

## **Research opportunities considering student entrepreneurship in university eco-systems.**

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### **Abstract**

We consider the under-explored phenomenon of student entrepreneurship and suggest avenues for future research across different levels of analysis. Taking a university entrepreneurial eco-system approach, we unpick the various elements that may contribute towards local economic development and discuss how they may interrelate. We draw upon theoretical constructs from organisational behaviour, education and psychology and show that studying student entrepreneurship offers great potential to contribute to the fields of entrepreneurship and management.

Keywords: ecosystems, visual mapping, sense-making, grand challenges.

## **Introduction**

Universities globally are increasing their support for student entrepreneurship through curricular and extra-curricular programmes. Within the curriculum there is a shift towards experiential education as students work on contemporary industrial and societal challenges in the classroom. This is complemented by extra-curricular activities where students and alumni are encouraged to address such challenges through venture creation. University support for student entrepreneurship is diverse and far reaching and includes hackathons, germinators, incubators, seed and angel funding, entrepreneurs in residence and growth programmes.

Research considering the impact of such interventions offers great promise. For the first time, researchers have relatively straightforward access to the antecedents of venture creation in real time. There is potential to consider the earliest stages of venture creation across a vast natural experiment where the factors associated with venture performance can be captured and controlled for. Such an empirical bonanza encourages novel theoretical approaches. We highlight the possibilities for deploying theories from disparate disciplines across and between different levels of analysis.

For instance we advocate taking an entrepreneurial ecosystem approach to help explain the creation, development and growth of new systems of entrepreneurship within University regions. We also revitalise the, more traditional, individual level of analysis by utilising diverse theoretical and methodological approaches, such as a sense making and visual mapping, and show how this could yield new insights into the antecedents of student entrepreneurship.

We conclude that student entrepreneurship as a domain can yield exciting new contributions to the study of entrepreneurship and management through the use of novel methodological, theoretical and multi-level investigations.

## **Why study student entrepreneurship?**

The very first business schools were set up as collaborations between business people and economists. The oldest, *École supérieure de commerce de Paris (ESPC)*, was co-founded by the economist Jean-Baptiste Say and the trader Vital Roux in 1819. Their original curriculum was based on a combined theoretical and practical approach to business education. Since that time business schools have developed and evolved in a variety of directions and many have received critiques of their practice including an overemphasis on theory at the expense of practice, a retreat into single disciplinary siloes and a lack of critical consideration of the role of business within society (Martin, 2013, Starkey et al, 2004, 2009). However, some business schools have responded to this critique with an ideological return to the original purpose of business schools such as ESPC. Select business schools across the world are re-engaging with business people with a new sense of common purpose - to support and encourage student entrepreneurship (Wright et al., 2017).

Student entrepreneurship is defined as venture creation by students or recent alumni and is estimated to contribute up to 20 times more economic impact than venture creation based upon university intellectual property (Wright et al, 2017). Yet, research considering student venture creation has lagged behind that of academic venture creation due to a lack of formal data capture by universities and policy makers and a lack of appreciation of the economic and social impact of the phenomena amongst researchers. This is now changing - fast.

Student entrepreneurship appears within the strategic objectives of an ever growing number of universities, they gather data on it and proudly publish the successes of their entrepreneurial alumni. Yet the practices that encourage or constrain this activity are poorly understood. This may explain why there are a multitude of support structures, policies and practices in evidence with contradictory views upon their relative efficacy (Wright, 2014). Regardless of the approach taken, the most common academic department involved in

student entrepreneurship is the Business School, with Katz (2003) reporting over 2200 courses in entrepreneurship being taught worldwide. We propose therefore that academics within the business school are best placed to study this phenomenon from a data access perspective. Moreover, it can be argued that within the business school, there exists a plurality of theoretical traditions that when combined with this empirical access, could yield valuable new insights into the antecedents and consequences of student entrepreneurship.

