

An emerging ecosystem for student start-ups

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Abstract New initiatives in student entrepreneurship programs are moving rapidly beyond traditional classroom teaching to experiential learning, which is associated with improved employment outcomes for students (Gosen and Washbush in *Simul Gaming*, 35:270–293, 2004). Unfortunately, we lack a framework to understand the ecosystem required to enable our students to launch successful startups. In this article, we develop such a framework. The elements of this framework include university mechanisms to facilitate student entrepreneurship, along with a continuum of involvement from pre-accelerators through to accelerators; the involvement of a variety of entrepreneurs, support actors and investors; the particular nature of the university environment and the external context; and their evolution over time. We also consider the important issue of funding mechanisms.

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1 Introduction

There is an ongoing debate regarding the nature and effectiveness of entrepreneurship education in preparing students to become successful entrepreneurs. The conventional wisdom is that traditional entrepreneurship education programs induce students to become entrepreneurs (Pittaway and Cope 2007; Bae et al. 2014; Souitaris et al. 2007; Wilson et al. 2007) and also enhance their opportunity recognition skills (DeTienne and Chandler 2004). There is more debate, however, regarding whether such programs enable students to become more effective entrepreneurs. Martin et al. (2013) conducted a meta analysis of 42 such studies and found that there is a significant relationship between entrepreneurial education and training and entrepreneurship outcomes. Other evidence suggests the importance of learning from classmates with entrepreneurial experience rather than from an instructor or from business plan competitions. These activities influence the extent and nature of student entrepreneurship, as this provides critical evaluation of students' business idea (Lerner and Malmendier 2013). Individual characteristics also appear to play an important role. According to Backes-Gellner and Moog (2007), students with a more balanced portfolio of human and social capital are more willing than those with more specialist human and social capital to become entrepreneurs.

The creation of a new venture by students or recent alumni is also influenced by the university context and especially, the characteristics of the region within which a university is located (Bergman et al. 2016; Hayter et al. 2017). This finding indicates that while individual characteristics and education programs are influential, importance is attached to the coordination of university programs with the wider entrepreneurial ecosystem and the development of such an ecosystem.

In general, entrepreneurial ecosystems regulate the nature and quality of entrepreneurial activities by shaping the direction and potential rewards associated with opportunity identification, creation, and pursuit and by also establishing the types of organizational forms that will be accepted as legitimate (e.g., the creation of a firm). Entrepreneurial ecosystems involve multi-level processes and stakeholders, multiple actors and multiple contexts (Isenberg 2010).

An entrepreneurial ecosystem for students has many dimensions. It includes entrepreneurship courses, incubators, accelerators, grants, and business plan competitions. Such an ecosystem also has vital formal and informal rules and regulations governing a society (North 1990; Autio et al. 2014). Formal institutional features include the rule of law and property rights. Informal institutional mechanisms refer to sanctions, traditions, and codes of conduct.

These institutions constitute the rules of the game. For entrepreneurship, they can also include norms, such as respect for entrepreneurship as an honorable activity and tolerance of failure. More tangible support can also come from public infrastructure to support entrepreneurship, such as incubators or grants, and successful entrepreneurs serving as mentors. What Kenney and Patton (2005) called "entrepreneurial support networks" (e.g. actors as venture capitalists, lawyers, and accountants) are also formal institutions assisting the formation and growth of entrepreneurial firms. Informal institutions include the wider culture (Stephan and Uhlander, 2010) and social norms (Webb et al. 2009).

There is a strong need to understand the factors that characterize such an ecosystem and what role these factors play in the success of student start-ups (Van de Ven et al. 1999). Currently, we lack an overall framework for understanding the ecosystem that supports student entrepreneurship.

The absence of such a framework is problematic, given that we have recently witnessed a proliferation of initiatives that move beyond traditional class room teaching and business plan competitions. Many of these initiatives involve more experiential learning, including garages, creativity labs, and other programs designed to have students actually create a venture. From a policy perspective, such a framework may provide the basis for more effective policy interventions at both governmental and university levels, especially as the number of ventures created by students and graduates far outweighs those created by faculty (Astebro et al. 2012). From a research perspective, such a framework is important for understanding the drivers and processes of student entrepreneurship, as well as for analyzing the most effective contexts and support for mechanisms. Accordingly, in this article we seek to develop a general framework for understanding the student entrepreneurship ecosystem.

