they need to take specific entrepreneurial strategies. Guo et al. (2017) developed a stage model to explain how governments play different roles to promote firm CE at different times.

2.2 Summary of government roles on corporate entrepreneurship activities of emerging market firms

Many emerging economies are experiencing large-scale institutional transitions (Carney et al., 2009; Filatotchev et al., 2012; Hoskisson et al., 2000; Krug and Hendrischke, 2012; Meyer and Peng, 2005; Peng, 2003; Wright et al., 2005). Such institutional transitions lead to changes of political and legal climate, business environment, economic situation, and global competition, among others. Institutional environments shape firms’ CE because “CE occurs
within environmental contexts that place complex demands on firms and affect the financial returns that CE generates” (Holmes *et al.*, 2016, p. 248). Previous research has shown that institutions affect firm CE process (Guo *et al.*, 2014), and CE-related outcome (e.g. Sine *et al.*, 2005; Globerman and Shapiro, 2003).

Since firms of emerging economies face institutional environments such as changes of rules and regulations, poor IP protection, and insufficient or unavailable external finance sources (e.g. Holmes *et al.*, 2016; Meyer and Peng, 2005), governments in these countries may actively stimulate firms to take entrepreneurial activities directly, which is different from those in the developed countries. Governments are generally an important contextual factor influencing firm behavior (Ring *et al.*, 2005). Especially in emerging markets, governments play critical roles in economic activities (Bruton and Lau, 2008; Malik and Kotabe, 2009; Wright *et al.*, 2005). For instance, governments in Brazil, China and Russia are recognized as being very influential on firms’ behavior. Some recent research focused on the effect of government involvement on stimulating innovation and competitive advantage (Lazzarini, 2015; Mazzucato, 2015), and international expansion in countries such as China, Indonesia and Brazil (e.g. Hong *et al.*, 2015; World Investment Report, 2008).

2.2.1 Governments’ direct intervention in corporate entrepreneurship activities (grabbing hand model). Government may take direct intervention in firms’ activities such as innovation, international venturing and strategic renewal. State-owned enterprises (SOEs), which refers to firms with majority government ownership (Boisot and Child, 1996; Jefferson *et al.*, 2003) that act as government agencies, are a good example of direct involvement of governments in economic activities because they carry out the state’s regulations and policies (Shleifer, 1998).

For instance, in recent years the Chinese Government has put innovation as the top national development priority and encourages firm innovation activities strongly. As the main agencies of Chinese Government, SOEs respond actively to government calls and invest on R&D (Zhou *et al.*, 2017). In addition, firm innovation needs substantial resources, and SOEs have great advantages to access key resources such as funding, land and technical infrastructure, which are mainly controlled by governments (Chen, Li, Shapiro and Zhang, 2014; Sheng *et al.*, 2011). SOEs are priorities for the state-owned banks, which are the major source of financial capital (Chen, Li, Shapiro and Zhang, 2014; Chen, Tang, Jin, Xie and Li, 2014; Xu and Zhang, 2008). In addition, SOEs are more likely to obtain funding with lower cost (Khwaja and Mian, 2005), to get subsidies from governments (Musacchio and Lazzarini, 2014; Ramaswamy, 2001) and to procure government R&D funding and other incentives (Chang *et al.*, 2006; Siegel, 2007; Sun and Liu, 2014; Wang *et al.*, 2012), all of which enable these firms to conduct innovative activities. In sum, state ownership of firms fosters innovation due to access of policy information, government support and valuable resources. However, this effect is weakened with the development of market (Zhou *et al.*, 2017).

Government direct ownership also affects firms’ internationalization. Hong *et al.* (2015) mentioned that in some underdeveloped regions, government officials may coerce local firms to “align their goals with government interests” (p. 50). Governments may use their power to make firms realize objectives like globalization. Governments may create normative pressures for SOEs to go international. To accommodate governments’ political objectives and show their political standing, SOEs may implement state policies and take the internationalization initiatives (Deng, 2009; Hong *et al.*, 2015; Wang *et al.*, 2012). Further, SOEs can gain access to intelligence reports about foreign markets from government, thus reducing investment cost and uncertainty of their international venturing (Khanna *et al.*, 2005).

Finally, government may directly reorganize some organizations and institutions to better implement its national development policies. For instance, Lenovo was spun off from
the Chinese Academy of Sciences (CAS), which is a research and education institution, and started their business in the computer industry. Based on a government initiative, Lenovo was established in Zhongguancun (a technology hub in Beijing, China) to reform the national science and technology system (Lazonick, 2004; Lu, 2000).

2.2.2 Governments’ support to promote corporate entrepreneurship activities (helping hand model). According to political economy theory, governments create rules by which businesses must abide (Boddewyn, 1988; Kofele-Kale, 1992). Specially, governments may employ policies, national strategic planning, financing and other regulations to stimulate firms’ certain activities (Hoskisson et al., 2000; Sun and Liu, 2014). Various innovation programs, tax incentives, information and technology resources, and other legal protections are applied to promote firm innovation (Lemola, 2002; Mustar and Larédo, 2002).

For instance, Chinese Governments provide subsidies, tax deductions and funds to all firms that conduct their preferred innovation activities (Zhou et al., 2017). It is found that governments’ innovation policies and resource allocations in countries like South Korea and China benefit firms’ technological development (Fan and Watanabe, 2006; Lee and Lim, 2001). Tax credits, subsidies, low interest loans and other support from governments are helpful in improving new product innovation in South Korea and Taiwan (Schoening et al., 1998). Some Latin American and Caribbean (LAC) countries use fiscal incentives, intellectual property rights protection and other complementary instruments such as cluster policies, special programs and governmental procurement to strengthen technology policies (Hall and Maffioli, 2008). George and Prabhu (2000) found that government uses developmental financial institutions to foster entrepreneurship in large firms of core industries (steel, pharmaceutical and transportation).

Governments also foster collaborative innovation activities to promote firm innovation competitiveness (Kaminski et al., 2008; Zheng et al., 2013). Government policies promote firms to collaborate with others in innovation. These collaborative activities may include multiple institutions across regions, therefore needing formal approval and support from regional governments. As such, networking, cross-regional coordination mechanisms and local governments support are crucial to implement the collaboration (Xie et al., 2017). Better access to government-supported innovation systems (universities, research institutions, etc.) can not only improve firms’ technological development, but also increase the attraction of talented personnel for innovation (Li and Li, 2013; Li et al., 2018). Government can help firms gain access to valuable knowledge, provide valuable resources and help firms to accumulate organization capabilities to innovate (e.g. Guo et al., 2014; Zhou et al., 2017).

Established firms’ internationalization could be promoted by governments too. Luo et al. (2010) suggested that governments make international treaties that protect outbound foreign direct investment to support EMFs’ international expansion. Hong et al. (2015) pointed out that central government “formulates regulatory frameworks to guide internationalization, ease capital controls and provide information and guidance on investment opportunities, governments at lower levels are responsible for implementing central government’s policies by, for example, using incentives to encourage and direct EMFs to expand abroad” (Kumar and Worm, 2004, p. 48). In emerging countries, governments may shape firms’ internationalization through fiscal incentives, tax laws and trade agreements (Luo et al., 2010; Wang et al., 2012). Chinese Government implements the “go global” policy, providing export subsidies, tax rebates, foreign exchange assistance and other support to stimulate firms’ internationalization (Hong et al., 2015). Pinto et al. (2017) also found that government financial support (subsidies, low interest loans) is important for LAC countries to expand abroad. For example, Brazil’s Government used its financial institutions, such as state-owned banks and development banks, to support Brazilian multinational corporations’ (MNCs) internationalization.
Besides, EMFs may benefit from preferential policies (Cui and Jiang, 2012) and the help of government offices abroad (Buckley et al., 2007) for internationalization. Firms may be motivated to expand internationally through governments’ promotion, the assurance of stable political environment and other favorable conditions. Government can help EMFs to reduce cost and risks by connecting the firms with foreign institutions and investors, providing market information and facilitating the political and business relationships in host countries (Malik and Kotabe, 2009; Hong et al., 2015).

2.2.3 Governments’ indirect support to foster corporate entrepreneurship activities (invisible hand model). Governments in emerging markets may put effort into improving the institutional development for firms to implement CE. Firms in emerging markets face deficiencies such as weak legal environment, lack of financial resources and shortage of skilled labor, which hinders firms’ development (Hoskisson et al., 2000; Zhou et al., 2017). Li et al. (2018) found that government and market stakeholders provide a synergistic effect on firm innovation. The market development includes the improvement of legal environment, capital market, national innovation systems and the education provision. Cheng and Yiu (2016) identified that informal institutions development, the regulative and normative protection of intellectual property and education reform may help Chinese firms to compete successfully in the innovation-driven global economy.

Many governments of emerging markets have designed sets of policies to stimulate innovative activities (Aschhoff and Sofka, 2009; Dolfsma and Seo, 2013). Some policies emphasize pushing the supply of innovations; some emphasize increasing the demand (Edler and Georghiou, 2007); and some utilize the combination of technology-pushing and demand-pulling policies to make radical innovations (van den Ende and Dolfsma, 2005). These diverse policies involve a mix of players, institutions and instruments (Flanagan et al., 2011). Some governments provide such methods as entrepreneurial education, tax concessions, information and technical services, industrial research networks, etc., to improve innovation (Rothwell and Zegveld, 1988).

In addition, governments employ technology policies to build and restructure a country’s innovation infrastructure (Etzkowitz and Leydesdorff, 2000). Government also connects firms, universities and other organizational entities to involve in R&D collaboration, knowledge integration and other entrepreneurial activities (Guo et al., 2014; Holmes et al., 2016). Some governments build innovation networks including public universities, government-funded institutions and other research organizations (Walsh et al., 2009). Chinese Governments encourage the linkages of universities, research institutes and enterprises, strengthen the patent laws, and build new technology zones and industrial or science parks (Chen and Kenney, 2007).

To support firm innovation, government facilitates the growth of private capital firms (Gompers and Lerner, 2001). Governments’ financial incentives and foreign-related policies enable firms to access financial resources to venture into global markets (Jiang et al., 2016; Rasiah et al., 2010; Wang et al., 2012). Further, governments may take some actions to provide and attract skilled labor. For instance, the municipal government of Shenzhen China created several colleges in the last 30 years to deal with the shortage of human capital. In addition, the local government of Shenzhen City connected with Peking University, the CAS, the Chinese Academy of Engineering, and Hong Kong University of Science and Technology to set up a research base and attract more skilled labor to the city (Chen and Kenney, 2007).

The above studies mainly take the perspective of how external knowledge searches bring novelties into the firm and therefore are drivers of firm innovation in emergent markets. What mostly distinguishes these studies from developed country contexts is that of the firms’ reliance on external networks such as business groups (Hong et al., 2015),
specific political ties (Zhang et al., 2015), supply chains (Ren et al., 2015) and collaborative partnerships (Guerrero et al., 2019) in filling the institutional voids that provide support for CE activities.

3. The micro context of corporate entrepreneurship in emerging market firms

The micro context of research of CE constitutes the bulk of research conducted specifically in developed market contexts. Although we recognize that there is no single best way to summarize various topics, they are arranged as follows. First, we summarized research about market entry decisions of CE in emerging markets. Second, research works related to the impact of organizational resources and capabilities on CE are examined. Third, the literature on the impact of organizational culture and leadership on CE is summarized. Fourth, team characteristic is covered. Finally, CE’s effect on firm performance is examined.

3.1 Market entry decisions and corporate entrepreneurship of emerging market firms

Existing research has suggested that EMFs used acquisition as strategic intent to achieve strategic goals. For instance, Rui and Yip (2007) presented Chinese firms that use cross-border acquisition to acquire strategic capabilities to offset their competitive disadvantages and leverage their FSAs. EMFs are also found to use acquisition to overcome “liability of emergingness” in their catch-up process of opportunity-seeking and capability-transformation (Makhok and Keyhani, 2012).

Based on institutional theory, Ang et al. (2015) explained how market entry choices of EMFs are affected by mimetic isomorphism (mimicking home and host country firm behaviors) and how distance between the home and host country affects firms’ internationalization. Similarly, Demirbag et al.’s (2009) research drew upon institutional, transaction cost theories and the springboard perspective to further internationalization of EMFs proposed by Luo and Tung (2007), and they examined the equity composition of foreign affiliates of Turkish MNCs. EMFs’ level of “political constraints, linguistic distance, and the level of knowledge infrastructure in the host country market and parent diversity” affected Turkish MNE’s choice of a joint venture vs a wholly owned enterprise (Demirbag et al., 2009, p. 458).

3.2 Organizational resources and capabilities and their impacts on corporate entrepreneurship

Like MNCs, EMFs need to develop and utilize unique sets of organizational resources to exploit entrepreneurial opportunities. Existing research has investigated how EMFs exploit FSAs and develop organizational capabilities to achieve CE transformation. Specifically, Luo et al.’s (2011) research proposed a dual strategic intent perspective in which EMFs exploit FSAs and mitigate market imperfections in home-country institutions through CE activities. Luo and Tung (2007) presented a springboard perspective in which EMFs use international expansion as a springboard to acquire strategic resources to overcome their latecomer disadvantages.

By adopting a dynamic capability perspective, Yiu and Lau (2008) suggested that EMFs exploit resource capital configuration and transformation to pursue CE, including innovation and venturing activities. Other research has adopted a process model to investigate CE through a dynamic lens to assess how unique organizational capabilities affect CE activities at various stages involving initiation, development and implementation (Guo et al., 2014). Through qualitative interviews, Guo et al. (2014) examined the evolution of Chinese automobile companies and identified how EMFs develop different organizational capabilities through the CE process. Similarly, built on previous research on guanxi (Luo, 2000), Chen (2017) looked at how Chinese firms overcome their liability of “outsider” status by developing guanxi-like relationships with their western partners in their international
venturing over a period of time. The process perspective reflects the temporal context in which CE evolves over time (Liu and Vrontis, 2017). Khavul et al. (2010) examined international venturing of EMFs from India, China and South Africa through a process model by which firms synchronize their international venturing (entrainment) by adapting to international customers.

Recent research suggested that EMFs’ CE can be jointly affected (i.e. complementary effect) by their internal organizational resources and capability as well as their access to external resources from their home-country institutions and external partners (Turro et al., 2016). Among them, Liu et al.’s (2013) study investigates how strategic flexibility affects EMFs in their international venturing efforts. They also incorporated institutional and relational assets into the analysis and argued that high levels of domestic institutional support and strong ties with foreign organizations strengthen the above-mentioned positive relationship. Kotabe et al. (2017) investigated how external resources from institutional support complement EMFs’ organizational capability for improved CE (i.e. innovation) performance.