Wright et al (2017) provide a useful framework to describe the different factors that may support or inhibit student entrepreneurship (Figure 1)

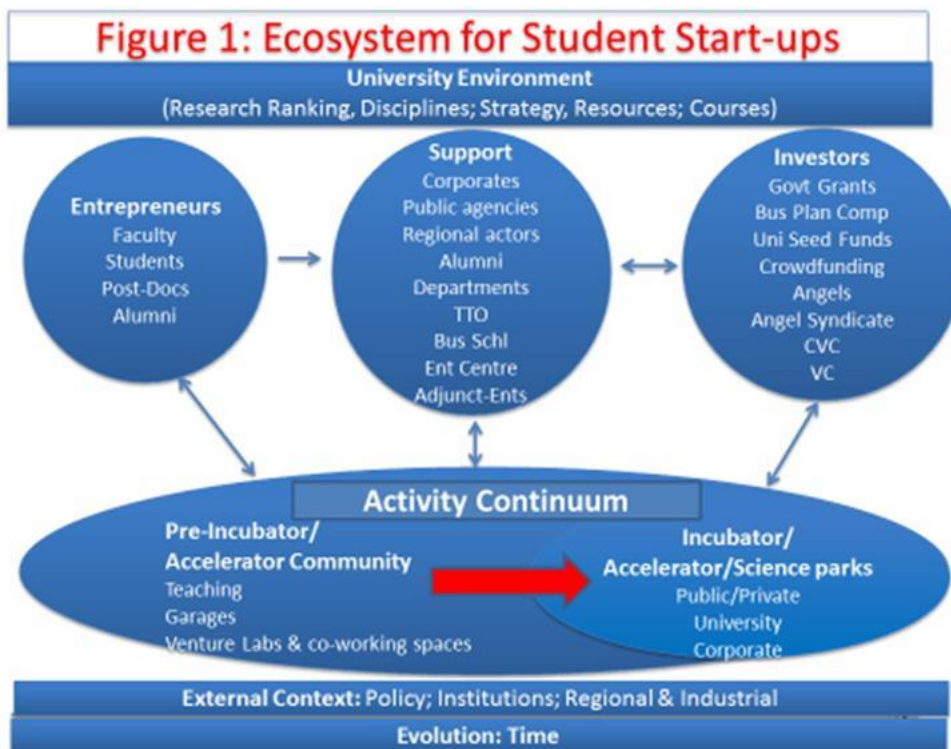


Figure 1: An eco-system for student entrepreneurship (adapted from Wright et al., 2017)

They take an ecosystem perspective towards student entrepreneurship highlighting the inter relationship between university mechanisms to facilitate entrepreneurship, entrepreneurship education, accelerators and incubators, regional support actors and investors, the specific nature of the university and local context and how these evolve over time. Autio et al (2017) advocate the value of taking an entrepreneurial ecosystems approach. They argue that eco-

systems are distinct from the more commonly studied innovation systems in their organization around entrepreneurial opportunity discovery and pursuit and in the existence of shared goals. They propose that understanding and explaining the performance of entrepreneurial ecosystems requires consideration of system level critical factors that cannot be meaningfully observed at an individual or institutional level of analysis. We therefore consider the different components of the student entrepreneurial ecosystem and consider the empirical and theoretical opportunities therein for academics based in the business school to exploit.

### **Empirical and theoretical opportunities to study student entrepreneurship**

#### ***University Environment and External Context.***

Considering the entrepreneurial ecosystem of student start-ups in Figure 1, we can isolate different areas that could be usefully examined through the deployment of novel theoretical approaches. For instance, considering the University environment, with the variety of research rankings, disciplines of study, strategic approaches, resources and courses offered. Fritsch (2001) observes that the traditional approach to evaluate the impact of the university environment upon innovation is through the relationship between the environment and university intellectual property and how that relates to innovation performance in recipient organisations. He advocates a need to also consider the influence of organisational and institutional differences between universities and how they manifest in different knowledge transfer outcomes such as collaborative research, consultancy and training. Hewitt- Dundas (2012) takes such an approach by categorising UK universities as either high or low research intensity. However, rather than finding the expected correlation between research rankings and knowledge transfer performance she finds a stronger correlation between strategic approach and the type of knowledge transfer activities Universities engaged in. She concludes that the culture and aims of the university appear more influential towards

