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What business schools do to support academic entrepreneurship: a systematic literature review and future research agenda

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ABSTRACT
The literature on academic entrepreneurship within business schools is limited and fragmented. The purpose of this systematic literature review is to address this deficit and to identify what business schools do to support academic entrepreneurship and to outline a future research agenda. Based on our systematic literature review we identified three main themes that business schools do to support academic entrepreneurship namely: *entrepreneurial education; entrepreneurial networks; and entrepreneurial ecosystems*. Furthermore, we identified two further embryonic themes, *individual level factors* and *obstacles to entrepreneurship*. Based on our review and analysis we present some future avenues for research.

KEYWORDS
Academic entrepreneurship; business schools; commercialisation activities; technology transfer; knowledge transfer

Introduction

Academic Entrepreneurship (AE) has received increasing attention in the fields of higher education, entrepreneurship, and innovation (see Anderseck 2004; De Silva 2016; Hayter and Cahoy 2018; Shane 2004; Schmitz et al. 2017; Wright et al. 2008). Contemporary studies depict AE as a relatively new phenomenon, a facet of university technology transfer and university-based startups (Wadhwani et al. 2017). AE refers to the activities undertaken within universities to stimulate entrepreneurship; such activities in universities include patenting, licensing, start-up creation, and university–industry partnerships (Phan and Siegel 2006). The central role AE plays in the broader mission of a university is also appreciated as Hayter et al. (2018, 1039) posits: 'AE – the establishment of new spinoff companies by faculty, postdocs, students, or affiliated personnel based on university technology – is a critical vehicle for economic and social development'. Within the higher education literature Mars and Rios-Aguilar (2010, 453) found that: 'Our analysis of the patterns in how AE has been conceptualised and operationalised in higher education research first revealed the near indiscriminate application of entrepreneurial frameworks to market-oriented phenomena'. The entrepreneurial engagement of academics is further categorised by De Silva (2016) as teaching-related and research-related academic entrepreneurial activities as well as company formation.

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Business schools (BSs), alongside other schools/faculties, contribute to shaping and supporting universities' missions through AE. Debates on the role, purpose, and relevance of business schools including their contribution to society and the economy persists (see Cornuel 2007; Grey 2002; Sadler-Smith and Cojuharenco 2020; Hogan, Kortt, and Charles 2020); Yet, the role of BSs in AE is more nuanced. There is vocal criticism aimed at the activities of BS academics in both the popular (Jack 2020) and academic (Fleming 2020) press. The accusation levelled at BS academics argues that they are excessively focused on abstruse topics with little relevance to the real world, and of limited benefit to society (Jack 2020). Recently there has been an acknowledgement that business schools are espousing the values of governance and management, yet they remain alienated from 'collegial self-governance' due to the top-down management hierarchies present in universities (Fleming 2020, 2). There has been a shift to refocus the values, process, and identities at the heart of BS education; natural follow-on to this shift is the redeployment of BSs intellectual and philosophical skills in a pragmatic, real-world context. This operationalisation has manifested in the support and nurturing of business venturing occurring on campus and in Universities' local vicinities. AE is low hanging fruit that enables BS academic to contribute to business venturing processes in an accessible way that is also bounded within the academic context. Business schools' AE consists of two divergent activities: *generic* and *targeted* support (Wright et al. 2009). *Generic support includes* courses on entrepreneurship, marketing and financial planning and general commercial and management guidance. As hosts to complementary disciplines (law, economics, finance) business schools provide a range of resource sets in one environment. Furthermore, business schools' tendency to engage trainers from industry, provides potential academic entrepreneurs' access to rich, co-located knowledge sources that supports wider institutional AE (Wright et al. 2009). From a *targeted support* perspective, BS faculty may support university start-ups by joining their boards as non-executive directors or acting as consultants during the business planning process. Business school faculty can support AE indirectly by serving on boards of universities' technology transfer operations and contributing knowledge and skills that the board may otherwise lack (Wright et al. 2009).