3.3 Emerging market firms’ organizational culture, leadership and corporate entrepreneurship

The literature on CE has somewhat established that the organizational culture of the firm impacts the CE activity of the firm by fostering (hindering) a context that encourages (discourages) entrepreneurial behavior. In a developed country context, namely, the USA, Hornsby et al. (1999) have shown that entrepreneurial behavior is significantly related to the existence of particular organizational factors. While organizational culture ranks among the factors that most impact CE, by creating an overall entrepreneurial culture within the firm and emphasizing motivational factors that support implementation of entrepreneurial activities (Arz, 2017), the role of organizational culture in EMFs has not been studied extensively. When we take the view that national culture may play a significant role in shaping the organizational culture of the firm (Gerhart and Fang, 2005; Gerhart, 2009; Lee and Kramer, 2016), we need to further look into emerging markets and ask whether the relationship between organizational culture and CE is any different, and if so, in what ways.

Our review has revealed that while there are not many studies published on the organizational culture and CE link – specifically in the context of emerging markets – existing studies have looked into the roles of, for example, how employees’ perceived organizational support for entrepreneurial activities within the firm plays a mediating role between high-performance human resource activities and CE in Chinese biotechnology firms (Zhang and Jia, 2010). Similarly, Ziyae (2016) in a recent study of Iranian firms showed a moderating role for organizational culture in the relationship between human resource management and CE. Furthermore, a recent study conducted in Kenyan small- and medium-sized enterprises by Hughes and Mustafa (2017) revealed that supportive internal organizational environments, specifically the role of the top management support, are important antecedents for CE.

While, to the authors’ knowledge, the studies that focus on “organizational culture” and CE in EMFs are quite limited, the list increases when we consider the role of leadership as a subset of the organizational culture of the firm. Considering the role of leadership in the firm in a notable study in Administrative Science Quarterly, Chen and Nadkami (2017), by focusing on small- and medium-sized Chinese firms, demonstrated that a chief executive officer’s (CEO) temporal leadership plays a mediating role between the CEO’s temporal dispositions and CE in terms of innovation, corporate venturing and strategic renewal activities. In a similar fashion, in a study of small and medium enterprises in Pakistan, Shafique and Kalyar (2018) showed that the type of leadership, in this case transformational leadership, positively affects CE and its dimensions of innovation, new business venturing, self-renewal, proactivity and risk-taking. In another study that looks at firms in Poland, Zbierowski (2016) found that
leadership type, such as authentic leadership, in addition to the fundamental state of leadership, psychological capital and positive deviance all impact CE positively.

From another angle, some of the notable research that is published in mainstream innovation journals, such as the *Journal of Product Innovation Management*, looks into and fully supports the mediating role of CE on the relationship between CEOs’ transformational leadership and product innovation performance (Chen, Tang, Jin, Xie and Li, 2014).

Most studies about EMFs either examined the direct relationship between leadership types and CE or the mediating/moderating role of leadership in impacting the CE activities of the firm. While we think existing studies make important contributions, there are still more opportunities for research in emerging market contexts. Moreover, it is notable that some of the research that focuses on EMFs is not labeled as pertaining to “emergent markets” but have a more generalized focus while still using emerging market countries as the context of their study.

3.4 Emerging market firms’ team characteristics and individual-level studies on corporate entrepreneurship

The research has looked into the role of teams on CE from a variety of perspectives. There have been studies that researched product innovation teams, top management teams or entrepreneurial teams. For example, in a recent study published in *Strategic Management Journal*, the authors tested the diversity of top management teams in terms of their national backgrounds and how that diversity affected CE and the innovative performance of multinational companies (Boone *et al.*, 2019). Similarly, Heavey and Simsek (2013) have focused their research on the impact of human and social capital of top management teams on CE, since CE is mostly carried out by the top management team. While these studies make important contributions to the CE literature, specifically considering the role of top management teams, they are mostly in developed country contexts.

Considering team-level studies, the ones that specifically focus on the emergent market context look at innovation teams, taking only the innovation aspect of CE. At the team level, we find that the studies mostly focus on innovation and new product development teams, for example, looking into how behavioral integration and collective efficacy of the new product development teams (Liu *et al.*, 2015) and factors such as team identity (Litchfield *et al.*, 2018) affect the innovativeness performance of the team.

The individual entrepreneurial behavior of employees within the organization is also stated among the important drivers of CE. A recent systematic review of the individual-level antecedents of CE by Mustafa *et al.* (2018) has shown that employee entrepreneurial behavior is an emerging research field and that employee entrepreneurial behavior is also determined by the context of the firm. However, their review and the papers included in this review mostly focus on developed country contexts.

In our study, we reviewed some individual-level studies that investigate the role of the employees within the context of CE. At the individual level, one recent study by Urban and Wood (2015) researches how the opportunity recognition behavior and motivation of employees impact the CE activity of the firm. Their results show a significant relationship between these individual-level behaviors and CE activities of the firms in the financial sector in South Africa. Follow-up studies focusing on individual antecedents of CE are also conducted by Urban and colleagues focusing on South Africa as the emerging market context (Urban, 2017; Urban and Verachia, 2019; Urban and Wood, 2017).

3.5 Corporate entrepreneurship and emerging market firms’ performance

Two review articles about the relationship between CE and firm performance were found (Serai *et al.*, 2017; Trang, 2018). Serai *et al.* (2017) summarized from the previous literature
that the effect of CE dimensions and firm performance could be positive, negative or moderating. The firm performance includes financial performance and firm growth. Trang (2018) found that CE, which includes entrepreneurial orientation, innovation, risk-taking and proactiveness, is positively related to firm performance. In addition, government, economic condition and environmental factors moderate the link of CE and firm performance. From a meta-analysis of CE and performance, Bierwerth et al. (2015) revealed the positive relationship of CE and firm performance. Zahra and Garvis (2000) showed that international CE was positively associated with a firm’s profitability and growth. After examining some Turkish companies, it was found that CE helps to improve firm performance (Aktan and Bulut, 2008; Kaya, 2006; Karacaoglu et al., 2013). Mohamad et al. (2011) found that CE affects firm performance positively in some Indonesian medium-sized manufacturing firms. Ambad and Wahab (2016) concluded that corporate venturing was related to firm growth but not firm profitability in Malaysian large companies. Hanci-Donmez and Karacay (2019) argued that CE mediates the link between high-performance human resource practices and firm performance. Eze (2018) evaluated the effect of CE on non-financial performance of manufacturing firms in Nigeria and found that all parts of CE (innovation, venturing, strategic renewal, proactiveness and risk-taking) are important for improving firms’ market share and employees’ satisfaction. More information of some literature we reviewed above is listed in Table I.

4. Future directions

4.1 Focus on the concept of CE in emerging markets

While all the studies mentioned above further our understanding of the factors that contribute to firm innovation per se, they do not offer a holistic perspective of CE since they do not simultaneously cover the venturing and strategic renewal dimensions of CE, as established in the literature. One exception to this holistic perspective is the study of Guo et al. (2014), in which the authors have investigated a case study of the automobile industry in China and identified how unique organizational capabilities affect CE activities at different stages. In another study, Yiu and Lau (2008) researched the role of non-market forms of capital in an emerging market context – namely, network-based relationships of the firm in political, social and reputational forms on the relationship between CE and firm performance – using innovation and venturing as the pillars of CE.

Despite many calls for research on the CE concept in emerging markets (Zahra, Neubaum and Huse, 2000; Zahra, Ireland, Gutierrez and Hitt, 2000; Bruton et al., 2008), our review shows that scholars have not made much progress in this area, especially when we consider the concept at the holistic level, using the three prongs of entrepreneurship (Zahra, 1996). Mathews (2002) offered an alternative model to explain EMFs internationalization by using linkage, leverage and learning model. Yet, no other theories have been developed to examine which aspects of existing theory are valid, which aspects are not and what to do about the latter to enhance our understanding of EMFs (Ramamurti, 2012). Moreover, existing studies are mainly conducted in countries such as China, India, South Africa and Turkey, leaving more of the emerging economies still untested. Our review suggests that there is huge potential in looking at the drivers of CE and the organizational capabilities that contribute to it (CE) within the context of emerging markets.

4.2 Methodological and theoretical innovation of CE in emerging countries

Empirical studies that focused on CE, in general, used surveys as a primary source of data to measure the CE behavior of a firm. A recent exception to this is the study by Boone et al. (2019), where they measure CE using secondary data sources. While Boone et al.’s study focuses mainly on developed country contexts (such as the USA, Germany, France, the UK
<table>
<thead>
<tr>
<th>Topic area</th>
<th>Authors</th>
<th>Journal</th>
<th>Research methodology</th>
<th>Contexts (regions, countries, etc.)</th>
<th>Findings</th>
</tr>
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<tbody>
<tr>
<td>Institutional environment</td>
<td>Gomez-Haro, Aragon-Correa and Cordon-Pozo</td>
<td><em>Management Decision</em>, 2011</td>
<td>Quantitative study (a questionnaire study of 150 firms in trade, metallurgy, machinery and transportation industries)</td>
<td>Spain</td>
<td>The results show that both the normative and cognitive dimension of the institutional environment influence an organization’s entrepreneurial orientation. They also show that regulatory dimension influences what type of corporate entrepreneurial activity is carried out.</td>
</tr>
<tr>
<td></td>
<td>Judge, Liu-Thompkins, Brown and Pongpatipat</td>
<td><em>Entrepreneurship Theory and Practice</em>, 2015</td>
<td>Quantitative study (secondary data and in-depth phone interviews were conducted. 211 largest MNCs listed in the Global 500 in <em>Fortune</em> magazine in 24 countries were analyzed)</td>
<td>USA, Japan, Germany, China, etc.</td>
<td>The study points to the remarkably strong role of home institutional context for understanding two types of technological entrepreneurship pursued by relatively large, multinational firms. It finds that various national-level dimensions influence different measures of CTE.</td>
</tr>
<tr>
<td>Government policies</td>
<td>Holmes, Zahra, Hoskisson, Deghetto and Sutton</td>
<td><em>Academy of Management Perspective</em>, 2016</td>
<td>Theoretical study</td>
<td>USA, China, Russia, Cyprus, Egypt, Indonesia</td>
<td>It illustrates how technology policies – specifically those related to state funding for research and IP protection – shape firms’ innovation opportunities and constraints, thus affecting their incentives and abilities for CE and political strategies.</td>
</tr>
<tr>
<td></td>
<td>Doh and Pearce</td>
<td><em>Journal of Management Studies</em>, 2004</td>
<td>Theoretical study</td>
<td>Transitional policy environments</td>
<td>It demonstrates how corporations affected by government policy can use entrepreneurial strategies to exploit discontinuities generated by uncertain and unstable public policy environments. Specific strategies will be effective depending on the degree and slope/inflection profile of policy change.</td>
</tr>
<tr>
<td></td>
<td>Guo, Jiang and Yang</td>
<td><em>New England Journal of Entrepreneurship</em>, 2017</td>
<td>Theoretical study</td>
<td>China</td>
<td>It proposes a stage model to explain how governments play different roles to promote firm CE at different times in Chinese automobile industry.</td>
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<tr>
<th>Topic area</th>
<th>Authors</th>
<th>Journal</th>
<th>Research methodology</th>
<th>Contexts (regions, countries, etc.)</th>
<th>Findings</th>
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<tbody>
<tr>
<td>State ownership</td>
<td>Hong, Wang and Kafouros</td>
<td>British Journal of Management, 2015</td>
<td>Quantitative study (626 Chinese firms including 615 manufacturing firms and 11 mining firms and their OFDI)</td>
<td>China</td>
<td>Institutional forces and the internationalization effects of state ownership are contingent upon location- and industry-specific idiosyncrasies. State ownership in an emerging economy enables a firm to obtain crucial R&amp;D resources but makes the firm less efficient in using those resources to generate innovation, and a minority state ownership is an optimal structure for innovation development in this context. And the inefficiency of state ownership in transforming R&amp;D input into innovation output decreases when industrial competition is high.</td>
</tr>
<tr>
<td></td>
<td>Zhou, Gao and Zhao</td>
<td>Administrative Science Quarterly</td>
<td>Quantitative study (a balanced panel of 12,288 manufacturing firms in 31 provinces and 182 industries was analyzed. The 12,288 firms consist of 2,235 SOEs, 647 mixed firms and 9,406 firms without state capital)</td>
<td>China</td>
<td></td>
</tr>
<tr>
<td>Informal institutions</td>
<td>Hall and Maffioli</td>
<td>European Journal of Development Research, 2008</td>
<td>Quantitative study (surveys collected in Chile and Panama and secondary sources of information, such as the innovation and industrial surveys used in Argentina and Brazil)</td>
<td>Latin America and Caribbean countries</td>
<td>Technology development funds’ effectiveness is found to depend on the financing mechanism used, on the presence of non-financial constraints, on firm–university interaction, and on the characteristics of the target beneficiaries. A review paper about the institutions, innovation and international competitiveness of Chinese firms.</td>
</tr>
<tr>
<td>and other external mechanisms</td>
<td>Cheng and Yiu</td>
<td>Long Range Planning, 2016</td>
<td>Theoretical study</td>
<td>China</td>
<td></td>
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<tr>
<td>Market entry decision</td>
<td>Ang, Benischke and Doh</td>
<td>Strategic Management Journal, 2015</td>
<td>Quantitative study (analyzed 673 cross-border acquisition and alliances conducted by EMFs)</td>
<td>Emerging markets</td>
<td>EMFs market entry choices are affected by mimicking home and host country firm behavior and distance between home and host country affects firms’ internationalization. Turkish MNE’s equity composition of foreign subsidiary was affected by political constraints, linguistic distance and level of knowledge infrastructure in host country and parent diversity.</td>
</tr>
<tr>
<td></td>
<td>Demirbag, Tatoglu and Glaister</td>
<td>Journal of World Business, 2009</td>
<td>Quantitative study (522 foreign affiliates of Turkish multinational enterprises (MNEs))</td>
<td>Turkey</td>
<td></td>
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<td>Topic area</td>
<td>Authors</td>
<td>Journal</td>
<td>Research methodology</td>
<td>Contexts (regions, countries, etc.)</td>
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<td>Organizational resources and</td>
<td>Rui and Yip</td>
<td><em>Journal of World Business</em>, 2007</td>
<td>Qualitative study (in-depth interview of three Chinese companies about the strategic intents reflected in internationalization strategies)</td>
<td>China</td>
<td>Chinese firms use cross-border acquisition to acquire strategic capabilities to offset their competitive disadvantages and leverage their firm-specific advantages</td>
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<td>capabilities</td>
<td></td>
<td></td>
<td></td>
<td>China</td>
<td>China firms overcome their liability of outsider status by developing guanxi-like relationships with western partners</td>
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<td></td>
<td>Chen</td>
<td><em>Thunderbird International Business Review</em>, 2017</td>
<td>Theoretical study</td>
<td>China</td>
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<td></td>
<td>Guo, Jiang and Yang</td>
<td><em>Thunderbird International Business Review</em>, 2017</td>
<td>Qualitative study (examined two Chinese automobile firms’ corporate entrepreneurship over time)</td>
<td>China</td>
<td>Chinese firms develop different organizational capabilities at various stages of CE, involving initiation, development and implementation</td>
</tr>
<tr>
<td></td>
<td>Khavul, Pérez-Nordtvedt and Wood</td>
<td><em>Journal of Business Venturing</em>, 2010</td>
<td>Quantitative study (analyzed international new ventures from China, India and South Africa)</td>
<td>China, India, South Africa</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kotabe, Jiang and Murray</td>
<td><em>Journal of Management</em>, 2017</td>
<td>Quantitative study (interviewed 108 senior executives in China)</td>
<td>China</td>
<td>International venturing of EMFs from China, India and South Africa through a process model by which firms synchronize their international venturing by adapting to international customers</td>
</tr>
<tr>
<td></td>
<td>Liu, Jiang, Zhang and Zhao</td>
<td><em>Journal of International Marketing</em>, 2013</td>
<td>Qualitative study (conducted 20 in-depth interviews with senior managers from ten Chinese firms)</td>
<td>China</td>
<td>Strategic flexibility affects EMFs international venturing efforts</td>
</tr>
<tr>
<td></td>
<td>Luo and Tung</td>
<td><em>Journal of International Business Studies</em>, 2007</td>
<td>Theoretical study</td>
<td>Emerging markets</td>
<td>Springboard perspectives in which EMFs use international expansion as a springboard to acquire strategic resources to overcome their latecomer disadvantages</td>
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<td>Topic area</td>
<td>Authors</td>
<td>Journal</td>
<td>Research methodology</td>
<td>Contexts (regions, countries, etc.)</td>
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<tr>
<td>Organization culture, leadership</td>
<td>Luo, Zhao, Wang and Xi</td>
<td>Management International Review, 2011</td>
<td>Quantitative study (analyzed 1,355 Chinese private enterprises’ international venturing)</td>
<td>Emerging markets</td>
<td>Dual strategic intent perspectives in which EMFs exploit firm-specific advantages and mitigate market imperfections in home country through CE activities</td>
</tr>
<tr>
<td></td>
<td>Turroa, Alyarezb and Urbanoa</td>
<td>Entrepreneurship and Regional Development, 2016</td>
<td>Quantitative study (analyzed GEM database for Spain in 2011)</td>
<td>Spain</td>
<td>EMFs' CE can be jointly affected by their internal organizational resources and capability as well as their access to external resources from their home-country institutions and external partners</td>
</tr>
<tr>
<td></td>
<td>Yiu and Lau</td>
<td>Entrepreneurship Theory and Practice, 2008</td>
<td>Theoretical study</td>
<td>Emerging markets</td>
<td>EMFs exploit resource capital configuration and transformation to pursue CE</td>
</tr>
<tr>
<td></td>
<td>Chen, Tang, Jin, Xie and Li</td>
<td>Journal of Product Innovation Management, 2014</td>
<td>Quantitative (analyzed 151 TMT members and CEOs)</td>
<td>China</td>
<td>CE has a mediating role between managers’ leadership style and innovation practices</td>
</tr>
<tr>
<td></td>
<td>Chen and Nadkami</td>
<td>Administrative Science Quarterly, 2017</td>
<td>Quantitative (analyzed 129 Chinese SMEs)</td>
<td>China</td>
<td>CEO dispositions as leadership impact CE</td>
</tr>
<tr>
<td></td>
<td>Hughes and Mustafa</td>
<td>Journal of Small Business Management, 2017</td>
<td>Qualitative study</td>
<td>Kenya</td>
<td>Cultural and contextual factors appear to influence the extent of CE activity</td>
</tr>
<tr>
<td></td>
<td>Shafique and Kalyar</td>
<td>Administrative Sciences, 2018  Journal of Positive Management, 2016</td>
<td>Quantitative study (analyzed 950 SMEs from Pakistan) Qualitative study</td>
<td>Pakistan</td>
<td>Contributes to the role of transformational leadership on CE</td>
</tr>
<tr>
<td></td>
<td>Zbierowski</td>
<td></td>
<td></td>
<td>Poland</td>
<td>Authentic leadership, in addition to the fundamental state of leadership, psychological capital and positive deviance all impact CE positively</td>
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Table I. (continued)
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<tr>
<th>Topic area</th>
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<th>Journal</th>
<th>Research methodology</th>
<th>Contexts (regions, countries, etc.)</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Team- and individual-level studies</td>
<td>Zhang and Jia</td>
<td><em>Human Resource Management</em>, 2010</td>
<td>Quantitative study (analyzed Chinese biotechnology pharmaceutical enterprises)</td>
<td>China</td>
<td>Organizational culture mediates the relationship between high-performance human resource practices and CE</td>
</tr>
<tr>
<td></td>
<td>Ziyae</td>
<td><em>World Journal of Entrepreneurship</em>, 2016</td>
<td>Quantitative study</td>
<td>Iran</td>
<td>Organizational culture moderates the relationship between human resource management and CE</td>
</tr>
<tr>
<td>Performance</td>
<td>Lichtfield et al.</td>
<td><em>Journal of Product Innovation Management</em>, 2018</td>
<td>Quantitative study (analyzed 61 R&amp;D teams)</td>
<td>Turkey</td>
<td>Team identity’s impact on team innovation in cross-functional teams (as innovation relates to CE)</td>
</tr>
<tr>
<td></td>
<td>Liu, Chen and Tao</td>
<td><em>Journal of Product Innovation Management</em>, 2015</td>
<td>Quantitative (analyzed 96 product development teams)</td>
<td>China</td>
<td>Information exchange within teams positively affects innovation (as innovation relates to CE)</td>
</tr>
<tr>
<td></td>
<td>Urban and Wood</td>
<td><em>Journal of Business Economics and Management</em>, 2015</td>
<td>Quantitative (analyzed 187 employees in finance sector)</td>
<td>South Africa</td>
<td>Opportunity recognition behavior of employees is positively related to innovative behavior (as innovation relates to CE)</td>
</tr>
<tr>
<td></td>
<td>Li, Xia and Zajac</td>
<td><em>Strategic Management Journal</em>, 2018</td>
<td>Quantitative study</td>
<td>China</td>
<td>A focal firm’s innovation performance will be enhanced by both its government connections and the innovativeness of its economic stakeholders</td>
</tr>
<tr>
<td></td>
<td>Trong</td>
<td><em>Advances in Management</em>, 2018</td>
<td>Theoretical study</td>
<td>USA, Turkey, Indonesia, Malaysia and China</td>
<td>This is a review paper to find out the relationship between corporate entrepreneurship and firm performance</td>
</tr>
</tbody>
</table>
and Japan), we suggest that using innovative measures such as Boone et al.’s can also open up more research that focuses on CE in emerging market contexts. While using primary sources of data is valuable, methodological innovations using secondary data to identify innovation, strategic renewal and venturing may also allow for more holistic and higher-quality research stemming out of EMFs. Moreover, the literature on CE in EMFs should be more open to case studies. Like secondary data sources, case studies enable the researchers to look into these concepts at a more interconnected level.