knowledge transfer practices, than the resources available. This is a contemporary echo of Mintzberg's assertions on the relative efficacy of culture over strategy in general management (Mintzberg, 2004). For instance, Hewitt-Dundas (2012) found that universities resources deployed within technology transfer offices did not directly correlate to spin out performance, even when controlling for other resource effects. Taking an analogous approach towards the effect of university environment upon student entrepreneurship performance could also yield counter intuitive findings. At present it remains unclear whether there is a relationship between resource endowments in student enterprise centres and student venture creation. It may be the case that this relationship is moderated by, or indeed dictated by, the culture and strategic aims of the university.

Considering the potential influence of external context upon student entrepreneurship, Wright et al (2017) suggest evaluating the relative influence of regional institutions and regional policies. Fini et al (2011) provide a fascinating new approach for such an inquiry when seeking to disentangle the influence of universities and regional institutions and policies upon university spin off performance. They utilise the natural experiment provided by the different regions across Italy and examine how variance in University capabilities to build spin out companies is complimented by or substituted by regional institutions and policies. Using a multi-level and temporal analysis they find that regions and universities appear to have co-evolved where the university develop substitutes for deficiencies in regional support for USOs and vice versa. This approach could be gainfully employed to explore variances in regional support for student entrepreneurship. Mosey et al (2016) highlight the utility of the European context for conducting such multi-level studies. As Europe has nation states with defined regions where policy and institutional support for student entrepreneurship varies significantly then this provides numerous natural experiments

within which to tease out the relative efficacy of different approaches, whilst controlling for national policies.

*Student entrepreneurship activity with support actors and investors*

After considering the university environment and the external context, Wright et al (2017) highlight the need to consider interactions between the activity continuum of student entrepreneurship and support actors and investors. This area has a rich tradition of research which tends to be divided into two distinct areas. The most prevalent is research considering the pre incubator/ accelerator community where studies of the efficacy of entrepreneurship education dominate. Nabi et al (2017) conducted a systematic review of work in the field and noted the limitation that most work concentrated upon short term and subjective outcomes such as changes in student's entrepreneurial intentions or self-perceived entrepreneurial efficacy. This limitation is compounded by the few studies seeking to explore the relationship between entrepreneurial intentions and entrepreneurial actions reporting contradictory findings. A plausible explanation for such confusion is because the transition from intention to action is non-linear and therefore difficult to capture using cross sectional analysis (Bhave 1994). Nabi et al (2017) suggest that studies should therefore re-focus upon different impact indicators related to emotion and mind set and in this way unpick the different contextual factors that may influence the transition from intent to action.

Munoz et al (2011) took a novel approach in this regard when they looked at the effect of an experiential entrepreneurial education course upon students whilst controlling for gender, nationality, family background and entrepreneurial intent. They found that those students whose mind-set had changed were also capable of identifying more and better quality business ideas. Two aspects of this study could be usefully deployed in other contexts. The first was the method they used to capture changes in mind-set. Here, before they engaged in the course each student was asked to draw 'what do you think entrepreneurs

do and how they do it'. They were then asked to repeat the exercise after the course, during which they had direct experience of identifying business opportunities in conjunction with local entrepreneurs. This methodology draws upon the seminal work of Zuboff (1988), who argues that capturing visual data helps researchers to isolate information that students cannot communicate verbally as it is tacit in nature (Kearney and Hyle 2004). Ambrosini and Bowman (2001) propose that such techniques are an invaluable way to capture the tacit aspects of skills development. Asking participants to draw allows them to represent their thoughts more freely as in a mind map, a technique commonly used to help learning (Clarkson, 2008). As students were able to draw concepts and images they associated with entrepreneurial activity and depict the interrelationship between them this proved invaluable in ascertaining whether students entrepreneurial mind-set had changed as a result of their educational experiences. Two examples of such drawings are shown below. Figures 2 and 3 below show the drawings of Christopher, a student who did not develop his entrepreneurial skills during the course. Here it is clear that there is also a corresponding lack of change in his representation of the practice of entrepreneurship.