Where AE is concerned, BSs are uniquely positioned. Firstly, their activities (programmes and research) are aligned with the mission of AE promotion, secondly early-stage AE venture creation tends to take place on campus, so its geographically proximal. Furthermore, it enables BS academics to develop cross-disciplinary research networks, in addition to increasing their real-world legitimacy, as it demonstrates an ability to move beyond the ivory tower and foster industry linkages (Wright et al. 2009). Essentially, BSs play a role in supporting AE that is aligned to the university mission. Against this background, given the changing mission role of universities Siegel and Wright (2015) argue that there is need to reconsider AE. Guided by Wright et al. (2009) nuanced understanding of AE within BSs, this paper presents a systematic literature review to identify BSs activities that support AE and subsequently outline a future research agenda. To this end our paper is organised as follows. We detail the framing and scoping of your study followed by a presentation of our key findings. The paper culminates with suggested future avenues of research.

Framing and scoping our study

Against the background outlined and taking inspiration from prior systematic searches (see de Bruijn-Smolders et al. 2016; Macfarlane, Zhang, and Pun 2014; Puig et al. 2019), the process began by setting the research objectives and defining the conceptual boundaries. The search took place over an 18-month period (June 2019 to November 2020) and was conducted in a two-stage format – one general and all-encompassing, the other more specific and targeted. The first search was conducted in June 2019. The literature on AE with a specific focus on BSs was limited, therefore, a general search of the theme 'AE', in ESCBO Business Source Premier, was carried out. The search was limited to 1998 to 2019 to ensure that it was as contemporary as possible at that time (see Table 1).

Table 1. Systematic search stage one.

Setting the research objectives

- Explore the current state of research on the relationship between business schools and academic entrepreneurship
- Examine the thematic developments emerging from the research
- Map the current state of empirical research
- Identify the implications for future research

Defining the conceptual boundaries

- Focus on the role of the business school in supporting technology transfer
- Examine the changing role of the business school where academic entrepreneurship is concerned
- Consider the various stakeholders involved with whom the business school needs to engage with to facilitate academic entrepreneurship

Inclusion criteria

- Timeframe: Initial search focused on 1998–2019. Second search removed this constraint and examined all results to present day (Nov. 2020)
- Search terms: 'academic entrepreneurship'; 'business school'; 'knowledge transfer'; 'technology transfer'; 'entrepreneurial academics'
- English language articles appearing in top journals**

EBSCO Business Source Premier
Inclusion criteria

- Timeframe: January 1998 to June 2019 (extended timeframe beyond initial 20 years due to new publications)
- Search terms: ('entrepreneurial academic' OR 'academic entrepreneurship') AND 'business school' appearing in title (TI), OR abstract (AB), OR keywords (KW)

Search Boundaries

- Search in TI, AB, KW
- Boolean operators OR between terms
- Filters: 'Academic Journals', 'Peer-Reviewed', English Language'
- Published between 01/1998 and 06/2019
- Excluded working papers, conference proceedings, retracted papers, non-peer reviewed books

Results

- Returned 112 papers

Once the first search was complete, a fuller understanding of the literature was gleaned and a more defined search criteria was developed. The second set of searches were conducted in November 2020. The search was not time limited and it focused on Scopus and Web of Science databases (see Table 2).

The two-stage search format returned 176 results (see Tables 1 and 2). These results were filtered to ensure only highly relevant articles were considered for the systematic literature review (see Table 3.).

Following all detailed search procedures (constraints, boundaries, filtering criteria) a final set of 49 papers were analysed as part of this review (see Table 4).

Key themes

Our systematic literature search yielded a final set of forty-nine papers, broadly covering three main topics related to AE and the role of BSs – *Entrepreneurship Education* (20 papers), *Entrepreneurial Network* (13 Papers) and *Entrepreneurial Ecosystem* (10 papers); there are two further embryonic themes that emerged – *Individual Level Factors* (4 papers) and *Obstacles to Entrepreneurship* (2 papers), which are detailed in the overview tables, the limited detail present on the embryonic themes highlight the limited literature present (see supplementary appendix)

Table 2. Systematic search stage two.