The elements of such an ecosystem for student entrepreneurship are outlined in the framework shown in Fig. 1. University mechanisms to facilitate student entrepreneurship can be viewed as involving a continuum of involvement from entrepreneurial awareness via conferences, through to accelerators or university seed money funds for student projects. To function, these mechanisms require the involvement of a variety of entrepreneurs, support actors and investors. As one size does not fit all, the operation of student start-up activities is expected to be contingent upon the particular nature of the university environment and the external context. Given that the ecosystem and the nature of student start-up activities are both dynamic, there is also a need to understand how their evolution interacts. We elaborate on this framework in what follows.

This framework is intended as a map of all the elements our empirical research on real EES in different countries has collected.

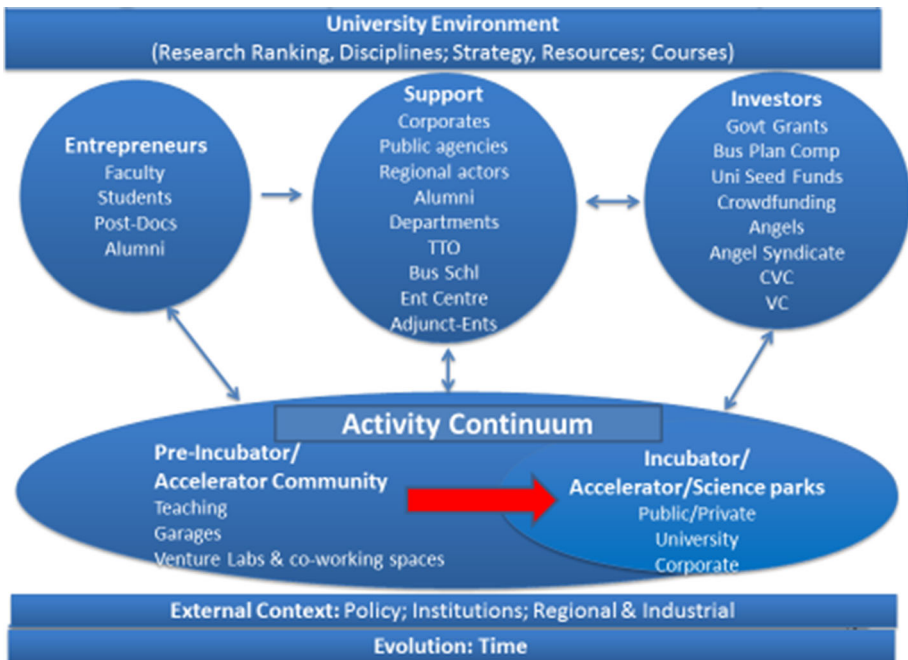


Fig. 1 Ecosystem for student start-ups

2 University environment

One element of the framework concerns the variety of university contexts, in terms of scale, scope, research quality, history and culture, location and local networks, resources and capabilities. Heterogeneity among universities has important implications for the extent and nature of spin-offs by academics (Clarysse et al. 2005). That is, universities may have different objectives and strategies relating to academic entrepreneurship, which will affect student entrepreneurship. For example, these institutions vary substantially, in terms of scale, scope, and areas of specialization. Universities with strong, world class science, medical and engineering, as well as computer science faculties, may be able to generate different types of student entrepreneurship than those colleges or universities focused on arts and social sciences.

The university context also influences the extent and nature of the resources and capabilities that universities are able to provide to support faculty and student entrepreneurship (Mustar et al. 2006). A mismatch between university objectives regarding the promotion of entrepreneurship and the resources and capabilities they commit to achieving this objective are well-known (Clarysse et al. 2005). This potential for mismatch may need to be addressed in the design of an entrepreneurial ecosystem to support student entrepreneurship at a given university. Well-endowed universities and those with extensive alumni bases may be better placed to tap into donors to fund support for student entrepreneurship.