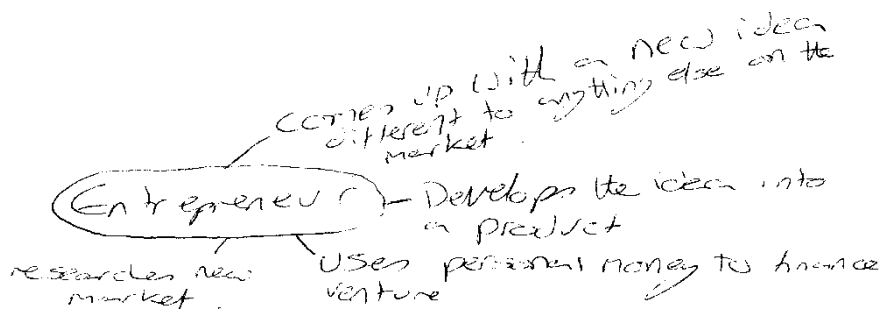


Figure 2: Christopher, first interview. Student who did not develop his entrepreneurial skills during the course



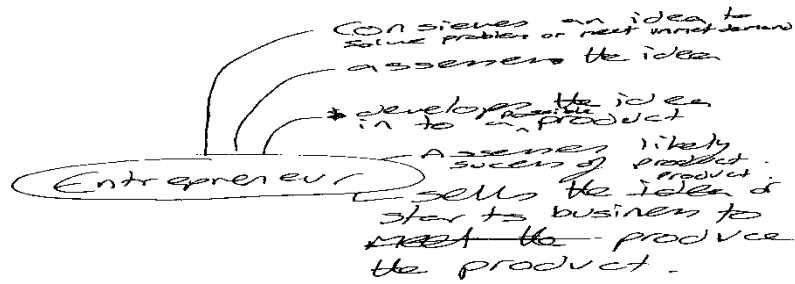


Figure 3: Christopher, second interview. Student who did not develop his entrepreneurial skills during the course.

By contrast, Figures 4 and 5 below show the drawings of Michael, a student who significantly increased his skills of identifying new business opportunities through taking the course. Here we can see a corresponding change in his understanding of the practice of entrepreneurship through the changes in his representation of entrepreneurship.