Our review also indicates the need to move the field from applying previous theory to developing and testing theory of CE in emerging markets in order to fully comprehended evolutionary development of EMFs, the evolution of institutions, and EMFs’ unique resources and capabilities that have been uncovered in classic theories. This calls for theoretical innovation in CE research, instead of simply comparing EMFs with traditional MNCs. This is because existing theories are inadequate to examine the process-focused and evolutionary development of EMFs (Ramamurti, 2012). We hope new theories will emerge, or that scholars will be able to reconcile, extend and synthesize existing theories to expand our understanding of CE research in emerging countries.

4.3 Quality of research of CE in emerging countries

Our review also reveals that most of the literature that is about CE in EMFs is published in journals that are ranked below A level in the ABDC list. We think that this may be because most of the A-level and above journals still do not consider the research in emerging markets as mainstream. This is an important limitation considering that by 2050 the economies of Brazil, Russia, India and China (the “BRIC” economies) will be larger than that of the USA, Japan, Germany, the UK, France and Italy (Peng, 2018). We suggest that moving forward, mainstream management and entrepreneurship journals should be more open to publishing manuscripts that focus on firms from emerging market contexts.

5. Conclusion and contributions

We conclude by emphasizing two main contributions of our review. First, our literature review of CE in EMFs reveals that, despite an abundance of research on CE looking into the three prongs of CE (innovation, strategic renewal and new venturing) in developed market contexts, there is a scarcity of literature focusing on CE in emerging markets from a holistic perspective. The research on EMFs that focus on CE mainly looks at the concepts of CE individually. We contribute to both the CE and EMF literature by showing that a holistic perspective on CE, where studies look into the role of innovation, strategic renewal and venturing simultaneously, is a huge potential for further studies. Scholars focusing on these areas can research the concept of CE per se in EMFs.

Moreover, our review reveals that scholars need to make an effort to further explore both the macro context and the micro context of CE, or how external and internal environment of the firm impacts CE, especially in emerging markets. Given the unique context of emerging markets, how CE is affected by such factors as formal and informal institutions, governments’ roles, the organizational culture, corporate governance, leadership styles, use of organizational resources, managerial capabilities, employee behavior and what outcome CE brings are all potential areas of study that are still under-researched.

Finally, we also contribute to the literature by showing that this stream of research needs more novel methodologies. Specifically, our review shows that the CE research should also focus on developing novel research methods that not only use secondary sources of information but also include case studies. Given the fast changes in global conditions that can significantly affect CE of EMFs, case studies allow scholars to examine EMFs’ CE in a dynamic manner through stage models. Longitudinal case studies...
will also enable the researchers to carve out the processes that EMFs use to foster CE. In addition, longitudinal research designs, in general, will enable future research to examine the CE process within the context of the institutional, technological and industrial evolution of emerging markets.

Notes
1. E20 countries include Argentina, Brazil, Chile, China, Columbia, Egypt, India, Indonesia, Iran, Malaysia, Mexico, Nigeria, the Philippines, Poland, Republic of Korea, Russia, Saudi Arabia, South Africa, Thailand and Turkey.


References


Appendix 1

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<tr>
<th>ABDC</th>
<th>Journal name</th>
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<tbody>
<tr>
<td>A*</td>
<td>Journal of Economic Literature</td>
<td>8</td>
</tr>
<tr>
<td>A*</td>
<td>Academy of Management Review</td>
<td>7</td>
</tr>
<tr>
<td>A*</td>
<td>Academy of Management Journal</td>
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Table AI. Articles from ABDC journal list
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**Appendix 2**

**Corresponding author**

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Abstract

Purpose – The purpose of this paper is to examine innovative practices and emphasize the mechanism of knowledge transfer across knowledge boundaries. By comparing and discussing the emerging boundary issues in knowledge transfer among small- and medium-sized enterprises (SMEs) registered in the incubation centers in China, this paper identified the main knowledge transfer approach and several contextual and organizational factors impacting knowledge transfer.

Design/methodology/approach – The authors conduct 39 semi-structured in-depth interviews with employees working within business incubation centers in China. The study uses thematic analysis for data analysis.

Findings – Our results contribute to the literature of knowledge transfer and in particular to our understanding of boundary conditions and knowledge transfer approaches in emerging economies. The results also highlight several contextual and organizational factors which impact knowledge transformation across the pragmatic boundary in the context of China.

Practical implications – First, organizations need to establish an effective process with tools to accommodate novelty; second, organizations should be aware of the impact of entrepreneurial orientation on innovative performance; and third, it will help organizations if they adopt and integrate information-rich media in managing innovative practices.

Originality/value – This research highlights the impact of contextual and organizational factors of SMEs on knowledge transfer in emerging markets and chooses incubation centers as study subjects, which is an organizational context that has not been thoroughly studied due to its unique nature and emerging complexity.

Keywords Knowledge transfer, SMEs, China, Entrepreneurial orientation, Rich media, Pragmatic boundary

Paper type Research paper

Introduction

The issue of boundaries has been regarded as a vital factor in examining knowledge transfer in organizational studies (Hansen, 1999; Lank et al., 2008). The burgeoning literature has addressed the importance of managing knowledge across boundaries in driving innovation and organizational success (Nonaka, 1994; Leonard-Barton, 1995; Davenport and Prusak, 1998). Much of the existing literature focuses on categorizing and gauging the complexity of a boundary and describing the properties of boundaries to
resolve the incompatibilities among the different approaches to obtain knowledge and to cross boundaries in organizations (Dick et al., 2017; Carlile, 2002; Argote, 1999; Dougherty, 1992). The literature highlights that the knowledge transfer approach has to match the boundary condition in order to create new knowledge efficiently (Huber, 1991; Hargadon and Sutton, 1997; Carlile, 2002, 2004). This issue becomes more challenging in emerging economies where there is a high degree of uncertainty and risk taking in a volatile business environment. However, little is known about the particular types of boundary conditions and knowledge transfer approaches relevant in emerging economies, as most studies have examined knowledge practices in developed economies (Guennif and Ramani, 2012; Grimpe and Sofka, 2016; Lee et al., 2010; Jiang and Li, 2009; Milagres and Burcharth, 2019). Research calls for in-depth understanding of complex boundary conditions and knowledge transfer approach in emerging economies, and in particular the impacting factors on knowledge transfer across boundaries.

This study aims to understand the boundary conditions that foster knowledge transfer within business incubation centers in China. It examines innovative practices and emphasizes the mechanism of knowledge transfer across boundary conditions. By comparing and discussing the emerging boundary issues in knowledge transfer among small- and medium-sized enterprises (SMEs) registered in the incubation centers in China, this study identified several contextual factors that impact boundary conditions with a focus on shared value and interests, and trust. This study also examined two important organizational factors, SMEs’ entrepreneurial orientation and the use of information-rich media, to investigate how they impact knowledge transfer across boundaries.

For the following reasons, this research is set in China, a unique context of emerging economy. First, most studies on knowledge transfer across boundaries have focused on developed economies, and only limited research has been conducted to understand the patterns in emerging economies such as China (Guan et al., 2009; Lin, 2018). Second, the unique market and political context in China is worth the investigation of knowledge transfer in collaborative innovation projects. For instance, the Chinese government has established numerous national technology development zones and business incubators across the country (Zhang et al., 2009). However, China is regarded as a volatile business environment, in particular considering its intense competition of skilled workers (Newman et al., 2011), lingering intellectual property (IP) issues (Hu and Jefferson, 2009), limited knowledge base of firms (Awate et al., 2012) and high risk involved in innovative activities (Wu, 2007).

Establishing business incubation centers is a crucial strategy to help Chinese SMEs understand and manage these challenges. It also demonstrates that China has intensified its efforts to make its economy globally competitive, striving to improve technological and innovation capacity. For example, the Chinese government has encouraged SMEs to increase their technological capacity by collaborating with research labs and partners in business incubation centers, especially within designated technology development zones (Wu, 2007). Central, provincial and local governments offer companies perks such as free or reduced rent, tax holidays and even direct subsidies to locate research operations in specific locations in China. The rationale for selecting business incubation centers as the site for this study is related to the purpose of the research. First, there are still few studies examining business incubation centers as one of the complex and emerging organizational sectors (Rice, 2002), an area worth examining in the field of knowledge management studies. Second, the managerial committees of the studied incubation centers employ highly specialized personnel who work in structurally differentiated departments. This high level of structural differentiation has led to boundary challenges in the context of collaborative programs (Bess and Dee, 2008; Kezar and Lester, 2009). Third, comparing knowledge flow and practices in business incubation centers located at different regions in China provides
first-hand empirical data for examining boundary issues and the impact of SME features on knowledge transfer across boundaries in emerging economies. Building upon previous scholarly discussion on knowledge transfer across boundaries and combining this with insights from the entrepreneurship literature, we aim to provide answers to the following research questions:

RQ1. What types of boundaries and knowledge transfer are relevant in the context of collaborative innovation in emerging markets?