Another key dimension of the ecosystem is the historical trajectory and culture of a university. Some universities have a teaching focus, while others are focused on research. Public universities, especially land-grant universities, also have a strong economic development mission, which complements any efforts to enhance academic entrepreneurship and student entrepreneurship. Private universities are typically not as engaged with their communities as public institutions. Even universities within the same strategic group, such as Research 1 universities in the US or the Russell Group of leading universities in the UK, may differ in how they view their role in promoting the development of entrepreneurial activities by faculty and students. This role may be anchored in the past and constrain how and to what extent a particular university develops an ecosystem for student entrepreneurship. For example, Holstein et al. (2016) examine how the different approaches to the development of entrepreneurial activities by two research intensive universities in the UK were influenced by differences in their relationship with the local region. In one case, relations were considered historically problematic and the university saw itself as having an international perspective, while in the other case there was a closer regional link tightly associated with its civic past. Such differences have implications for how universities are able to reach-out to the local and regional community in order to participate in the building of the ecosystem for student entrepreneurship.

3 External context

Drawing on recent research on contextual factors influencing entrepreneurial ecosystems (Autio et al. 2014; Zahra and Wright 2011), we conjecture that the ecosystem is influenced by the university's external environment, including the nature of the local, state, regional and national government policy stances towards university entrepreneurship, government objectives concerning the role of universities in society, and the ownership of IP between

universities and faculty/students. Country, regional and industrial contexts provide variety in their access to customers, suppliers, finance, human capital and other resources (Wright et al. 2006, 2008).

Different countries have adopted different support mechanisms with their being little evidence of convergence. For example, UK universities have developed diverse approaches to academic entrepreneurship within a policy context to develop faculty spin-offs as part of a third stream of financing and with policy schemes generating revenue directly to universities. However, a recent shift in UK policy places greater emphasis on the indirect contribution of universities through developing the human capital of students that arises through their creation of entrepreneurial ventures (Wright 2014).

In contrast, in France, policies to promote academic entrepreneurship are subsumed in a broader initiative on the part of the national government to stimulate technological entrepreneurship (Mustar and Wright 2010). Policy in France has shifted recently from support for faculty and research staff spin-offs to student spin-offs. In 2014, the French government launched a national policy to foster student entrepreneurship. Its main measure is to create an *Entrepreneur Student Status* for all the students who have an entrepreneurial project during or just after their studies.

Students with an interest in entrepreneurship need to decide how, when, and where to launch a startup company. These decisions are influenced both by where the best opportunities exist and also by the extent to which student entrepreneurs are locally embedded (Larson et al. 2016). Swedish data suggests that 65% of graduate entrepreneurs start businesses in their region of graduation, while 35% start businesses elsewhere. Swedish evidence suggests that the presence of university peer entrepreneurs and entrepreneurial family members in the local region exert a stronger influence on graduate entrepreneurs' location choice than the availability of opportunities. This finding has important implications for universities, given that most graduates choose to launch their startups in the same region as the university. Such a result suggests that there may be benefits for universities in developing incubator spaces and entrepreneurship garages (see below) to facilitate start-ups by students prior to graduation. These initiatives may help them reach out to the local external entrepreneurial ecosystem and accordingly address some of the early challenges faced by nascent ventures within a supportive environment (Amezcuca et al. 2013; Siegel and Wright 2015a).

4 Evolution—time

Our framework also recognizes the importance of the time dimension, given that the ecosystem for student start-ups is evolving. It takes time to develop the resources and capabilities to enable entrepreneurial ecosystems to function (Clarysse et al. 2005). Changes in government policy and university strategies, as well as overcoming the challenges of implementation also mean that evolution is unlikely to be linear as path dependencies need to be shifted and adapted.

Technological change also compresses the time dimension of the engagement of students in entrepreneurship. The importance of time is also enshrined in the concept of university technology transfer and academic entrepreneurship. As noted in Siegel et al. (2003), passage of the Bayh–Dole Act in 1980 dramatically changed incentives for universities to engage in academic entrepreneurship. Bayh–Dole, which has been adopted in other countries, enabled universities to own the patents that arise from federal research

grants. The framers of this legislation asserted that university ownership and management of intellectual property would *accelerate* commercialization because universities would now have greater flexibility in negotiating licensing agreements and firms would be more willing to engage in them. It appears that Bayh–Dole has indeed resulted in a more rapid rate of technological diffusion and universities have developed numerous program and initiatives to involve students in entrepreneurial activity as well (Grimaldi et al. 2011).

Another major event that has stimulated student entrepreneurship is the rise of the Internet, which has greatly reduced start-up costs (and reduced entry barriers). The concomitant widespread digitalization of the economy has also had a strong impact on student start-ups. On the one hand, this impact arises through the expansion of the creation or discovery of business opportunities (e.g. the development of the sharing economy) and on the other by making opportunity pursuit/firm creation easier (e.g., free turnkey website, free software bricks, social networks for marketing, secure online payment facility, cloud storage services for data, etc.-see Hayter 2016).