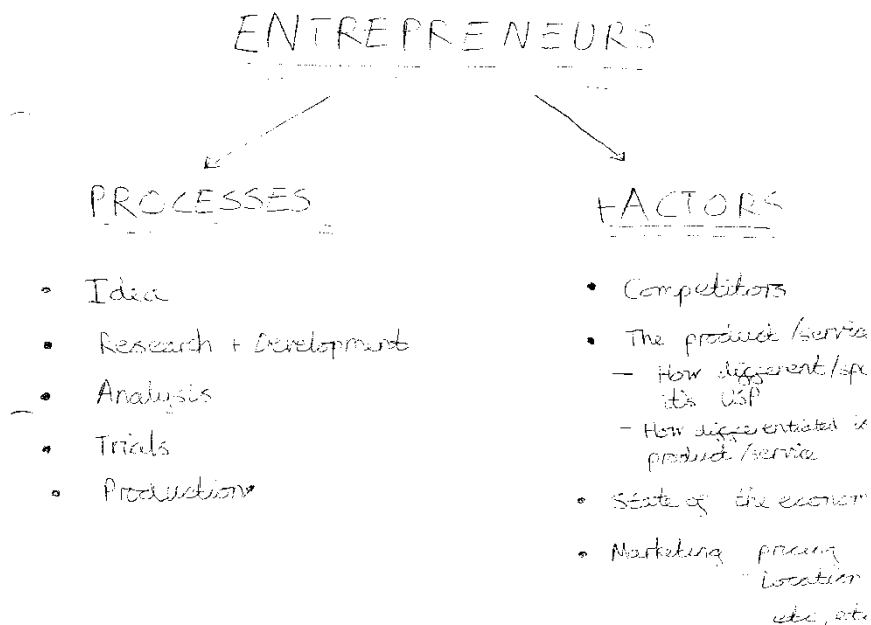


Figure 4: Michael, first interview. Student who developed his entrepreneurial skills during the course

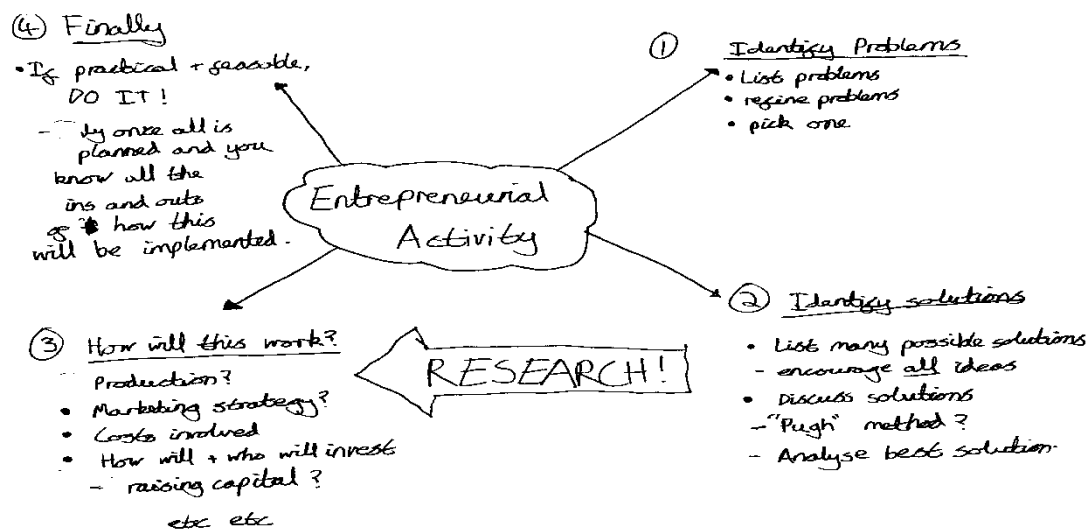


Figure 5: Michael, second interview. Student who developed his entrepreneurial skills during the course

We propose that such visualisation techniques could be gainfully employed to reveal new insights into how students' mindsets towards entrepreneurship may be affected by other activities such as hackathons, entrepreneurship garages and co-working spaces.

***The transition from student intent to entrepreneurial action***

A common critique of the prior art in entrepreneurship education is the opacity of the transition from changes in mind-set towards entrepreneurial action, illustrated by the arrow in the centre of Figure 1. Nabi et al (2017) echo Wright et al (2017) in calling for more research exploring those individuals that support the aspiring student entrepreneurs through this transition such as academics, entrepreneurs in residence and potential investors. They also propose that possible moderating factors such as culture, gender and identity could explain the contradictory findings across different national and cultural contexts.

One potential route through this opacity is the theoretical approach of sense-making. Originating within the organizational behaviour literature (McAdam & Marlow, 2011), sense-making occurs when a student turns their educational and networking experiences into words

and salient categories they can comprehend and then use for entrepreneurial action (Weick, Sutcliffe & Obstfeld, 2005). Sense-making is apposite for the early stages of entrepreneurship as it is triggered when there are discrepancies between expectations and reality. Such discrepancies can vary greatly and when the discrepancy between what a student expects and what they experience is great enough, and important enough, to cause them to reflect upon what is going on and what their actions should be then sense-making is triggered (Maitlis & Christianson, 2014). When students make sense, particularly with others such as local entrepreneurs or educators it can be thought of as “a matter of knowledge and technique applied to the world” (Weick et al., 2005:412).