Scopus	Step 1: ALL ('knowledge transfer' OR 'technology transfer' OR 'entrepreneurial academics')	171,055
	Step 2: Step 1 AND TITLE-ABS-KEY('academic entrepreneurship') AND ALL('business school')	124
	Step 3: All prior steps AND Language: English AND Source Types: Journal AND Document Type: Article	97
	Step 4: All prior steps AND limited to specific top tier journals**	**59**
Web of Science	Step 1: ALL = ('knowledge transfer' OR 'technology transfer' OR 'entrepreneurial academics')	35,614
	Step 2: Step 1 AND ALL = ('academic entrepreneurship' AND 'business school')	5
	Step 3: Step 1 & Step 2 AND Language: English AND Document Types: Articles	5
	Step 4: All prior steps AND limited to specific top tier journals**	**5**

Table 3. Filtering criteria.

Filtering criteria

- Step 1: Remove any duplicate results from the searches
- Step 2: Read all the titles and abstracts to verify whether results align to the content scope of the review
- Step 3: Read all remaining articles in their entirety to verify alignment with content scope

**Search Two was limited to the following journals:

The Journal of Technology Transfer	Higher Education Quarterly
Research Policy	International Small Business Journal
Technological Forecasting and Social Change	Journal of Business Research
Small Business Economics	Journal of Business Venturing
Int'l Journal of Entrepreneurial Behaviour & Research	R&D Management
Journal of Management Studies	Strategic Entrepreneurship Journal
Academy of Management Perspectives	Strategic Management Journal
British Journal of Management	Technovation
Entrepreneurship and Regional Development	Studies in Higher Education
European Planning Studies	Academy of Management Learning & Education

Entrepreneurship education

The analysis found that existing literature focuses predominately on the themes of skills and training, and structural changes. With respect to *skills and training*, Arranz et al. (2017), highlight the importance of complementing traditional curricula with group activities that enables business ideas to develop. In the short term, entrepreneurial training increases self-efficacy, which boosts passion; in the longer-term passion stimulates business creation (Gielnik et al. 2017). BSs are uniquely placed to dispense such training to a wide cohort of students across a diverse range of faculties (see Gilmore et al. 2020).

Government policy strives to promote entrepreneurship for its economic benefit through entrepreneurship education (O'Connor 2013). However, entrepreneurship is complex and doesn't correspond nicely with the established academic discipline (O'Connor 2013), a fact that holds true where teaching entrepreneurship and academics engaging in entrepreneurship, are concerned. Yet, despite its complexity, entrepreneurship education has been found to have a positive effect on attitudes, perceived behavioural control, and the intention to become an entrepreneur (Rauch and Hulsink 2015). Such individual transformation is a theme reaffirmed by Morris et al. (2011)

Table 4. SLR emergent themes and number of papers.

SLR emergent themes	No. of papers
Entrepreneurship Education	20
Entrepreneurial Network	13
Entrepreneurial Ecosystem	10
Individual Level Factors	4
Obstacles to Entrepreneurship	2
Total Papers Reviewed	49

study, in which students and staff were involved in a range of entrepreneurial initiatives over 5 years. According to Snihur, Lamine, and Wright (2018) business model-based teaching enables a form of learning-by-doing and reflection (Pittaway and Thorpe 2012), that transforms the educator from a lecturer into a coach and leads to a virtuous learning-cycle, enabling practical experience-based learning. The general public also play a role in entrepreneurship education policy and practice (Hannon 2018) while, entrepreneurship educators are firmly planted between the intersection of education and entrepreneurship, in a sense they are 'bilingual' (Johannisson 2015; as cited in Hannon 2018). BSs and entrepreneurship education play an indirect role in business venturing as a population's education level impacts an entrepreneur's performance (Millan et al. 2014). BSs can collaborate with other disciplines and departments to develop multidisciplinary, complementary programmes across campus such as creating a technology management course between a BS and an engineering school (Kim 2015). Embedding entrepreneurship education in a real-life context ensures alignment between the real-life actions of an entrepreneur and the detail contained within entrepreneurship textbooks, sometimes there is a disconnection between both (Edelman, Manolova, and Brush 2008).