5 Investors

There are several types of potential investors in student start-ups.

5.1 Venture capital firms (VCs)

VCs typically have minimum size of investment thresholds, which are usually out of reach for the student start-ups. Indeed, VC funding seems even less likely to apply at the early stages of student start-up development than it does for faculty spin-offs from universities (Lockett and Wright 2005; Fini et al. 2016a, b). Studies indicate that besides the amount of funding demanded, few faculty startups have the prospective growth that VCs seek nor are they at the point where they are ‘investor ready’ for VC funding (Wright et al. 2006).

Student start-ups are generally less likely to involve formal mechanisms of intellectual property, such as patents. While students may need to be aware of what VCs look for in making investments, student entrepreneurs on in our courses struggle to see the relevance for their proposed ventures. Instead, student entrepreneurship courses covering finance increasingly need to give pre-eminence to other source of funding.

5.2 Business angels and angel syndicates

Business angels are individuals investing their own money generally into new and growing privately owned ventures. Many angel investors bring not only finance to the business but also access to business experience, strategic advice and market and customer contacts (Fraser et al. 2015). Business angels may invest on their own, but frequently they operate as part of a group of angels, referred to as a syndicate or network. Traditionally, business angels have been mostly highly experienced white male entrepreneurs or managers, recent evidence indicates a substantial increase in the number of women and younger angels (Wright et al. 2015). Many younger angel investors have had experience as high-tech entrepreneurs, especially in ICT, sectors. Business angels also play a significant role in social entrepreneurship, which is of great interest to would-be student entrepreneurs. About a quarter of angels have invested in ventures that have a social impact (Wright et al. 2015).

Crowdfunding has emerged recently as an important mechanism for attracting modest amounts of funding for entrepreneurial ventures (see Bruton et al. 2015). Entrepreneurs seek funding by making pitches to the network of investors who have signed up to the platform. Crowdfunding platform managers typically engage, to differing degrees, in some form of screening of offerings. Once accepted, a pitch is usually live on the platform for a fixed period. Platforms typically have an all or nothing approach, meaning that crowd-funders cash in the money only if the capital pledged at the closure of the campaign ends is at least equal to the funding goal.

At the end of 2011, there were 453 crowdfunding platforms globally, raising total funds of \$1.5 billion. By May 2013, there were around 1000 platforms with estimated funds raised of \$5.1 billion (Massolution 2013). The World Bank estimates that the world crowdfunding market will expand to \$93 billion by 2025 (Kshetri 2015).

There are several types of crowd funding mechanisms. Donation crowdfunding platforms finance projects by securing small donations from a large number of donors. Reward platforms source small amounts of money from individuals in exchange for rewards. Kickstarter is one of the largest rewards based crowd funding platforms. Lending platforms borrow from the crowd with individuals contributing small parts of the overall loan amount. Equity crowd funding platforms seek investment from the crowd in exchange for a share in the entrepreneur's business or project.

In contrast to other forms of crowdfunding, equity crowdfunding investments tend to be somewhat larger, with a smaller set of investors. Equity crowdfunding has grown rapidly in recent years and now accounts for 15.6% of total UK seed and venture-stage equity investment (Nesta 2016). Individual lead investments in pitches are routinely between £100,000 and £200,000; and depending on the model that the equity crowdfunding platform follows, average investments are between £1000 and £3000 (Estrin and Khavul 2016). Even so, the minimum investments of £10 remains popular with many investors. Different models of equity crowdfunding have emerged involving nominee (Seedrs), individual (Crowdcube), syndicated shareholdings (Syndicatoroom) and fund structure approaches. These different platforms introduce different roles for individual retail investors compared with more 'sophisticated' angel investors and angel syndicates. Recent evidence indicates that some 45% of business angels are now investing alongside crowdfunding platforms (Wright et al. 2015).