Sense-making theory highlights three processual aspects where students may notice or perceive cues, create interpretations, and then take action. Within the organisational behaviour literature, sense-making has proven an insightful explanatory framework showing how leaders and managers make sense of significant organizational change (e.g. Gioia & Chittipeddi, 1991), organizational learning and innovation (Drazin et al., 1999). These three areas of research are relevant because they show that sense-making, which is often thought of as a reconciling mechanism during crises (Weick, 1993), also helps to explain processes that require disruption (Maitlis & Christianson, 2014). This makes sense-making a particularly insightful approach with which to explore the transition from intent to action for students, especially those that ultimately involve disruption of the status quo (Dimov, 2007).

Hoyte et al (2016) showed the promise of this approach when they considered the sense-making approaches of student entrepreneurs based within a university incubator in the UK. Using a qualitative longitudinal case study approach they reveal a typology of key sense-givers that the entrepreneurs draw upon to co-construct the idea and enact it into an entrepreneurial opportunity (Figure 6). These include family and friends, work colleagues, stakeholder partners such as entrepreneurs in residence and potential customers. Such an approach shows great

potential to contribute to the field of entrepreneurship by providing a theoretical language to describe how student venture ideas are translated into entrepreneurial opportunities. It identifies the critical role of specific sense-givers in legitimatising entrepreneurial activities and shows how a sense-making approach helps to reconcile contemporary debates surrounding the discovery or creation of entrepreneurial opportunities.