RQ2. What factors contribute to knowledge transfer given the identified boundary conditions in the emerging markets?

To obtain empirical data to support our research questions, we undertook three separate field visits to incubation centers and conducted in-depth interviews of the SMEs employees and staff. Our results contribute to the literature of knowledge transfer and in particular to our understanding of the relationship between boundary conditions and knowledge transfer in emerging economies. The results highlight the role of organizational factors and contextual factors in influencing knowledge transfer in the cultural context of China. In particular, we found that shared values and interests help build trust among different actors (both within a company and across companies located in the same incubation centers) to facilitate the knowledge transfer process across pragmatic boundaries. Furthermore, we found that the entrepreneurship orientation of SMEs in China and their use of information-rich media positively impact the knowledge transfer as well. The findings illustrate the specific business environment and dynamic of business incubation centers in emerging markets.

**Knowledge transfer across boundaries**

Knowledge transfer is an intricate process through which an organization purposefully learns from another (Milagres and Burcharrth, 2019). It consists of a series of sub-processes including search, access, assimilation and integration. Understanding knowledge transfer helps organizations to design a better strategy to respond to growing uncertainties in the market, the intensified globalization, and the increase in research and development complexity and costs (Powell *et al.*, 1996; Argote and Ingram, 2000).

There have been accumulated studies on different approaches to manage knowledge transfer across boundary conditions to achieve innovation (Jantsch, 1980; Carlile, 1997, 2002, 2004; Inkpen and Tsang, 2005). Scholars have identified three progressively complex boundary conditions: syntactic, semantic and pragmatic (Carlile, 2004). The first is the syntactic approach, which argues that it is crucial to establish a shared and stable syntax to process information across a given boundary (Galbraith, 1973). The syntactic approach to boundary spanning is the dominant one in conventional organizational research, built upon the assumption that more information and communication is always better for knowledge transfer (Brown and Eisenhardt, 1995; Ancona and Caldwell, 1992). Compared to the traditional syntactic approach, a semantic approach recognizes the need that individual, context-specific aspects of creating and transferring knowledge must be taken into consideration (Dougherty, 1992; Nonaka and Takeuchi, 1995). For instance, Nonaka (1994) emphasizes the generation of “mutual understanding” through interactions among communities. This makes tacit knowledge explicit across boundaries when people walk through semantic differences.

The third approach is the one that we apply to this study, a pragmatic approach. It highlights the importance of understanding the differences in practices of actors that are involved in knowledge transfer and their consequences, which may generate additional costs (Carlile, 2004; Van Der Meer *et al.*, 2013). The pragmatic approach highlights that knowledge is embedded and localized in practices, which builds upon the insights from
Polanyi that tacit knowledge resides in the doing of the activity. It also assumes that the conditions of difference, dependence and novelty are all present and required in an overall process for transforming existing knowledge (Carlile, 1997; Schrage, 1999; Iansiti, 2000). Therefore, the pragmatic boundary is the most complex one within which innovative or creative outcomes are desired. To effectively manage knowledge transfer across pragmatic boundaries calls for a more engaged and deeper sharing, rather than a simple transfer or translation of knowledge between different contexts. In another words, knowledge needs to be actively transformed to better suit the specific situation (Carlile and Rebentisch, 2003).

These boundaries can be navigated through three increasingly complex knowledge processes: transfer, translation and transformation (Carlile, 2002; Bechky, 2003). These distinctions also specify that the level of novelty in a situation affects the type of boundary conditions. Novelty refers to the amount of newness or unfamiliarity that individuals perceive in a situation (Carlile, 2004). As the level of novelty in the situation increases, boundary issues become more complex and difficult to address. While pragmatic boundaries are likely related to high levels of novelty, moderate and low levels of novelty are associated with semantic and syntactic boundaries, respectively. The discussions on pragmatic boundaries recognize that managing knowledge transfer across such boundaries needs to create new knowledge; as a result, current knowledge used at the boundary has to be negotiated and transformed. Developing and maintaining a complex process of transforming knowledge can be challenging to organizations as they need to be able to identify and represent differences and dependencies between actors at the boundaries.

Crossing pragmatic boundaries requires all actors to identify the differences and dependencies, negotiate alternatives at the boundary and then collectively transform the knowledge currently being used in new ways for solution development (Carlile, 2002, 2004). Guided by the same perspective, Tippman et al. call for a repetitive and iterative approach to build boundary capacity. This process involves trying new alternatives, testing knowledge and accepting that some knowledge may be abandoned (Carlile, 2004). Therefore, the knowledge used at pragmatic boundaries becomes a “transformed mixture” of the knowledge deemed valuable and of consequence to the specific situation (Carlile, 2004, p. 559). This process may involve negotiation of trade-offs among different actors.

The literature highlights that the knowledge transfer approach has to match the type of boundary in order to create new knowledge efficiently. However, it is not unusual to observe a mismatch between a pragmatic boundary and a transfer approach for both political and practical reasons (Huber, 1991; Hargadon and Sutton, 1997). When novel conditions arise, individuals often intend to re-use their current knowledge because of the strong pressure toward efficient work. Under these circumstances a mismatch often occurs because novelty is hard to recognize and costly to represent. This mismatch between types of boundary and approach goes deeper when one group recognizes novelty on their side but cannot represent its consequences to the other side. This type of practical breakdown often leads to a political breakdown at the boundary (Carlile, 2002, 2004). Groups would need to create and explore the gap of knowledge, where practical and political abilities go hand in hand in transforming knowledge and generating new knowledge at a boundary. This issue becomes more challenging in emerging economies where there is a high degree of uncertainty and risk taking in innovative practices in a volatile business environment. Therefore, we examine the following research question:

RQ1. What types of boundaries and knowledge transfer are relevant in the context of innovative activities in emerging markets?

Factors influencing knowledge transfer across boundaries
Knowledge transfer involves the migration of knowledge between different organizational actors (Beamish and Berdrow, 2003). It is essentially a multilevel phenomenon. The literature
has identified a variety of factors that would influence knowledge transfer across boundaries. At the macro level, studies have focused on factors including industrial characteristics and policy, competition policies, macroeconomic policies, and IP regime and price regulations (Guennif and Ramani, 2012; Grimpe and Sofka, 2016). At the inter-organizational level, literature has examined how motivations behind knowledge sharing alliances (e.g., cost sharing and synergy seeking), partnership structure (equity based or non-equity based) and contract form and scope affect knowledge transfer (Lee et al., 2010; Jiang and Li, 2009). At the individual level, characteristics of people who engage in knowledge transfer could also influence knowledge transfer (e.g., their motivations, cognitive styles, emotions, learning behaviors, and individual absorptive capacity and resistance) (Milagres and Burcharth, 2019). In addition, studies have examined how contextual factors and organizational level factors influence knowledge transfer. In the following section, we provide a review of these key factors and connect the literature to the crossing of pragmatic boundaries and to the context of emerging markets.

**Contextual factors**

Knowledge transfer occurs among organizational actors engaged in different types of networks including intra-firm networks, strategic alliances and industrial districts (Inkpen and Tsang, 2005). Companies located in a business incubator center can be viewed as actors in an industrial district, which is “a network comprising independent firms operating in the same or related market segment and a shared geographic locality, benefiting from external economies of scale and scope from agglomeration.” Given the specific environment these companies are embedded in, a series of contextual factors need to be accounted for when analyzing how these companies can tap into a larger knowledge resource base for knowledge transfer.

In the context of industrial districts, knowledge of primary interest is highly tacit, difficult to replicate and not easily purchased (Inkpen and Tsang, 2005). To start with, shared values and interests can facilitate knowledge transfer (Maas et al., 2016). Shared understanding of values and interests among different stakeholders (e.g., coworkers, suppliers, clients, partner organizations, etc.) helps to reduce the large cognitive distance between two parties that may create barriers to communication and the transfer of knowledge from one group to another (Sturdy et al., 2009). At the pragmatic boundary, it clarifies dependencies between domain-specific areas and provides a means for making trade-offs between different interests (da Silva et al., 2017). In addition, it helps to build shared perceptions of mutual benefits (Hong and Nguyen, 2009).

Another contextual factor is trust among stakeholders involved in the knowledge transfer process (Zhang, 2019; Hsu and Chang, 2014; Chou et al., 2014). It captures the relational aspect of knowledge transfer. Trust is defined as “the conviction and belief in another party in a risk situation in which the possibility of opportunistic behavior exists (Milagres and Burcharth, 2019, p. 40). As an outcome of the relationship between actors and the institutional context, trust affects how much time different actors are committed to the process, and their disposition to take risks (Inkpen and Tsang, 2005). When crossing pragmatic boundaries, trust is an evolutionary element of the knowledge transfer process, meaning that it will evolve as stakeholders engage in interactions and negotiations (Inkpen and Currall, 2004). The presence of trust will minimize the need for control by a particular party, facilitate mutual understanding and foster cooperation (Dyer and Nobeoka, 2000; Mellewigt et al., 2007).

Developing trust and developing shared interests and values are interconnected, as a higher level of trust could lead to shared understanding of mutual interests, and vice versa (Obal, 2013; Seppänen et al., 2007). Both involve a process that is built upon mutual understanding and good will from all parties that are involved in knowledge transfer. These two factors
become more relevant in emerging markets where there are constricting regulations, inefficiencies and uncertainties. In the context of China, they are crucial as it is a country where guanxi is embedded in the culture. Guanxi is viewed as interpersonal bonds that are cultivated through long-term relationship building to create certain expectations and duties in daily interactions, business activities and organizational behaviors (Wang et al., 2012). Existing literature about Chinese firms has found that in situations where there is a highly trustful relationship or there is perceived shared understanding of interests and common values, parties are more willing to engage in social exchange and cooperative interactions such as knowledge transfer (Wang et al., 2012; Qian et al., 2019).

**Organizational factors**

Another set of factors that could influence knowledge transfer is the organizational factor. This section draws from the literature on pragmatic boundary and knowledge transfer and focuses on two important aspects: a firm’s characteristics and its use of information-rich media. Both factors are connected to a firm’s proactiveness in initiating and engaging knowledge transfer. To begin with, a fundamental firm-level characteristic is the degree to which a firm is strategic in making decisions related to enacting organizational purposes, achieving its vision and creating competitive advantages (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003; Venkatraman, 1989; Covin and Slevin, 1991). Literature has conceptualized this factor as entrepreneurial orientation, which allows firms to “reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516). It is an important driver of product development and reformulation, innovation in manufacturing and channel design, new approaches to competitive strategy and firm performance (Cowden et al., 2016).

As a multi-dimension concept, entrepreneurial orientation captures a firm’s innovativeness, risk taking and proactiveness (Fadda, 2018; Miller, 1983; Burgelman, 1984; Hart, 1992; MacMillan and Day, 1987; Venkatraman, 1989). Innovativeness refers to engaging in creativity and experimentation through the introduction of new products/services as well as technological leadership via R&D in new processes; risk taking involves taking bold actions by venturing into the unknown, borrowing heavily and/or committing significant resources to ventures in uncertain environments; proactiveness is an opportunity-seeking, forward-looking perspective characterized by the introduction of new products and services ahead of the competition and acting in anticipation of future demand. Lumpkin and Dess (1996) added two more dimensions to entrepreneurial orientation: competitive aggressiveness and autonomy. Competitive aggressiveness refers to the intensity of a firm’s effort to outperform rivals by aggressively responding to competitive threats and holding a strong offensive posture; autonomy refers to independent action undertaken by entrepreneurial leaders or teams to bring about a new venture. However, there has been debate in the literature concerning the conceptualization of entrepreneurial orientation. Some scholars argue that the construct is best viewed as unidimensional (e.g. Knight, 1997; Lee et al., 2001; Naman and Slevin, 1993; Walter et al., 2006; Wiklund and Shepherd, 2003), and consequently, the different dimensions of entrepreneurial orientation should relate to performance in similar ways. On the other hand, some researchers argue that the dimensions may relate differently to a firm’s performance (Stetz et al., 2000), as each dimension represents a different and independent aspect of the multidimensional concept of entrepreneurial orientation.

Firms with high entrepreneurial orientation need to make strategic decisions, which involve risk taking and allocation of scarce resources (Pfeffer and Sutton, 2006; Rousseau, 2006). However, the effect of entrepreneurial orientation may differ considering the dynamic cultural and social environment of emerging markets (e.g. Knight, 1997; Thomas and Mueller, 2000). The effect of entrepreneurial orientation has been mainly examined in the North American context (Miller, 1983; Lumpkin and Dess, 1996). It raises the question as to whether entrepreneurial orientation indeed leads to more willingness to engage in knowledge transfer.
In the emerging economic environment, which features uncertainty and risk taking, China provides a potential cultural context to examine how entrepreneurial orientation affects knowledge transfer. SMEs in China need to constantly seek out new opportunities responding to fast changing and volatile business environments, and the government plays a specific role in this dynamic environment (Guo et al., 2017). As a result, firms may benefit from a high degree of entrepreneurial orientation as they are more likely to engage in innovative activities while taking risks in marketing strategies (Miller and Friesen, 1982). Research has also identified that firms with high EO are more adaptive and tend to outperform other organizations in volatile environments (Farja et al., 2016; McKee et al., 1989; Covin and Slevin, 1991; Miller and Friesen, 1984).

Another organizational factor is the communication technology use, which has been found to positively influence knowledge transfer through the support of knowledge sharing and distribution, and interpersonal communication, and in particular in handling tacit knowledge. In organizational settings, knowledge transfer involves the processing and transfer of information to reduce uncertainty and equivocality. Uncertainty describes the challenging situation of organization due to the absence of information and equivocality refers to the existence of multiple and conflicting interpretations about an organizational situation (Daft and Lengel, 1986). Different communication technologies carry different level of information richness, defined as “the ability of information to change understanding within a time interval” (Daft and Lengel, 1986, p. 560). Rich communication media can overcome different frames of reference or clarify ambiguous issues to facilitate understanding in a timely manner, while communication media low in richness requires a long time to enable understanding or it cannot overcome divergence of perspectives (Daft and Lengel, 1986).

The impact of communication technology use on knowledge transfer should be studied in specific contexts (Daft et al., 1987; Schmitz and Fulk, 1991; Kock, 2005). We argue that the effect of media richness on knowledge transfer is relevant to crossing the pragmatic boundary which requires a shared syntax, individual ability and multiple interaction (Maznevski and Chudoba, 2000; Klitmøller and Lauring, 2013). For example, Ahmad et al. (2018) found that SMEs make a proactive choice to adopt social media as it helps entrepreneurs to redefine their goals clearly and to obtain information that would not be available otherwise. Media of low information richness (such as written or text-based media) are suitable for the exchange of explicit knowledge (such as pure fact or codified information) while rich media (such as face-to-face meetings, synchronous media like telephone and live chat and social media platforms) are more effective when exchanging tacit knowledge and can even help transform tacit knowledge to explicit knowledge (Herschel et al., 2001; Panahi et al., 2012; Murray and Peyrefitte, 2007; Rice and Shook, 1990). In the setting of knowledge transfer in emerging economies, unpacking how media richness influences knowledge transfer across boundaries helps with our understanding of communication challenges and how to handle the expected uncertainty and equivocality (Grover and Davenport, 2001).