5.3 Grants, business plan competitions, and university seed funds

Some governments have introduced grants to support directly or indirectly the development of student entrepreneurship. In France, for example, the Ministry of National Education, Higher Education and Research has created the Price PEPITE-Tremplin for Student Entrepreneurship in 2014. For the 2016 version of the program, nearly 600 start-ups created by students or who have a start-up project took part. The jury issued 53 awards to "laureates," who are students or young graduates, aged under 29, who started their business after the 1st July 2015 or who carry out an innovative start-up creation project. These laureates receive a prize of € 10,000 or € 5000, awarded on the actual creation of the company. Three Grand Prizes of € 20,000 are awarded to the most promising projects. 60% are still students and 40% are young graduates. Nearly 47% of the laureates are studying for a Masters degree or have a Masters degree, 10% have or are studying for a PhD and 32% pursue engineering studies (11% are in other training). 25% of the laureates are women (http://cache.media.enseignementsup-recherche.gouv.fr/file/Mediatheque/09/0/DP_Pepite_2016_vdef_658090.pdf).

These competitions also exist at the university level. For example, in the UK, the Cambridge University Entrepreneurs (CUE) competition and competitions organized by UCL Advances: one for undergraduates and another one for post-graduates.

Although there is some debate about the usefulness of business plans for entrepreneurs (Honig and Karlsson 2013; Burke et al. 2010), many universities and associations of universities run business plan and pitching competitions where the winners receive funding to develop their proposed ventures. These competitions may be funded by universities themselves or corporate and other philanthropic sponsors. Some universities have also established seed capital funds to help support early stage ventures run by students.

6 Support

Support mechanisms for student entrepreneurship can be provided by actors who are internal or external to the university. Internal university actors include administrators involved in sponsored research and the commercialization of university research, university entrepreneurship centers and other research centers that partner with industry department chairs that champion entrepreneurship (Bercovitz and Feldman 2008), and some faculty. Within universities, technology transfer offices (TTOs) have focused on providing support for faculty and post-docs to create spin-off ventures. There is some debate about the effectiveness of the support for entrepreneurship provided by TTOs (Siegel and Wright 2015). Some TTOs have not traditionally seen their role to be to support student entrepreneurship, although this is beginning to change. Business schools are also starting to work with TTOs, and of course, their students are working with science and engineering faculty and students through business plan and co-working projects (Wright et al. 2009).

University philanthropy and development officers can play a support role for student entrepreneurship in attracting funds through gifts or investments from alumni and other contacts. Of course, some alumni may not be willing to provide a gift but they may be willing to make an investment in a student venture. Given the challenges that often arise in persuading alumni to make a cash contribution, there may be an important need to develop joined-up parts of the ecosystem so that potential relationships and donors that may be of interest to other part of the ecosystem are not lost. Specifically, while key performance indicators for philanthropy officers may not include attracting investors, other parts of the university, such as student entrepreneurship centers and pre-accelerators may be keen to collaborate with them.

While career service professional at universities have traditionally been geared to placing students with corporate employers or further education, the emergence of student entrepreneurs presents an opportunity and a challenge for them to adapt the support they provide.

External actors include corporations, foundations, and public sector institutions at the national and state/regional levels. Corporations can provide support in terms of sponsoring awards and business plan competitions, as noted above. Alumni and adjunct professors can provide a bridge between the internal and external environment through their roles as entrepreneurs in residence or as teachers of entrepreneurship and coaches of entrepreneurial creativity and business plan development.

In the UK, for example, the Innovation and Digital Enterprise Alliance London (IDEALondon) is a collaboration involving Cisco, DC Thomson and University College London (UCL) to promote digital innovation and entrepreneurship. UCL's role is to help with training the young entrepreneurs and to provide them mentors. Cisco is interested in firms in the field of Internet of Things and provides them technical training and financial

support and equipment. DC Thomson is interested in publishing projects and help them with funding and networking opportunities.

7 Entrepreneurs

Besides under-graduate and post-graduate student entrepreneurs, faculty, post-docs, and alumni (who have become entrepreneurs) are part of the ecosystem. Faculty with entrepreneurial experience play a significant role in supporting other faculty who are new to the spin-off process (Mosey and Wright 2007). Similarly, such faculty may possess important experientially based skills that can make them more effective as coaches and mentors for student entrepreneurs.

Alumni who have become entrepreneurs may also be attracted to contributing to the ecosystem by serving as mentors, coaches, or as an adjunct or visiting professor, or as an entrepreneur in residence or professor of practice. Alumni who have become successful professionally or as entrepreneurs may also have a role as investors and advisors to university funds targeted at student entrepreneurs.