Traditional ideations of AE are the central focus of *structural changes*, capturing enhanced efforts to promote commercialisation on campus (Siegel and Wright 2015). This has given rise to a tension between the utilitarian role of universities and the provision of education-for-education's sake (Wright 2014). Wright (2014, 331) suggests a need to develop a differentiated approach embracing both traditional academia as well as more applied work 'that enables communication to a wider audience'. The shift towards an entrepreneurial university requires new ranking and reward structures (Gür, Oylumlu, and Kunday 2017); a non-linear, systems-thinking approach to support an entrepreneurial university ecosystem. Marzocchi, Kitagawa, and Sánchez-Barrioluengo (2019) echoes this sentiment for new structures to ameliorate tensions between traditional research and teaching and new forms of entrepreneurial endeavours. Gianiodis and Meek (2020) argue that the two metrics for assessing entrepreneurial universities' performance – new firms formed, and licensing revenue generated – are not readily applicable to science and technology entrepreneurship education. Thus, broader assessment metrics are required to ensure that the effectiveness of entrepreneurial education efforts are adequately understood and reflect the centrality of AE within BSs.

Entrepreneurial networks

BSs impact the wider community through leadership, research, and student involvement. Universities are strategic vectors in their community connecting public and private stakeholders (Wakkee et al. 2019). BS students/faculty possess complementary skills to those of science and engineering students/faculty. Creating close ties and enabling graduate student involvement in university spin-offs can benefit both parties (Hayter, Lubynsky, and Maroulis 2017). Similarly, Lockett et al. (2009) appreciates that a single individual does not have the full spectrum of skills necessary to develop all aspects of business and as such they need support. Therefore, such activities may involve BS students/faculty collaborating with other school faculty/student members.

University departments considering commercialising an invention/innovation often involve the TTO as a means of translating scientific discoveries; however, the role of TTOs is often misinterpreted by faculty, leading to frustration (Huang-Saad, Fay, and Sheridan 2017). Taking a traditional definition of AE, the role of the BS is that of an intermediary or boundary spanner, coordinating the relationship between the TTO and the relevant faculty involved in the commercialisation (engineering or science). This concept was touched on by Wright et al. (2009) and according to Pugh et al. (2018) a dual model of engagement, that enables the entrepreneurship department to operate within the framework of the entrepreneurial university but also as a regional actor in its own right is required. Such an approach recognises entrepreneurship beyond the traditional sphere of research and teaching to include its relevance to the local, regional, and national economy, beyond university walls. For example, Bolzani, Rasmussen, and Fini (2020) found that equity-based linkages and

geographical proximity positively impact university spin-off firm performance. However, increasing technological ties between university spin-off firms and their parent university has a detrimental effect on performance, thus illustrating the need for caution as some ties between spin-off firms and their parent university are more fruitful than others (Bolzani, Rasmussen, and Fini 2020). The concept of intermediary organisations, bridging the different logics of academia and industry, was explored by Villani, Rasmussen, and Grimaldi (2017); their theoretical framework devised the roles intermediaries can play in reducing distance in university-industry collaborations, providing insights from BSs and TTOs. According to Tartari, Perkmann, and Salter (2014), the behaviour of academics is influenced by their local social context, suggesting that BSs' culture influences whether faculty members participate in AE activities beyond entrepreneurship programme delivery.