After reviewing how both contextual factors and organizational factors could influence knowledge transfer in emerging markets with high uncertainty and risk taking, we propose the following research question:

**RQ2.** What factors could facilitate knowledge transfer given the identified boundary conditions in emerging markets?

**Method**

**Research site**

This study addresses the boundary issues that emerge in knowledge transfer by examining SMEs registered in the business incubation centers. To explore how knowledge transfers
across boundaries through collaborative programs, two incubation centers were chosen: the Suzhou Industrial Park (SIP) incubation center in Suzhou and the Zhongguancun Science Park incubation center (ZGC) in Beijing. These two were selected as the case study sites mainly because: they represent nationally recognized innovation development zones in China; Zhongguancun Science Park is considered to be the most successful one in China, while SIP was established through international government-to-government collaborations between Singapore and China; they are in different regions of China, representing the Beijing–Tianjin–Tangshan Industrial zone and Southern/Yangtze river delta economic development zone; and there are significant differences between the two incubation centers in terms of their approaches to knowledge transfer practices and management.

Zhongguancun Science Park incubator is a business incubator under the municipal governance of Beijing (the capital city of China). This incubator had started an innovation-and-collaboration program (IAC) to engage in a strategic planning process that sought to strengthen collaboration and innovation, as strategic planning processes are likely to stimulate the knowledge transfer associated with organizational learning, and reveal blockages and impediments to such transfers (Vaara and Whittington, 2012). The other incubation center studied is located at SIP. The management committee of this incubation center initiated a one-stop service unit to provide multiple services to SMEs registered in the incubator.

Data collection
The researchers made three field visits to Beijing and Suzhou respectively to gather documents and information from the studied incubation centers and other sources. We followed previous studies which define SME as a size between 10 and 500 employees. We invited managers from the management committee of incubation centers and SMEs registered in the incubation centers to participate in this research project. We conducted 39 interviews through both phone and face-to-face format.

We conducted semi-structured interviews in two stages. In the first stage, we gained in-depth insights by interviewing managers and key employees of SMEs operating in the incubation centers, and important stakeholders including employees of other local companies operating in the incubation centers, officials working for the incubation centers, and government officials from local districts. In total, 19 face-to-face interviews with managers from SMEs and the management committee of the incubation center were conducted during three visits to the studied incubation centers. The main purpose of this round of interviews was to understand the innovative programs and practices of business incubation centers at different locations and explore the boundary issues of knowledge transfer. In the second stage, to gather insights on knowledge transfer of SMEs registered in studied incubation centers, we collected data by interviewing 20 managers from SMEs in the two incubation centers over a subsequent four months period. For instance, we invited interviewees to describe their experiences collaborating with the management committee of the business incubator, in particular the experiences of participating in innovative programs supported by the business incubators. We also asked the participants questions including their daily practices to learn new knowledge and manage knowledge through collaborations with the incubation center, barriers of knowledge practices, as well as their perceptions of the context of incubation centers, etc.

The sampling approach at both stages was purposive and through personal networks and snowball sampling (Noy, 2008). Interviewees were invited and identified on a voluntary basis. This allowed us to select participants from a range of different industries and sectors, as well as different roles. Among the interviewees, the roles include founders, CEOs, marketing and business development managers, project managers, public relation manager, government relations managers, as well as managers working at the incubator
management committee. In total, 30.76 percent ($n = 12$) were female while 69.23 percent ($n = 27$) were male. Regarding interviewee education level, 5.12 percent ($n = 2$) held an EMBA, 28.20 percent ($n = 11$) held a master’s degree/MBA, 48.71 percent ($n = 19$) held bachelor degrees and 17.95 percent ($n = 7$) had diplomas. Regarding interviewee age, 2 were under 25 years old, 12 between 25 and 35 years, 12 between 35 and 45 years old, 13 between 45 and 55 years old and 0 were above 65 years old. We tried to maximize variation of interviewee’s backgrounds in order to obtain a rich view of managers working in the incubation center. Interviews lasted between 60 and 90 min and all were recorded and transcribed. The interviews were conducted in Chinese or English, as chosen by the interviewees so they could better express their thoughts with their mother tongues. Those interviews conducted in Chinese have been translated into English and transcribed.

**Data analysis**

The data gathered from interviews were analyzed and categorized using a qualitative, thematic analysis method (Strauss and Corbin, 1994) with NVivo software. We conducted the data analysis using a “systematic” combining of both inductive and abductive steps (Dubois and Gadde, 2002; Strauss and Corbin, 1994). While a reasonable conclusion was drawn from inductive steps of data analysis, abductive steps characterized as inference to the best explanations led researchers to refer to an appropriate premise such that the conclusion is a valid consequence of the given premise.

We examined the interview transcripts and conducted a process of open coding of the data. During the first round of coding, we identified a number of themes were identified associated with boundary conditions and knowledge across boundaries. In the second round of coding, we reduced the themes by combining similar themes and using more abstract and analytic categories. We identified numerous impacting factors on knowledge across boundaries. Those themes include “shared culture,” “mutual interest,” “trust,” “localized,” “risk taking,” “forward thinking,” “active creativity,” “entrepreneurial spirit,” “dialogs” “multiple interactions,” etc. In the third step, we matched all of the identified themes against theoretical concepts through the process of abduction to develop a list of third order themes. For instance, we identified pragmatic boundary by contrasting and analyzing the second order themes associated with boundary conditions which include high level of novelty, differences and interdependence. We also categorized and identified a few contextual and organizational factors which impact knowledge across pragmatic boundaries (Table I).

**Results**

This study identified 29 cases of knowledge transformation from the interview data. See Table II for the detailed coding of these cases. We summarize three main findings from the data analysis. First, we found that pragmatic boundary is the main boundary condition associated with knowledge transformation in the context of business incubation centers in China, considering the novelty, dependence and differences presented at the knowledge boundary. Second, we found that contextual factors including shared value and interests and trust facilitate knowledge transformation across pragmatic boundaries. Third, we found a number of organizational factors impacting knowledge transformation. In the following sections, we discuss these findings in detail (Figure 1).

**Pragmatic boundary in business incubators in the context of China**

The data shed light on RQ1 regarding which types of boundaries and knowledge transfer are relevant in the context of business incubation centers in emerging markets. From the interview data, several themes emerged to describe the knowledge boundary from the practices of business incubators. The key themes include “newness,” “novelty,” “learning,”
negative consequences,” “solution development,” etc. These themes describe the high novelty as a main feature of boundary condition faced by actors engaged in knowledge transfer practices. As an interviewee from the management committee of the incubation center at the Suzhou Industry Park put it:

Those SMEs registered at our incubation center might have limited capacity to gather new sources and knowledge in some highly specialized areas, e.g. high-tech, industry, regulation and policy. As an information hub and service unit, our one-stop service program of the incubation center collaborated with firms to start their practices in this incubation center in an innovative and effective manner. (Interviewee 7, staff from the management committee of incubation center)

As described, the one-stop service program was established to provide knowledge services to help SMEs navigate their innovative activities in business incubators. It could be costly for SMEs to develop their new knowledge in certain highly specialized areas, in particular regarding procedure, policy, technology and professional knowledge. SMEs need to face high novelty at a knowledge boundary which incurs not only the cost of learning about what is new, but also the cost of adjusting or transforming their “current” ways of doing things (e.g. based on the existing knowledge and practices) to accommodate the novelty at a boundary (e.g. how to register and operate in the studied incubation center). In other words, it requires the actors to try new alternatives and put their current knowledge “at stake” as some of the knowledge may need to be changed or abandoned to cross pragmatic boundaries.

Table I.
Summary of thematic coding

<table>
<thead>
<tr>
<th>Activity</th>
<th>Purpose</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induction:</td>
<td>Open coding of all data to identify themes associated with boundary</td>
<td>Locations: Beijing/Suzhou</td>
</tr>
<tr>
<td>First order themes</td>
<td>conditions and types of knowledge across two locations</td>
<td>Emerging themes include Knowledge boundaries, knowledge transfer, sharing of knowledge, collaborative projects, creativity, innovation, novelty, different types of knowledge, learning, practices, knowledge replacement, assessing knowledge, consequences, connections of knowledge Context, shared value, understanding, trust, relationship, common interests, multiple interactions, cross-functional interactions, team interactions, face-to-face communication, reduce uncertainty, local, embedded Innovative project, creative activity, forward looking, risk taking, proactiveness, aggressiveness</td>
</tr>
<tr>
<td>Induction:</td>
<td>Identification of second order themes describing the characteristics of</td>
<td>Knowledge boundary: novelty (low – high), differences in types of knowledge (low – high), dependence in knowledge (low – high) Knowledge transfer: representing – learning – transforming Local knowledge, embedded, community practice, context, cultural context Contextual factors: localized, shared value, trust, mutual understanding, multiple interactions Organizational factors: active and forward thinking, risk taking, entrepreneurial spirit, rich dialogs</td>
</tr>
<tr>
<td>Second order themes</td>
<td>boundary conditions and impacting factors on knowledge across boundaries</td>
<td></td>
</tr>
<tr>
<td>Abduction:</td>
<td>Comparison of second order themes to theoretical constructs</td>
<td>Boundary conditions – pragmatic boundary – high novelty Knowledge transfer – information processing/knowledge translation/knowledge transformation Localized, embedded, shared value and context, differences in knowledge, dependence Entrepreneurial orientation and spirit – novelty at the pragmatic boundaries Information-rich media, multiple interactions – knowledge transformation at pragmatic boundaries</td>
</tr>
<tr>
<td>Case</td>
<td>Location</td>
<td>Description of condition of knowledge boundary</td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Case 1: participating in ZGU incubator innovative program, and creating a new corporate communication platform</td>
<td>ZGU incubation center</td>
<td>Novelties (new technology), dependence between ZGU and the SME, differences in knowledge practices</td>
</tr>
<tr>
<td>Case 2: application of AR technology in new product</td>
<td>ZGU incubation center</td>
<td>Novelties (new technology), dependence between the SME and local technology provider, differences in interests</td>
</tr>
<tr>
<td>Case 3: collaborating with ZGU to set up a student internship program</td>
<td>ZGU incubation center</td>
<td>Novelties (new process), dependence between the SME and the management committee, differences between existing and new practices</td>
</tr>
<tr>
<td>Case 4: participating in ZGU innovative program and creating a new employee award program</td>
<td>ZGU incubation center</td>
<td>Novelties (new process), dependence between the SME and the management committee, differences between existing and new practices</td>
</tr>
<tr>
<td>Case 5: collaborating with a local university (in Zhongguancun) for AI simulation project</td>
<td>ZGU incubation center</td>
<td>Novelties (high-technology), dependence between the university lab and the SME, differences in the knowledge domain</td>
</tr>
<tr>
<td>Case 6: introducing a new ads framework to local partner</td>
<td>ZGU incubation center</td>
<td>Novelties (new idea), dependence between the SME and local partner; differences in practices</td>
</tr>
<tr>
<td>Case 7: adopting a new employee appraisal system which was introduced by management consultant</td>
<td>ZGU incubation center</td>
<td>Novelties (new system), dependence between the SME and local partner; differences in knowledge domain and practices</td>
</tr>
<tr>
<td>Case 8: collaborating with municipal IPR association to promote IPR in the industry</td>
<td>ZGU incubation center</td>
<td>Novelties (knowledge), dependence between the SME and local partner; differences in knowledge domain</td>
</tr>
<tr>
<td>Case 9: an experiment to apply AI technology in robots design</td>
<td>ZGU incubation center</td>
<td>Novelties (technology and knowledge), dependence between different units of the company; differences in knowledge domain</td>
</tr>
<tr>
<td>Case 10: introducing flexible working schedule to employees</td>
<td>ZGU incubation center</td>
<td>Novelties (process and practices), dependence between different units; differences in practices</td>
</tr>
<tr>
<td>Case 11: developing a media campaign on new product</td>
<td>ZGU incubation center</td>
<td>Novelties (idea), dependence between different departments of the company; differences in practices</td>
</tr>
<tr>
<td>Case 12: doubling product manufacturing plan due to introduction of new technology</td>
<td>ZGU incubation center</td>
<td>Novelties (technology), dependence between manufacturing and sales team; differences in knowledge domain</td>
</tr>
</tbody>
</table>

Table II. Cases of knowledge transformation (continued)
<table>
<thead>
<tr>
<th>Case</th>
<th>Location</th>
<th>Description of condition of knowledge boundary</th>
<th>Influencing parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 13: implementing a new marketing strategy</td>
<td>ZGU incubation center</td>
<td>Novelty (idea), dependence between the SME and ZGU; differences in practices</td>
<td>Proactive, risk taking; face-to-face meetings, conversations, social media and WeChat</td>
</tr>
<tr>
<td>Case 14: developing a new energy technology</td>
<td>ZGU incubation center</td>
<td>Novelty (technology), dependence between the SME and local government; differences in practices and interests</td>
<td>Proactive, risk taking, forward thinking; face-to-face meetings and conversations, social media</td>
</tr>
<tr>
<td>Case 15: participating in a new material experiment</td>
<td>ZGU incubation center</td>
<td>Novelty (technology), dependence between the SME and university lab; differences in knowledge domain and practices</td>
<td>Proactive, forward thinking, risk taking; visual meetings, face-to-face meetings, interpersonal conversations, social media, live chat</td>
</tr>
<tr>
<td>Case 16: collaborating with municipal communication department to develop a new cellphone program</td>
<td>ZGU incubation center</td>
<td>Novelty (knowledge), dependence between the SME and the local partner; differences in knowledge domain and interests</td>
<td>Risk taking, forward thinking; face-to-face meetings, visual meetings; in-depths conversations, social media and live chat</td>
</tr>
<tr>
<td>Case 17: testing a mobile phone feature collaborating with a local partner</td>
<td>SIP incubation center</td>
<td>Novelty (knowledge), dependence between the SME and the local partner; differences in practices and interests</td>
<td>Forward thinking, proactive; face-to-face meetings, visual meetings; conversations, social media</td>
</tr>
<tr>
<td>Case 18: participating in SIP incubator innovation program, and developing a new cellphone app</td>
<td>SIP incubation center</td>
<td>Novelty (technology), dependence between the SME and local partner; differences in practices and interests</td>
<td>Proactive, competitive, forward thinking; face-to-face meetings; conversations, social media, e.g. WeChat</td>
</tr>
<tr>
<td>Case 19: developing new packaging of products</td>
<td>SIP incubation center</td>
<td>Novelty (knowledge), dependence among the different departments; differences in practices and knowledge domain</td>
<td>Proactive, risk taking; face-to-face meetings, visual meetings; regular conversations, WeChat and other social media</td>
</tr>
<tr>
<td>Case 20: developing new communication plans for clients in other cities</td>
<td>SIP incubation center</td>
<td>Novelty (idea), dependence among different departments; differences in practices and knowledge domain</td>
<td>Proactive, competitive; visual meetings, telephone meetings, regular conversations of phone and through social media</td>
</tr>
<tr>
<td>Case 21: testing a new software development collaborating with local university labs</td>
<td>SIP incubation center</td>
<td>Novelty (technology and knowledge), dependence between the SME and local research lab; differences in knowledge domain and practices</td>
<td>Risk taking, cost; face-to-face meetings, visual meetings; regular conversations, and social media</td>
</tr>
<tr>
<td>Case 22: upgrading product responds to the needs of consumers from Chinese market</td>
<td>SIP incubation center</td>
<td>Novelty (knowledge), dependence between different departments; differences in practices and process</td>
<td>Competitive, proactive; face-to-face meetings; regular conversation and group communication via WeChat</td>
</tr>
<tr>
<td>Case 23: participating in SIP incubator innovation program and developing a studio with AR technology</td>
<td>SIP incubation center</td>
<td>Novelty (technology), dependence between the SME and local partner; differences in practices</td>
<td>Forward thinking, risk taking, proactive; face-to-face meetings, visual meetings; communication via WeChat</td>
</tr>
</tbody>
</table>