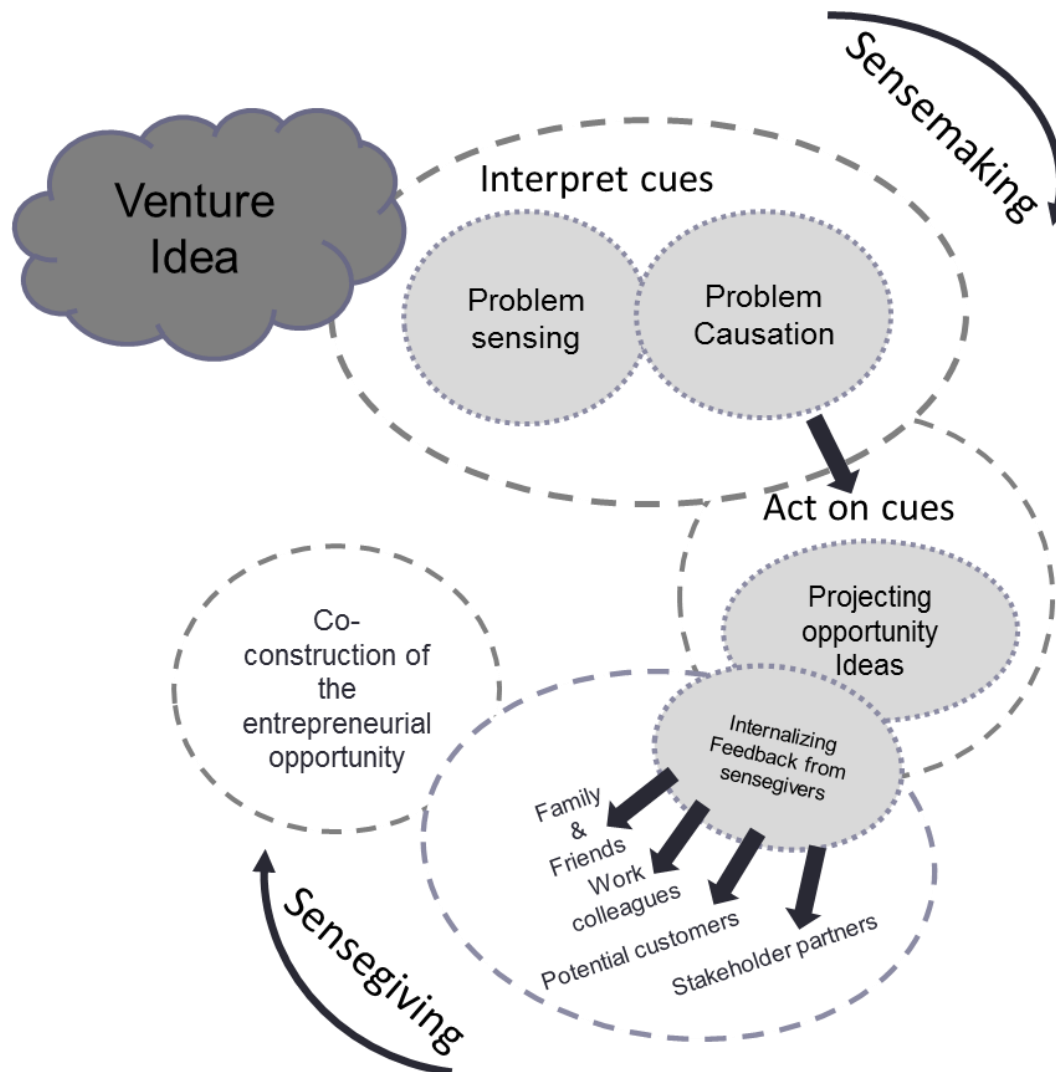


Figure 6. Translating Student Venture Ideas into Entrepreneurial Opportunities: The Role of Sensemaking and Sensegiving (adapted from Hoyte et al, 2016)

*Student entrepreneurship eco-system development and growth*

Returning to the level of the ecosystem, a key question remains regarding how the goals of the system are coordinated across the different stakeholders for mutual benefit and ecosystem growth (Autio et al, 2017). One possible answer to the coordination conundrum is through the use of Grand Challenges. The concept of Grand Challenges was first expounded by Hilbert over one hundred years ago<sup>1</sup>. Perhaps the most widely adopted Grand Challenges today are those adopted by 193 member states of the UN in 2015. These consist of 17 Sustainable Development Goals (SDGs) ‘to end poverty, protect the planet and ensure that all people enjoy peace and prosperity<sup>2</sup>.’ George, et al (2016, p1880) insist that Grand Challenges ‘by their very nature, require coordinated and sustained effort from multiple and diverse stakeholders toward a clearly articulated problem or goal.’ And that ‘The elegance of the SDGs are in the articulation that human progress stems from achieving these clear targets through collective, collaborative, and coordinated effort.’

They define grand challenges as:

*'Specific critical barrier(s) that, if removed, would help solve an important social problem with a high likelihood of global impact through widespread implementation'* and argue that ‘...tackling GCs could be fundamentally characterised as a managerial (organisational) and scientific problem’. (George et al (2016, p1881)

However, the insistence on top down co-ordination is not uncontested. For example in many ways the mobile phone has become the enabling technology of the developing world. And yet the idea of providing near-universal access to the internet through an affordable hand-held

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<sup>1</sup> The term “grand challenge” begins with the efforts of Dr. David Hilbert, a German mathematician later recognized as one of the most influential 20th century mathematicians, who, in 1900, at the International Congress of Mathematicians in Paris, listed a set of 23 problems that were collectively termed as “grand challenges”

<sup>2</sup> <https://www.sciencedirect.com/science/article/pii/S0263237314000425?via%3Dihub>

device was not one of the UN's Millennium goals. Traditional economists may see an invisible hand at work that defies co-ordination and control but an alternative view is that such paradigm shifts occur when multiple factors are aligned. And so we believe it is possible, also perhaps desirable, for smaller players, such as those found within student entrepreneurial ecosystems, to respond to grand challenges piecemeal. In practical pedagogical terms this approach encourages and recognises entrepreneurial talent among those students who do not readily identify with the reified stereotypical image of the entrepreneur (Hebert and Link, 2006) and may therefore provide that crucial coordination mechanism between student, university, local policy makers and local businesses.