Apart from building networks and relationships (both within and outside academia), there are elemental factors that have an impact on AE. For example, 'the emergence of entrepreneurial ideas in natural sciences is positively affected by proximity to business schools' (Goethner and Wyrwich 2019, 1016). Knowledge flows can emerge due to sheer proximity and these flows can be an important source of business ideas. Furthermore, within departments, support from management and senior academics for gaining commercial experience and giving time to explore commercial opportunities is a small action peers can engage in that can have a substantial impact on subsequent spin-off development paths (Rasmussen, Mosey, and Wright 2014). The momentum gained from such support influences the development of entrepreneurial competencies and has a knock-on effect on the academic entrepreneurs' relationships with external actors. The nuances of a university are also relevant, a university is not a uniform entity, it is comprised of different levels and competencies – there are individual academics, central management, students, TTO offices (Rasmussen and Wright 2015). The role played by each, in supporting AE is dependent on the type of competency that the spin-off requires – and the spin-offs requirements depend on the type of venture it is. One area where universities can play a significant role in influencing AE is through the resource logic of those developing their firms with close interaction with the university (Politis, Winborg, and Dahlstrand 2012). Championing lean alternatives to capital intensive strategies opens the door for a much larger cohort than those with substantial financial access, this approach reduces undesirable lock-in effects in the start-up phase and ensures that any closure would have a limited impact on future entrepreneurial career choices (Politis, Winborg, and Dahlstrand 2012).

Entrepreneurial ecosystem

Beyond teaching and research, universities are attempting to institutionalise innovation using novel organisational structures. Etzkowitz et al.'s (2019) discussion on university-region co-development strategy, views the university as a stakeholder; the BS is uniquely placed to understand the academic incentives and the market-based systems necessary to facilitate the configuration of a mutually beneficial entrepreneurial ecosystem. While there is a recognition in the literature that universities are a public good, overly emphasising entrepreneurship as the commercialisation of scholarly activities can detract from universities primary objective (Uslu et al. 2019). However, it is important that universities adopt an ecosystem approach rather than excessively focusing on individual elements and leverages policy decisions to further strengthen their potential for economic impact (Hayter et al. 2018). The dual purpose of being a public good and an engine of economic growth are not mutually exclusive, once the needs and interests of stakeholders are translated into a shared meaning, entrepreneurial activities and value creation can be occur simultaneously (Simeone, Secundo, and Schiuma 2017). Smith and Bagchi-Sen (2012) found, in their case study examination of the University of Oxford, that the university has created an innovation structure comprising of traditional entrepreneurship programmes in addition to collaboration and outreach activities with industry. Moreover, Ankrah et al. (2013, 63) posits that the role of the TTO is necessary to reconcile the 'needs of the two parties', spanning the boundaries between industry and academic actors operating in different domains. At a high level, there are clear similarities between the self-declared motives and outcomes

of academics and industry actors; it is only at a detailed level that differences present. Belitski, Aginskaja, and Marozau (2019, 40) found, somewhat counter intuitively, that 'there is no relationship between the establishment of TTOs … and the extent of research commercialisation'. In fact, direct industrial funding is effective for knowledge transfer from universities and the ecosystem is more important than the organisation for research commercialisation from academic scientists.

Again, the question emerges, – is there a role for the BS to act as an intermediary between commercialising faculty, the TTO, and industry? According to Levie (2014), non-BS faculties have mixed feelings about business and most non-entrepreneurship academics think it cannot be taught – thus perhaps the BS needs to position itself as a point of reference/contact within other faculties even before there is an innovation requiring commercialisation. Interdisciplinary modules and mentorship may perpetuate a level of trust and knowledge about different faculties cultural practices. The fact remains that corporate spin-offs perform better than university spin-offs in terms of survival and growth (Wennberg, Wiklund, and Wright 2011), so obstacles must persist hindering individual academics where their corporate counterparts succeed. Villani, Linder, and Grimaldi (2018, 180) highlights the 'minimal market view of academic founders, who are mainly focused on investment in research' as a key challenge.

Discussion and future research agenda

The systematic literature review highlights that there is paucity of research focused on AE and BSs and although this review identified a selection of unifying, high-level theme, the existing literature remains highly fragmented.