Table II. (continued)
On the other hand, several interviewees from the studied incubation centers described the practices of dealing with novelty at a pragmatic boundary. It also speaks to the nature of knowledge itself, that is, knowledge can be a source of innovation. As the following interviewee from a SME registered in Zhongguancun industrial park incubation center described:

This innovation-and-collaboration program started two years ago, and was initiated by the incubation center to facilitate collaborative innovation activities of registered companies there. It provided policy and information support for our company to adopt a new technology collaborating with a university research center. The most significant challenge we were facing was to modify our current knowledge to combine the new ones. In order to achieve this, we had to develop a new process map to collaborate with the university research center. Our company was one of the top five innovators recognized and awarded by the incubation center. (Interviewee 19, Manager)

As a result, we conclude this in:

\[ P1. \text{ Pragmatic boundary with a high degree of novelty provides the condition for knowledge transformation in business incubators.} \]

<table>
<thead>
<tr>
<th>Case</th>
<th>Location</th>
<th>Description of condition of knowledge boundary</th>
<th>Influencing parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 24: developing a communication system for local clients</td>
<td>SIP incubation center</td>
<td>Novelty (knowledge), dependence among the different departments of the company; differences in process and practices</td>
<td>Forward thinking, competitive; face-to-face meetings, visual meetings; communication via online platform, social media, etc.</td>
</tr>
<tr>
<td>Case 25: introducing an energy saving technology to the local corporate client</td>
<td>SIP incubation center</td>
<td>Novelty (technology), dependence between the SME and local corporate clients, differences in knowledge domain</td>
<td>Forward thinking, aggressive, proactive; face-to-face meeting, telephone meeting; group communication on WeChat</td>
</tr>
<tr>
<td>Case 26: manufacturing cellphone fittings with a double size target</td>
<td>SIP incubation center</td>
<td>Novelty (practices), dependence among different departments; differences in practices and process</td>
<td>Aggressive, proactive, risk taking; face-to-face meetings; conversations via internal communication platform and channels</td>
</tr>
<tr>
<td>Case 27: a media campaign to promote company mission collaborating with a local PR firm</td>
<td>SIP incubation center</td>
<td>Novelty (practices), dependence between the SME and local partner; differences in knowledge domain</td>
<td>Forward thinking, aggressive; face-to-face meetings; regular conversations via social media, WeChat</td>
</tr>
<tr>
<td>Case 28: developing a municipal animation park plan collaborating with local government</td>
<td>SIP incubation center</td>
<td>Novelty (idea), dependence between the SME and local collaborator; differences in practices</td>
<td>Forward thinking, proactive; face-to-face meetings, regular conversations, group chat via WeChat</td>
</tr>
<tr>
<td>Case 29: participating in innovation program of the incubator and testing a new materials for product</td>
<td>SIP incubation center</td>
<td>Novelty (knowledge), dependence between the SME and the incubation center, differences in knowledge domain and interests</td>
<td>Forward thinking, proactive, risk taking; face-to-face meetings, regular conversations, social media including WeChat</td>
</tr>
</tbody>
</table>

Table II.
The results confirm that transforming knowledge across pragmatic boundaries requires understanding the conditions of a boundary in order to develop a process which could be re-used in the next cycle, as knowledge is understood as localized, embedded and invested in the tasks, processes and outcomes of a specific practice. To develop and maintain such a complex boundary crossing process, interpretation of differences in knowledge and creation of shared meanings are embedded in local contexts. Shared values create common interests between actors in the incubation centers, generating a positive effect on knowledge transformation across a pragmatic boundary. For instance, one of the following interviewee from a tech company described:

I feel although we are a small high-tech company, there is not much difference of value between us and the management committee of the incubation center, when it comes to innovative projects. It was one of the concerns of our top management team before we registered in this incubation center. Actually we figured out that we share many values, such as efficiency, sustainability on the top of innovativeness. I guess this really helped our company to reduce uncertainty to work with the incubation center for technology development. (Interviewee 4, General Manager)

In the above case, several managerial committee members of the incubation center have nominated by the local municipal government, which partly speaks to the nature of an incubation center which is supported by innovation policies in China. In the current study, both studied incubation centers in Beijing and Suzhou are government initiatives at the national level. As a result, the managerial committee members bring government-oriented cultural elements to the knowledge context and to form a “community of practice” which shares different cultural features, comparing with the SMEs in the business incubator. Those perceived “differences” between different communities of practices in an industrial district (in our case business incubators) may include differences between lay and
professional knowledge communities, government-oriented and entrepreneurial oriented cultures, practical orientation and research orientation, professional commitment (managers vs technical experts), as well as social or cultural preferences, etc. Those all result in conflicting interests and cultures among actors in the incubation centers, competing for access to knowledge resources in an industrial district. It increases the challenges to transfer knowledge across pragmatic boundaries among knowledge actors.

However, the interview results revealed that common interests in innovative practices which were reformed by underlying shared values set up the context for knowledge transformation to accommodate novelty presented at the pragmatic boundaries. These common interests increase the capacity to specify, negotiate, transform and validate knowledge of problem solving among communities of practices. The following interviewee expands this point:

We were encouraged by the management committee of the incubation center to try a high-tech energy saving program. It is new practice to us. We participated in several sessions learning about the sustainability principles and values and see a perfect alignment with the value of our firm. Although it is a government initiated program, the similar value and interests brought us to develop a process so we successfully implemented this new energy saving program and win the annual award. (Interviewee 9, Business Development Manager)

The results also show that trust serves as the mechanism for actors to develop common interests, which facilitate the knowledge transformation among knowledge communities. As the following interviewee put it:

I think it is trust developed during those years that helped our firm to go through the most challenging situations. Our firm invested in the artificial reality technology application to develop a new communication platform, responding to the technology trends in recent years. It is not the technology per se, rather the application process takes longer than had expected. The trust relationship between us and the local technology vendor helped us succeed eventually.

As elaborated in this example, long-term trust developed from pervious collaborative experiences between the SME and the management committee helped actors to negotiate and co-create an application plan for new AR technology application. This trust relationship facilitated the actors to identify common interests in a complicated context and led to knowledge (e.g. technology in this case) to be interpreted and transformed across pragmatic boundaries. Therefore, we propose the following proposition based on our findings:

**P2. Shared value and interests created a context for knowledge transformation across a pragmatic boundary of high novelty.**

*Organizational factors and knowledge transformation across pragmatic boundary*

When interviewees described the innovative activities and practices the companies initiated, several themes emerged including “risk taking,” “creativity,” “entrepreneurial spirit,” “explore opportunity,” “proactive,” “aggressiveness” and “forward-looking.” Those themes described factors impacting knowledge across boundaries at an organizational level, which also speak to the features of SMEs registered in the incubation center.

One of the interviewees described below:

As an internet technology company, we are facing fierce competition in the local market in recent years. Our CEO has a vision that we have to be among the first ones to adopt new internet technologies to develop competitive advantage. I think it is also related to our high entrepreneurial spirit which leads us more willing to take risk. For instance, there have been several rounds of discussions on whether we should collaborate with a local VR (virtual reality) technology center, considering the quick growth of VR in China. While we are excited about the new possibility, it also involves high risk – think about the financial and time investment for the collaboration process, even not to mention the uncertainties related to the future of the technology product. Eventually our company made the decision to step into the VR field and I am quite proud of being part of this process. (Interviewee 17, Business Manager)
For knowledge transformation across pragmatic boundaries in innovative projects, actors are required to commit significant resources when risk is presented. The above example lends further support to the idea that firms that are more willing to take bold actions with higher risks provide helpful conditions for knowledge transformation across pragmatic boundaries. In the above case, the collaborative project of VR technology created pragmatic boundaries for companies to engage in the learning and sharing of knowledge. The project involves transfer of new technology, and increases the novelty of the pragmatic boundary of knowledge transform. Through collaborating with a local VR technology firm, the SME stepped into the VR area. The willingness to take risk shows the entrepreneurial orientation of the firm, which facilitated knowledge transformation across pragmatic boundaries.

In the past two decades, China has been experiencing an environment of rapid changes and shortened product and business model lifecycles. Chinese SMEs have needed to continually seek out new opportunities and take a proactive position to engage in forward-looking business activities. The research results confirm that SMEs with high entrepreneurial orientation are more likely to respond to business environment stimuli by actively forming alliances with other organizations and engaging in information seeking to pursue, identify and create new venture opportunities. This proactive attitude and willingness to take bold actions helps SMEs to transform knowledge across pragmatic boundaries; the entrepreneurial orientation of firms is also demonstrated in organizational vision and culture development as well, which affects how knowledge share and transfer occurs within an organization. The following example elaborates on this:

I think our company is really driven by the vision to be at the leading position of the market. Every employee was invited to share their ideas about the future of the company at our weekly department meetings, and people feel more energetic and inspired. We work together to develop the vision of our firm, which is the crucial step of organizational visioning process. I think it is also a good method to motivate our employees to learn and grow their individual knowledge which contributes to collective learning. (Interviewee 14, HR Manager)

As elaborated above, entrepreneurial orientation and proactive engagement position firms in the knowledge boundary context, where knowledge transformation happens simultaneously at different levels as individual knowledge transforms to collective learning between teams and within organizations. It facilitates knowledge transformation across pragmatic boundaries where knowledge communities create shared values and interests. The above discussions lead to the next proposition:

P3. Firms which are more proactive to engage in creative and forward-looking activities involving risk taking are more likely to engage in knowledge transformation at pragmatic boundaries.

Information-rich media and knowledge transformation: presenting differences and interdependence

A learning process about differences and dependencies of knowledge between actors at a pragmatic boundary was described in numerous cases from the interviews. Differences in knowledge refer to differences in the amount of knowledge accumulated as well as differences in the type of domain-specific knowledge accumulated. As differences between actors increase, the amount of effort required to adequately share and assess knowledge also increases. Dependence between actors describes the condition where knowledge actors need to take each other into consideration in order to meet their own goals while creating a shared context.

Taking the SIP incubation center as an example, the ability to represent and specify differences and dependences allows the registered SMEs and the management committee of the SIP incubator to identify what is most consequential, and then to collectively prioritize their time and resources to resolve those consequences, e.g. creating new knowledge for
business practices or shared agreements about what a specification means. Actors at the pragmatic boundary need to present their current knowledge within their own practices (i.e. cutting edge technology, technical requirements and preferences of registered SMEs; knowledge about supportive services for the management committee of an industrial park incubator), resulting in specifying different needs and preferences among knowledge actors. For instance, one SME interviewee expressed the preference from his unit:

As a startup that just started the practice in SIP incubator, we would really love to get more legal information and services from the one-stop service unit, i.e. intellectual property related legal services or information on tax policy. However, these are very specialized knowledge, and it seems there is not enough resource for SIP incubator to provide these information and knowledge. Those information we can get from them is kind of limited and not up-to-date. (Interviewee 3, Product Manager)

As described above, the gap of current knowledge and the need for shared knowledge could result in barriers between the actors involved, which impede knowledge transfer. However, the knowledge gap could also be a stimulus to trigger the development of new knowledge if the boundary conditions meet the requirements of knowledge transformation across a pragmatic boundary.

In addition to presenting differences, identifying dependencies across these different actors (e.g. registered SMEs, the management committee of the industrial park incubation center or local partners) is also a necessary requirement in transforming knowledge at a pragmatic boundary. The dependency is mostly an existing relationship between the registered SMEs and the industrial park incubator, while SMEs need to establish new relationship with their local partners in some cases. Being located in an industrial park incubation center, the practices of SMEs could be impacted by the policy, support and resources of the incubators to a large extent.

It was found that rich dialog and in-depth conversations happening at both the individual and organizational levels increase the ability of both registered companies and industrial park incubators to present their knowledge differences and dependencies faced at a pragmatic boundary. For instance, the regular face-to-face meetings between SME managers and the management committee of the industrial park incubator allow them to identify knowledge gaps by creating a shared knowledge context. In addition, informal interpersonal conversations between SME managers and the management committee of the incubation centers help both parties to realize how one’s action could impact the other’s action and develop shared interests to achieve goals. Some of those interpersonal conversations and interactions were happening through social media, e.g. WeChat, instant messenger, Weibo, etc. Those media extend interpersonal interactions to visual space, both in the formal (e.g. visual meetings) and informal formats (e.g. casual conversations). Those connections and interactions developed through rich media, with which knowledge actors co-develop a cooperative approach for shared context, and facilitate knowledge transformation across pragmatic boundaries. As a result, we conclude our findings in the following proposition:

P4. Firms that use information-rich media more are likely to engage in knowledge transformation, by presenting difference and dependence at pragmatic boundaries.