To investigate this phenomenon, Avram and Carter (2018) have deployed constructs from organisational psychology to explore whether students working on grand challenges helps to coordinate their activities within a nascent entrepreneurial ecosystem. They theorise that “collective intelligence” plays a key role in predicting entrepreneurial team performance across tasks and seek to explore early entrepreneurial activity by including team characteristics and processes. Using data from digital learning platforms, they were able to analyse a unique dataset of student-generated ideas and solutions to grand challenges, and found a complex picture of performance at the intersection of psychological, cognitive and behavioural factors. Their findings suggest that working on grand challenges helped to enhance team members perceptions of psychological safety and functionality. They concluded that team members' personality characteristics such as openness to experience and extraversion to be moderating factors conducive to enhanced entrepreneurial team performance.

Such insights into the micro foundations of entrepreneurial ecosystems provide intriguing potential explanations for unexpected findings from larger scale macro studies.

Ratzinger et al (2017) used a novel data set by drawing from information on more than 220,000 start ups on the crowdsourced platform Crunchbase. They showed that such a data set can be as robust and reliable as traditional survey data by conducting statistical comparisons with GEM data and gender studies (Coleman and Robb, 2009) and offers the added advantage of a global population within which to consider student entrepreneurship.

They sought to investigate the impact of higher education upon a founding teams probability of securing equity investment and subsequent exit for their digital ventures. Across this unique global data set, they found confirmatory evidence that teams with a founder with technical higher education are more likely to secure equity investment and exit for their ventures than those that do not. However they uncovered some counterintuitive findings that suggest rich seams of future inquiry.

They found that teams with a founder with doctoral level business education had a higher probability of securing equity investment whilst undergraduate business education had no significant effect, suggesting that increased human capital within business education provides performance benefits.

By contrast, they found that teams with a founder that had an undergraduate education in the arts and humanities were also more likely to secure equity investment and exit. This suggests that the experience of studying subjects other than businesses or STEM has utility for student entrepreneurship that clearly requires further study.

Finally, they found that teams with a founder with postgraduate or doctoral education in the arts and humanities had no significant effect upon securing equity investment and exit. This suggests the possibility of an inverted u shape relationship between the human capital gained through arts and humanities study and subsequent entrepreneurial performance, which

could be explored further by using the organisational psychology constructs introduced by Avram and Carter (2018).

This leaves us with the tantalising possibility that student entrepreneurial ecosystems working on Grand Challenges may be the coordinating mechanism by which C.P. Snow's two cultures of the humanities and sciences can be reconciled (Snow, 1963). And that we, as Business School academics, have a ringside seat from which to observe, categorise and hopefully contribute towards this exciting phenomenon.

## **Conclusions**

As academics in the Business School we have a fantastic opportunity to evaluate and help shape a contemporary mission of Universities globally – to encourage the creation and development of student entrepreneurship.

Empirically, student entrepreneurship represents a growing and relatively accessible phenomena that, somewhat unusually, has the unequivocal support of university leaders, academics, national and regional policy makers, not to mention the students themselves.

Theoretically, student entrepreneurship presents an ideal opportunity to experiment with frameworks and constructs from long established fields such as organisational behaviour and psychology to add richness to the theoretical language we use within entrepreneurship and management more generally.

Student entrepreneurship has the potential to take universities back to their original role of engines of local economic development. Taking an ecosystem approach shows how this role may manifest through the complex and non-linear interaction of environmental, institutional, social and individual factors. Although the direction of causality remains unclear, it seems



apparent that the iteration between universities, student entrepreneurs and regional actors, if appropriately coordinated, leads to significant economic impact.

It is now up to us to explore, codify and explain this phenomenon.

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