Generic supports: entrepreneurial education

This review highlights that BSs support of AE is predominately through the teaching mission, aligned to Wright et al. (2009) generic supports. However, the definition of AE within a BS is more nuanced and contextualised than commonly used definitions of entrepreneurship (see Grimaldi et al. 2011). This finding is not surprising given the expertise and competencies that exist in BSs. Wright et al. (2009, 574) identified factors that challenge business schools' ability to engage more in AE – the degree of BS integration/isolation, 'the potential conflicts between the objectives of promoting AE and resource allocation and incentive systems within the university'. Thus, while the promotion of AE and knowledge transfer are acknowledged as important within a university, the contextualised emphasis tends to centre on business schools' performance in international rankings (see Bradshaw 2007; Noorda 2011). A narrow focus on rankings favours academic journal outputs, as opposed to actively pursuing the spin-out process- a traditional pathway for AE which is inherently more complex, and requires more resources (see Parmar 2005; Nikiforou et al. 2018). This finding raises an interesting strategic and empirical question as to whether BSs simply need to provide highly quality, generic supports, while playing an intermediary organisational role, and is this combination sufficient to contribute to the overall university mission? Industry recipes (Spender 1989), entrepreneurial architecture (Nelles and Vorley 2010), dynamic capabilities in higher education (Hayter and Cahoy 2018; Leih and Teece 2016) are relevant perspectives to begin to address this relevant and challenging issue.

Entrepreneurship education research on BSs illuminated how they contribute to AE through skills, training and advice provision. These invisible supports are necessary to fulfil more traditional definitions of AE (Hayter et al. 2018). Future studies need to examine the underpinning business models within BSs that support skills and training necessary for entrepreneurial activities irrespective of context. More specifically research needs to examine the skills and training that BS faculty need to deploy to support an academic entrepreneur or an entrepreneurial academic (Miller et al. 2018).

Contribution and impact

Future research may evaluate and understand the direct and indirect contributions and impact that BSs make in supporting AE within and outside their institutional settings. Future studies should focus on BSs that have demonstrated consistent tangible supports and validated AE outcomes/successes with generic and targeted supports (Wright et al. 2009). Taking a micro-level approach (see Cunningham and Menter 2020) and using different theoretical lenses such as institutional and process theories (Oliver 1991; Burgelman et al. 2018), further advance our understanding on the impact of BSs on AE. Moreover, there is merit in pursuing studies where BSs either do not, or failed, to effectively support AE or regenerative AE. Recent studies of entrepreneurship failure might be a worthwhile focal point to purse such studies (see Ucbasaran et al. 2013; Walsh and Cunningham 2016; Walsh 2017).

Entrepreneurial networks

Future research should explore how BSs' entrepreneurial networks support AE given the paucity of research identified in this review. The nature of BS activities means they have an array of industry linkages. Examining how BS-industry linkages are harnessed to support AE and what factors and motivations drive and sustain BS-industry linkages that support AE would be illuminating. Taking an entrepreneurial ecosystem and or stakeholder perspective would be a fruitful avenue to explore (Cantner et al. 2020; McAdam, Miller, and McAdam 2016).

Embryonic themes

The embryonic themes unearthed are individual level factors and obstacles to entrepreneurship and need to be explored. Focusing on contextualisation within the entrepreneurship field provides a useful reference point to build future studies (Welter 2011). Furthermore, there is a need for micro-level studies at the individual level to explore how BSs and their faculty support individual scientists in other faculties pursue AE (Cunningham, Menter, and O'Kane 2018; Del Giudice et al. 2017; O'Kane et al. 2020).

Conclusion

Through our systematic literature review our contribution lies in the identification of three main themes capturing how BSs support AE. The suggested avenues of future research (and the identification of embryonic themes) are important considerations for the higher education community given the size, scale and potential influence of BSs; both in shaping wider institutional agendas and business practices, as well as reflecting the contextual situation of BSs (see Bennett and Kane 2011). Actively supporting AE may be one means for BSs to tangibly demonstrate how they are closing the divide between teaching, research and the third mission (see Dostaler and Tomberlin 2013), while also addressing on-going debates on their mission relevance (Pfeffer and Fong 2002; Grey 2001; Starkey and Tempest 2009). At a more fundamental level, our study raises a wider question concerning the contribution of BSs to society and whether AE should be the dominant activity to demonstrate relevance and impact. Further avenues of research as outlined above, will not alone advance our understanding of how BSs support AE, but also will address this wider fundamental question of BSs' societal relevance and contribution.

Disclosure statement

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*Denotes 49 papers forming the systematic review.

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