Information-rich media and knowledge transformation: reducing uncertainty and equivocality
We also found in the interviews that rich dialogs could help to reduce uncertainty, due to the absence of information for predictability. “Personal connection” or guanxi was mentioned by numerous interviewees, as a main feature of information-rich media. In the case of ZGU incubation center, regular conversations and meetings between SMEs and the management committee of incubation centers not only provided occasions for sharing knowledge, but
also facilitated the building and maintaining of personal connections through interpersonal
dialog and interactions. As a result, knowledge embedded in the interpersonal
communicative context was transformed across pragmatic boundaries. As the following
interviewee expressed:

I sometimes run into product managers from other companies, and we will stop for a quick chat. It
is fascinating to realize how much new information I could get from those conversations, e.g. new
product development trends, industry conference and workshops, etc. As we are all working in
SMEs, there is not much chance to attend professional training and conferences. When new product
knowledge was introduced into work, my existing knowledge doesn’t allow me to grasp it quickly,
as I always need to devote more effort to update my knowledge. (Interviewee 13, Product Manager)

Furthermore, personal interactions and dialogs help to build understanding and trust
among coworkers and other collaborators at the incubation centers, as information-rich
media offer tools and platforms to clarify and interpret policies and regulations, in order to
develop deep connections and relationships. Uncertainty was reduced in the process of
knowledge transformation because trust among coworkers and peers from other companies
enables the sharing of tacit skills which are useful for creating and transforming knowledge.
This point was clearly demonstrated from the following interview:

It has been a few years working in the incubation center, and we know the person working at
the incubation center office very well. We usually get update of policies and regulations from the
incubator management committee. We have been working together for several years and our
company trusts their professionalism, in particular, they provided timely interpretations of latest
industrial regulations. It really helped us in an effective manner. (Interviewee 21, General Manager)

As described in this case, trustworthy relationships between actors facilitate information
sharing and reduce equivocality of policy interpretations; as a result, it facilitates knowledge
transformation across pragmatic boundaries. The process of transforming knowledge across
a pragmatic boundary could be complex, as multiple and conflicting interpretations could
exist which would lead to equivocality and ambiguity. The confusion and lack of
understanding cannot be resolved with one-try, but requires an iterative process to shape
alternatives and solutions overtime. Our results suggest that information-rich media provide a
context to develop an iterative and interactive process which helps to reduce ambiguity and
equivocality at pragmatic boundaries. The following interviewee supports this point:

Working together with the management office of the incubator, we figured out together a
operational plan which is well aligned with the mandate of the IAC program. We set up a group
chat via Wechat including our colleagues and staff from the management office, so we can
exchange message simultaneously. Our production procedure meets both the industrial standard of
raw materials and the specific requirement from the management office. It is helpful that the
management office provides subsidy policy interpretations, as there are several experts in the office
who followed the policy development in those years. Being aware of the latest policy change and
possible future trends helps us to make better decisions and develop our competitive advantages.
(Interviewee 16)

As demonstrated above, knowledge actors (e.g. the registered company and the
management committee of the incubator) participate in the iterations, and they become
better at co-interpreting the industrial standards and requirements of the management
committee, in order not to cause misunderstanding due to equivocality at the knowledge
boundary. Since knowledge is localized and embedded in a given context, such an iterative
capacity is what allows knowledge to be re-localized in new knowledge through each
iteration. As a result, we propose the following proposition:

P5. Firms that use information-rich media more are likely to engage in knowledge
transformation, by reducing uncertainty and equivocality at pragmatic boundaries.
Discussion
This research sheds light on the discussions about knowledge transfer and boundary conditions by examining innovative practices of SMEs registered at business incubation centers in China. There are several major findings in this research. First, this research provides an opportunity to revisit how knowledge and pragmatic boundaries are defined though innovative practices in organizational settings. It lends support to the discussion on knowledge transfer mechanisms, that innovative practices generate pragmatic boundaries where knowledge transfer takes place. The results confirm that the knowledge transfer approaches have to match the boundary conditions, which are shaped by the amount of novelty (Carlile, 2002, 2004; Dick et al., 2017), as well as dependence and differences presented at the knowledge boundaries. Second, this research reveals that shared values and interests among knowledge communities facilitate knowledge transformation, and in particular trust builds deep understanding and common interests among collaborating parties. Third, it explores the crucial role of entrepreneurial orientation in knowledge transformation across pragmatic boundaries, and lends support to the concept of entrepreneurial orientation as a multi-dimension construct which is applicable in the Chinese context as well (Lee et al., 2001; Walter et al., 2006; Wiklund and Shepherd, 2003). The results reveal the dynamic of how innovativeness, risk taking and proactiveness of SMEs impact knowledge transformation across pragmatic boundaries. Fourth, it finds that media richness plays a crucial role in the process of knowledge transform across pragmatic boundaries. Rich dialogs and in-depth conversations allow for immediate feedback and personal connections to build shared understanding and to reduce uncertainty and equivocality at the pragmatic boundary. As a result, information-rich media enable knowledge actors to interact and connect in order to shape alternatives and solutions across pragmatic boundaries overtime.

This research further discusses the mechanisms of knowledge transformation across a pragmatic boundary and extends the previous discussions on boundary conditions to the context of business incubators in China. The results confirm previous discussion on pragmatic boundary featuring high novelty (Carlile, 2002, 2004; Bechky, 2003; Hargadon and Sutton, 1997). Managing knowledge transformation across a pragmatic boundary not only requires creating new knowledge, but also current knowledge used at the boundary to be negotiated and transformed with possible high cost. The results confirm that shared values and common interests between knowledge actors at a pragmatic boundary facilitate knowledge transformation, as actors are able to specify, negotiate, transform and validate knowledge of problem solving at a pragmatic boundary. Furthermore, the results highlight the role of trust as a contextual factor in the Chinese culture, where trustful relationship leads to strong ties (Tortoriello et al., 2012), so there will be less concerns for knowledge being misused (Krackhardt, 1999; Reagans and McEvily, 2003, 2008). This finding captures the relationship aspect of knowledge transformation, and further contributes to the literature on mechanism of knowledge transformation, as trustful relationship facilitates shared values and understanding of interests among knowledge actors so they are able to engage in knowledge transform at pragmatic boundaries (Wang et al., 2012; Qian et al., 2019).

Organizational factors of SMEs and knowledge across pragmatic boundaries
The current research advances the scholarship on impacting factors on the mechanism of knowledge transform across pragmatic boundaries. In particular, the findings reveal the positive influence of entrepreneurial orientation in knowledge transform process in the context of SMEs in emerging markets. It finds that SMEs more proactive to take risks and engage in creative and forward-looking activities are more likely to cross the pragmatic boundaries. This finding is consistent with previous research on the impact of SME entrepreneurship on organizational knowledge performance (Covin and Slevin, 1991; Wiklund and Shepherd, 2003). It examines the knowledge transform practices of SMEs registered at
business incubation centers and reveals the impact of entrepreneurship orientation on the dynamic of knowledge transform of SMEs in the dynamic context of China. It confirms the role of entrepreneurial orientation, as a crucial organizational parameter, in the process of knowledge transformation. In addition, it responds to the call of studies on whether the different dimensions of entrepreneurial orientation would relate to organizational performance in similar ways (Stetz et al., 2000; Kilenthong et al., 2016). While some researchers argue that different dimensions of entrepreneurial orientation impact firm performance in different ways (Stetz et al., 2000; Padda, 2018), this research lends support to the argument that each dimension impacts knowledge across pragmatic boundaries in the same direction. The discussions contribute to the literature on entrepreneurial orientation of SMEs by answering repeated calls to examine how it may influence knowledge practices (McKee et al., 1989; Covin and Slevin, 1991). We call for further research on the dynamics and processes within which entrepreneurship orientation of SMEs could impact knowledge practices in emerging markets.

This research explains the context of rich dialog and multiple interactions and its impact on knowledge transformation across pragmatic boundary and highlights and extends the discussions on information-rich media (Daft and Lengel, 1986; Daft et al., 1987; Schmitz and Fulk, 1991; Kock, 2005) to the context of knowledge sharing and transfer. It furthers illustrates that information-rich media increase the capacity to present the differences and dependencies faced at the pragmatic boundary (Carlile, 1997, 2002, 2004). The results also explain the dynamic knowledge transfer process where information-rich media reduce uncertainty caused by lack of information (Grover and Davenport, 2001; Maznevski and Chudoba, 2000; Klitmøller and Lauring, 2013) and reduce equivocality through multiple interactions and the inclusion of verbal and non-verbal signs to overcome challenges related to capacity in understanding and making sense of equivocal cues (Daft et al., 1987; Herschel et al., 2001; Panahi et al., 2012; Murray and Peyrefitte, 2007). Incorporating the discussions on information-rich media in the context of knowledge transfer furthers our understanding of effective boundary processes and explains the role of information-rich media in managing knowledge transformation across pragmatic boundaries in the context of China.

Conclusion

This research has several practical implications for organizations that face the need to advance understanding of knowledge practices and develop innovative practices. First, to create proper boundary conditions to facilitate knowledge transfer and innovative practices, organizations need to be aware of the importance of boundary conditions in managing knowledge transfer practices. A mismatch between boundary conditions and a knowledge transfer approach is not unusual in organizations for both political and practical reasons. To facilitate knowledge transfer within and between organizational actors, firms need to establish an effective process with tools to accommodate novelty. Second, organizations should be aware of the impact of entrepreneurial orientation on organizational innovative performance and in particular in the context of SMEs in emerging markets. Third, for organizations that face pragmatic boundaries with high novelty, adopting and integrating information-rich media could help decrease uncertainty and equivocality in understanding knowledge practices and managing innovative projects. It also helps to keep collaborating parties engaging in iterative interactions to develop trust and facilitate knowledge transfer at pragmatic boundaries.

This research examines innovative practices of SMEs registered at business incubators emphasizing knowledge and boundary issues within and across organizations. There are a number of limitations in the current study. First, to capture variances in knowledge practices in China, we chose SMEs registered in two different incubators at different cities. The dynamic relationship might vary in different regions and economic environments.
Second, we conducted in-depth interviews to gain insights about SMEs knowledge transfer and practices. Other research methods could be used in future studies to examine the dynamic process and practices of knowledge transfer, e.g. organizational studies with an anthropological approach would help to look into daily practice of organizational actors. Third, we emphasized entrepreneurial orientation of SMEs in the current study, and future research can further examine other organizational characteristics of SMEs and how these characteristics influence the pursuit of entrepreneurship from emerging markets. Further research can address the limitations of this type of research and provide answers to other research questions. For instance, how are boundary conditions of knowledge transfer demonstrated differently in a variety of organizations? What are other factors that impact the dynamic process of knowledge transfer? How does the unique setting of emerging markets matter? We hope future work can build on the current findings and examine these questions in a variety of contexts in the modern era where knowledge practices have become ubiquitous in the organizational settings.

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Further reading


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Unleashing the potential of university entrepreneurship education

A mandate for a broader perspective

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Abstract

Purpose – The purpose of this paper is to highlight the ways in which traditional views of entrepreneurs and entrepreneurship have inadvertently limited entrepreneurship education. The authors propose a broader view of what it means to be an entrepreneur and describe a disruptive approach to entrepreneurship education, one that centers around building students' entrepreneurial mindset. By tapping into students' “inner entrepreneur” and nurturing their abilities to think and act creatively, embrace failure, effect change and be resilient, the authors are preparing them for the challenges of the twenty-first century labor market.

Design/methodology/approach – This is a perspective paper about how the traditional views of entrepreneurship education may be limiting its potential to create entrepreneurial college graduates set to take on twenty-first century careers.

Findings – Teaching the entrepreneurial mindset and process will allow us, as educators, to best prepare our students for the complexities of the current and future workforce.

Originality/value – By embracing the original meanings of the word “entrepreneur” – an act of reaching out and capturing and undertaking – the authors demystify what it means to be an entrepreneur. When we adopt a broader and more accurate conceptualization of “the entrepreneur,” we can teach our students to be the entrepreneurs of their lives.

Keywords Entrepreneurship education, Entrepreneurial mindset

Paper type Viewpoint

Introduction

There is no denying that entrepreneurship education at universities worldwide remains a priority – if not in action, at least in words. Innovative ideas often spring from the individuals working in start-ups, job creation is fostered through new business ventures, and society progresses as problems are identified, solutions are created, and markets and industries are disrupted. The resounding endorsement of bringing entrepreneurship into the classroom with the aspiration of releasing entrepreneurs into society stems from its proven potential.

Yet, the challenge of entrepreneurship education lies in getting it right. For there is scant evidence that entrepreneurship education the way that it is typically taught, it results in a proliferation of new and successful businesses (Schramm, 2014; Yamakawa et al., 2016), which is the typical and narrowly defined outcome of university entrepreneurship programs. There is an expectation that the only measure of success of entrepreneurship education is the graduate who starts and operates a successful company. In the majority, if not all other academic areas, we accept a continuum of success. There are a myriad of ways to practice medicine, law, accounting,
engineering, nursing, design, writing, teaching, etc. But when it comes to entrepreneurship, we expect, and even demand, the creation and sustainability of a new company.

This is unfortunate, as this constricted view of what entrepreneurship education should produce and has spawned unsuccessful entrepreneurship pedagogies and unrealistic outcomes and expectations. And it is built on the very popular and inaccurate characterization of what an entrepreneur should be.

The purpose of this paper is to present, and perhaps more accurately, revive what it really means to be an entrepreneur and how the true meaning of what it takes to be an entrepreneur should influence entrepreneurship education and the expectations of its success. We suggest that the adoption of a broader description of an entrepreneur is re-defining entrepreneurship education in the twenty-first century in a way that is congruent with the current and future labor market considering global, technological, scientific and socio-economic trends.

The mistaken premises of entrepreneurship education
Globally, there are three fundamental assumptions that have dominated university higher education. The first assumption rests on the characterization of the entrepreneur. The immediate and global interpretation of the word “entrepreneur” is one who starts a company. More than that, the word itself conjures images of a superstar who builds a business from scratch; who develops the vision, hires the team, creates the product, gathers the resources, raises the money, propels the company forward and ultimately benefits financially. Thus, the entrepreneur, somehow different from the rest of us, becomes larger than life. Markets and governments view entrepreneurs as engines of progress, through their “creative destruction” abilities, to quote Schumpeter (1934). So, we experience a growing momentum to produce more entrepreneurs in public policy initiatives, in government endorsements, in support of entrepreneurship programs across the globe and in the classrooms of higher education.

In line with this characterization of entrepreneurs, the second assumption in higher education is that an entrepreneurship curriculum must largely revolve around the process of starting and sustaining a new venture. And this leads to the third assumption that an entrepreneurship plan of study or program or curriculum should mirror a business school curriculum.

Higher education has adopted an approach to teaching entrepreneurship that is a version of the business school paradigm. Business schools partition their education into functional areas such as accounting, finance, marketing, management and operations. Students enter business schools and take courses in several functional areas and specialize or major in one area. To provide students with a holistic view of managing an enterprise, students take a capstone class in strategy. Business school curricula assume that graduating students will work in a company as a specialist and may, eventually, move into managerial positions. This general pedagogical approach to business school education is not only valid, but effective as it graduates students well prepared to tackle real world challenges in their disciplines and advance into leadership positions.

With the popularity of entrepreneurship education taking hold in the last 20 years or so, we have witnessed an increase in courses and majors in entrepreneurship in business schools (Katz, 2003; Kuratko and Morris, 2018). The business school approach to entrepreneurship education mirrors the business school pedagogy. Students take courses in entrepreneurial marketing, entrepreneurial law, and entrepreneurial finance and so on. Then, the capstone course in an entrepreneurship major is business planning, intended to integrate the prior courses. The entrepreneurship students graduate and we send them out the classroom door and expect them to be entrepreneurs – to start and run successful companies.

We have learned that it does not work that way (Duval-Couetil and Long, 2014; Yamakawa et al., 2016). And it does not work that way because universities have spawned
entrepreneurship curricula based on the business school paradigm and on a very constricted
definition of what it means to be an entrepreneur. Universities have assumed that teaching
the process of entrepreneurship produces the entrepreneur.

Together, the two assumptions of the definition of an entrepreneur and how universities
should teach entrepreneurship then lead directly to the third logical assumption measure the
success of entrepreneurship education by new venture creation. Yet, empirical studies
supporting that correlation have yielded mixed and weak results.

Higher education needs to re-visit and disrupt all three of these assumptions. There is no
denying the economic and social benefits of new businesses. But to thrive as individuals in
this dynamic global economy and to contribute to economic development, societal welfare
and sustainability, we must replace the depiction of the entrepreneur solely as the successful
venture creator with a broader interpretation of what it means to be an entrepreneur
(Amatucci et al., 2013).

Entrepreneurs are born and made

The word “entrepreneur” originally comes from the combination of two Latin words “entre,”
to swim out, and “prendes,” to grasp, or capture. The French evolution of the word
translates to one who undertakes. If we embrace these original meanings of the word
“entrepreneur” – an act of reaching out and capturing and undertaking – then we open
an interpretation of those moments in our lives when we think and behave as an entrepreneur.
These are “small acts of entrepreneurship” (DeCarolis, 2018).

Small acts of entrepreneurship extend beyond the realm of business or profession – they
occur throughout our lives – although we do not label them as such. When we “swim out”
from what we normally do and grasp or undertake a new opportunity, we are engaging in
small acts of entrepreneurship. It could be relocating to a different city, changing jobs or
careers, or evolving in response to a personal crisis.

We are born “entrepreneurs” and do not realize the extent to which we manifest that
character. For many of us, cultural or societal norms, education or pressures of family may
limit our entrepreneurial qualities. We learn the comfort and safety of doing what is familiar;
we become complacent in routine and perceive fear-based outcomes as opposed to considering
new opportunities. So while society and, in particular, universities emphasize the glorified
version of the entrepreneur – the larger than life individual who starts new ventures – the
inner entrepreneur in all of us gets marginalized and neglected in the classroom.

We have the capacity to think and act creatively, to embrace failure, to effect change, to
persevere, to be resilient. As educators, we can reinforce the idea that beyond the business
context, all of us engage in small acts of entrepreneurship in many aspects of our lives. And
through education, we can foster and nurture and develop the entrepreneur – through a
curriculum curated to the outcome of creating the mindset – not just creating the venture.

An entrepreneurial mindset is an innovative approach to thinking and doing; the
acquisition of an attitude and skill set that encompasses resilience, calculated daring and
initiative. Definitions in the literature vary, but the common attributes associated with an
entrepreneurial mindset include creativity, empathy, resilience, self-sufficiency and the
ability to learn from failure, all of which can be learned (Kuratko and Morris, 2018;
McAlexander et al., 2009). These attributes underpin the making of an entrepreneur.

The notion that individuals have the capacity to change their mindsets, and that doing so
will result in an outcome or series of outcomes is not new. Eastern philosophers, modern-day
athletes and psychologists from many domains have all contributed to the idea that being
present and positive in mind can result in favorable outcomes. Psychologists have been
studying the effects of one’s thoughts or mindset, on mental illness since the 1960s. The
creator of cognitive-behavioral therapy, Aaron Beck (1970), recognized the influence that
negative thoughts had on mental illness and created a branch of therapy that trains people
how to change their thoughts to not only feel better, but to reach their potential. In the 1990s, Martin Seligman et al. at the University of Pennsylvania launched the movement in positive psychology, upon recognizing that having individuals focus on their strengths and positive attributes, rather than on reducing their deficits as traditional psychology did, would result in their abilities to live meaningful and fulfilling lives (Seligman, 1994).

Most recently, educators, parents, and captains of industry have been strongly influenced by Carol Dweck’s (2008) work on the psychology of success. Dweck (2008) challenged the assumption that intelligence, IQ, was a finite property and actually discovered that individuals approach goal setting with one of two mindsets. Those with fixed mindsets believe that intelligence is something one is born with and it is unchangeable, whereas those with growth mindsets believe that intelligence and learning can evolve over time. In educational settings, a child’s mindset would often be reflected in their beliefs about their own capabilities and how much effort to expend toward a goal (Claro et al., 2016). Relatedly, research showed that a teacher’s mindset about a student influenced a student’s ability to learn even the most challenging tasks (Claro et al., 2016; Dweck, 2008). The entrepreneurial mindset, like those studied before it, is tangible and knowable and essential in channeling one’s inner entrepreneur. As educators, if we believe in the power of a growth mindset, such that we can develop our students for continuous learning, and that mindsets are dynamic and can change, then innovative thinking and doing, which is the definition of an entrepreneurial mindset, is synergistic with a growth mindset.

As university educators, we know that we are graduating students into a labor market that values creativity and self-sufficiency, increasingly relies on contract or contingent labor, and is adopting artificial intelligence and automation at a rapid pace. This is an economy in which coming generations of graduates will have multiple jobs in their careers that most likely will include self-employment and/or running a company (or two) while being fully employed. This labor economy demands an entrepreneurial mindset. Whether by choice or by necessity, individuals prepared to face the labor market with an entrepreneurial mindset will transition more smoothly.

The twenty-first century labor market: ripe for entrepreneurs

Current and future labor market trends set the stage for a re-consideration of how universities globally approach entrepreneurship pedagogy and reinforce the need to move entrepreneurship education from its focus on new business creation to a focus on creating the mindset. We are looking at a labor market that demands innovative thinkers and doers as employees, business owners or contingent workers.

Established companies are relying on contract workers to a much larger degree than ever to take advantage of cost savings, flexibility and accessing optimal talent at the right time. Recent research suggests that 40 percent of today’s global workforce consists of non-employee talent such as independent contractors, freelancers, professional services and temporary workers (Dwyer, 2017). This contingent workforce is not meant to supplement talent but to add more value and skills that do not exist within a company. This translates into an opportunity for a new career path – one that does not rely on traditional employment but rather embraces self-employment.

In addition, traditional organizations seek workers with an entrepreneurial mindset (Sherman et al., 2007). In PWC’s annual global survey of CEOs, they are asked about their level of concern about a variety of economic, policy, social, or environmental threats. The availability of key skills is among the top ten most significant concerns for these CEOs. And it is not just technical skills. As important as skills from the STEM fields are, equally important are power skills (Agarwal, 2016) like empathy, creativity and problem solving (Pittz et al., 2017). CEOs believe these are the skills that need to be developed and nurtured for true innovation to take place. When asked how they planned to address the skills gap,
31 percent of North American CEOs said by establishing a direct pipeline from education (PWC, 2019).

The current and emerging workforce needs to be primed to fill this demand. We know that Millennials and Gen Zs want flexibility and freedom. They embrace the gig economy as it provides a lifestyle they value. They want to start their own company at some point in their career. They want to work for companies that have a positive impact on society. These workers overwhelmingly believe that corporate objectives should include positive impacts on society and the natural environment (Deloitte, 2018).

Millennials and Gen Z employees embrace the notion of the boundaryless career –one characterized by non-traditional mobility patterns and job changes (Briscoe et al., 2006) – as it supports the flexibility and freedom they crave. The Bureau of Labor Statistics documents that in the first twenty years of a career in the USA, people will have about ten jobs and some of them will be self-employment (Bureau of Labor Statistics, 2017). In general, a majority of this generation's workforce see themselves leaving their current employers within two years (Deloitte, 2018). Given the demands/characteristics of the labor market and the profile of the labor workforce (Carriker, 2017), higher education has an opportunity and responsibility to educate people to be the entrepreneurs of their lives.

In fact, student demand is what has driven universities (typically within business schools) to create courses and even majors in social entrepreneurship. There are two broad models educators use to teach social entrepreneurship: one is fundamentally about social change and building community capabilities; these ventures are highly mission driven and that takes precedence over building competitive advantage. The other is that business development and profitability must be prioritized as public and private funding sources are rapidly disappearing and social entrepreneurs have no choice but to accept commercial logic (Tracey and Phillips, 2007). Regardless of the perspective taken, educators must prepare social entrepreneurs for the demanding, complex and often ambiguous world they will encounter either in existing ventures or newly created ones (Tracey and Phillips, 2007; Worsham, 2012).

Largely considered the Father of Social Entrepreneurship, Greg Dees advocated for always teaching social entrepreneurship within the larger context of social change and that achieving true social impact should be the sought outcome (Worsham, 2012). He referred to the art of creating social change in meaningful ways that do not alienate the populations being served by the social venture. He believed that skills including humility, respect and empathy (components of the entrepreneurial mindset) were of paramount importance for social entrepreneurs and that business schools were typically not the best places for students to hone these skills (Worsham, 2012).

Other research supports the notion that entrepreneurial competencies include non-traditional capabilities like passion and compassion, persistence and tenacity, optimism and creative problem solving (Kuratko and Morris, 2018; Robles, 2012; Pittz et al., 2017). Research supports the inclusion of emotional intelligence (Worsham, 2012), mindfulness (Kelly and Dorian, 2017) and ethical decision making (Fisscher et al., 2005) in programs of social and traditional entrepreneurship, as these are the tools that will help students gain success in any context in which they work: whether through a corporate employer, at a consulting firm, working with a social entrepreneur, serving on a board, volunteering and the like (Worsham, 2012, p. 450). Taken together, these studies suggest that characteristics associated with the entrepreneurial mindset help enable success in multiple contexts.

The twenty-first century university entrepreneurship curriculum
As mentioned earlier, three assumptions underlie the traditional entrepreneurship curriculum. The first is the narrow description of an entrepreneur; the second is that entrepreneurship curriculum should mimic a business school curriculum and the third is
measuring the outcome of such an education as new business creation. Eradicating these assumptions paves the way for much needed changes in entrepreneurship pedagogy.

To prepare students for today’s world of work, the twenty-first century university entrepreneurship curricula must focus on developing the whole person, one who learns to think and act like an entrepreneur. Once we expand the definition of the entrepreneur to capture its original meaning – one who takes a chance and reaches out – we can use that definition as a foundation for creating curriculum and programming that teaches an entrepreneurial mindset and will allow students to remain competitive throughout the course of their careers.

It is a curriculum that captures aspects of business and the process of entrepreneurship along with the entrepreneurial mindset. To attain this intersection of skills, the pedagogy must be experiential.

This is accomplished through immersion in starting a business, perhaps several times throughout their university experience. Students must experience, first hand, the frustrations of failure, and finding a way back in, while doing so in a safe environment. They must be allowed to experiment, to adapt and to pivot when necessary. Infusing a practice-based pedagogy – where students can develop self-efficacy around responding to uncertainty and evaluating risks – is paramount to developing an entrepreneurial mindset (Yamakawa et al., 2016). This involves an apprenticeship approach and committed instructors and mentors and peers who intertwine the classroom concepts simultaneously with experience.

As professors and mentors, while we guide them through the startup process, our focus should be not just on the business and operating decisions, but also on a cluster of personal attributes that do indeed contribute to an entrepreneurial outlook. Integrating course work and experiences that address personal entrepreneurial development is a necessary component of learning entrepreneurship.

Research supports the idea that teaching an entrepreneurial mindset has benefits. The results of a cross-case analysis of 22 varied entrepreneurship programs across Europe suggests that fostering an entrepreneurial mindset contributes to the development of the whole person (Secundo et al., 2016) and contributes to life-long learning. The entrepreneurial mindset has been shown to facilitate student engagement and believed to be a core competency in engineering education (Korte et al., 2018). In fact, engineers believe that “soft skills” are so important, they are embedded into the mission of the Kern Entrepreneurship Education Network, which is to create an action-oriented, entrepreneurial mindset among undergraduate STEM students (Rae and Melton, 2017). The entrepreneurial mindset has been studied outside of the university setting. In Togo West Africa, micro-entrepreneurs were divided into two groups: one group attended training that focused on proactive entrepreneurial behaviors and the other group attended traditional business training. The micro-entrepreneurs that went through proactive mindset training increased firm profits by 30 percent over the 11 percent increase by those exposed to traditional business training (Campos et al., 2017). These studies highlight the applicability of teaching the entrepreneurial mindset across settings and with different, positive outcomes.

Implications for entrepreneurship education and research
Seismic shifts in how individuals will earn a living, how the coming generations view their careers and how they embrace their obligations negate the traditional assumptions in higher education of what it means to be an entrepreneur and how their success is measured. The outcome is to create a more entrepreneurial society, not just new businesses (Carriker, 2017) and this begins with the awareness that every individual has the capacity and can acquire an entrepreneurial mindset.

Universities have a mission to educate individuals that are productive and responsible global citizens. Entrepreneurship education can be a major force in fulfilling that commitment.
And we can only fulfill that global imperative if we disrupt the traditional approach to university entrepreneurship education.

Our small acts of entrepreneurship enhance resilience, self-esteem and innovative thinking. What if higher education in entrepreneurship embraced and nurtured the inner entrepreneur in all of us? What if a major component of entrepreneurship education was the acquisition of resilience, initiative, confidence, ethical decision making, which students could take with them in new ventures, or established companies or in their life decisions? What if entrepreneurship education included personal empowerment and accountability for the world’s challenges as students approach and manage their career choices?

Imagine how higher education could contribute to eliciting the inner entrepreneur in all of us through embracing the broader and more accurate conceptualization of “the entrepreneur” and infusing the experience throughout our programming.

So, what is the appropriate outcome of an entrepreneurship education that simultaneously produces the person and educate the process? If we do not measure the success of an entrepreneurship education by the number of new ventures our graduates start, how will we define success? Teaching the entrepreneurial mindset throughout the course of the program is tangible and measurable. Students can be assessed in their first year using the validated version of the Entrepreneurial Mindset Profile (Davis et al., 2016) and then again when they graduate. In addition to collecting pre-post EMP data, students should be provided the opportunity to respond to open ended questions in an exit survey or interview to best articulate what they learned. These metrics will provide a better understanding of the extent to which the twenty-first century entrepreneurship curriculum is in fact providing students with the tools necessary to be the entrepreneurs of their lives.

Embracing a broader perspective of what it means to be an entrepreneur and adapting entrepreneurship curricula to that perspective sets the stage for new research questions. Studies that measure the success of entrepreneurship education will need to adapt dependent variable outcomes to include much more than whether graduates start companies. If, in fact, we aim to teach students to be entrepreneurs of their lives, then we must engage in longitudinal research that can assess the career trajectories of our graduates and their definitions of success along the way. This sets the stage for a stream of research that examines the subjective career experiences and successes (Arthur et al., 2005) of graduates of entrepreneurship programs.

Another interesting stream of research might focus on the varying career paths that entrepreneurship graduates choose, and the specific aspects of the entrepreneurial mindset that inform those choices. For example, we might investigate the application of the entrepreneurial mindset to decisions to pursue innovations in start-ups vs in established companies, in non-profits and governmental organizations. Can we correlate the growth in their entrepreneurial mindsets to choices to innovate in the public or government the sectors?

Since Millennials and Gen Zers are attuned to solving societal and environmental challenges, research could capture whether and how these graduates are employing the entrepreneurial mindset to make positive societal impacts. Ultimately, crafting curricula around the broader definition of what it means to be an entrepreneur, coupled with the varying measures of successful outcomes will allow higher education to unleash the power of a new paradigm in entrepreneurship education.

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