Societies play an important role in the support of student entrepreneurship organizing many networking events to create links between students from different department. For example, Cambridge University Entrepreneurs (CUE) organizes business and entrepreneurial events and training opportunities for students throughout the year is a central part of Cambridge University's ecosystem for supporting entrepreneurship. Since 1999, CUE has been running a student start-up creation competition.

8 Activities—pre-accelerators to accelerators and incubators

Universities have developed a continuum of support activities, ranging from very early stage support of embryonic venture ideas ready, to the next phase of development, involving an incubator or accelerator.

Incubators and accelerators help shape the business idea further and identify investors and potential markets. Incubators and accelerators may be publicly or privately owned and run. They may be part of the university or closely linked to corporations.

Incubators' main components include at least four of the five following services: (1) access to physical resources; (2) office support services; (3) access to capital; (4) process support; and (5) networking services. Among the different types of incubator models, university incubators have been established to facilitate technology commercialization (Barbero et al. 2014). Incubators have evolved over time from being primarily focused on providing office space and in-house business support services, to providing services such as aid in evaluating different market opportunities, access to knowledge intensive services, product development support, access to networks of entrepreneurs and provision of entrepreneurial finance (Bruneel et al. 2012). They have also become more specialized over time (Phan et al. 2005).

Accelerators are organizations that emerged over a decade ago as a response to the shortcomings of previous generation incubation models and that aim to accelerate successful venture creation by providing specific incubation services, focused on education and mentoring, during an intensive program of limited duration (Pauwels et al. 2016).

Very early stage pre-accelerators may involve hands-on teaching, so-called entrepreneurship garages as well as venture labs and co-working spaces. These

mechanisms essentially help student entrepreneurs to develop embryonic venture ideas. For example, Imperial College CreateLab is an innovation community and pre-accelerator (open to all students of the College) involving collaboration between Imperial College students, faculty and the UK's leading technology investors Imperial Innovations.

The dividing lines between incubators, pre-incubators, accelerators, etc. are somewhat fuzzy. This is shown by the term “**start-up garage**”, much in vogue, which is highly indicative of the hybridization between different elements of the ecosystem.

Thus, at Stanford University, the Startup Garage is an intensive hands-on, project-based course in which students design and test new business concepts that address real-world needs. So this Garage is a **class** where students learn to apply the concepts of design thinking, engineering, finance, and business organizational skills. By the end of the course, teams will have developed, prototyped, and tested a novel product or service, a business model, and a company creation plan.

(<https://www.gsb.stanford.edu/stanford-gsb-experience/academic/entrepreneurship/startup-garage>).

In contrast, in Tallinn (Estonia), the Startup Garage is a student-led initiative to encourage technology-based entrepreneurship. This is a **meeting place** for students, to develop new technology startups by bringing together young talent, researchers and experienced entrepreneurs in an attempt to change the lack of entrepreneurial culture, risk-taking and starting of new ventures. The Startup Garage organizes field-specific startup nights focusing on specific industries, teambuilding (TeamUp!) between engineers, designers and marketing and an entrepreneurial summer of startups program (<http://www.startupgarage.eu>).

Another variant is the Startup Garage in Ottawa, an initiative of the University of Ottawa's Innovation Support Services to foster and support youth entrepreneurship in the Ottawa area. The 3-month program offers selected youth-led ventures the opportunity to accelerate their business by providing them with funds (Up to \$18,000), a workplace, mentorship from business experts and training (marketing, financing, pitching, etc.). This is an **incubator program**. (<http://www.startupgarage.ca/index.html>).

A fourth model, which is somewhat similar to the Stanford model since it has an educational component to it, is the Syracuse Student Sandbox. The Sandbox, which is a part of Syracuse's Tech Garden, is an incubator whose objective is to enable student entrepreneurs to “push their venture from idea to company.” It was established in 2009, and over the past 7 years, has assisted approximately 200 student start-ups from Upstate New York via mentoring and coaching. It is important to note that a key feature of the Syracuse model is that the facility is open to all college or university students in the region (e.g., students from Le Moyne College and Cazenovia College), not just to Syracuse university students. The underlying philosophy behind that approach is that fostering student entrepreneurship may be a viable economic development strategy in a depressed region (e.g., upstate New York) with a large number of college and university students.

9 Discussion and conclusions

9.1 Ecosystem challenges

The ecosystem framework we have outlined is comprehensive but also complex. A number of potential challenges need to be addressed.

A key challenge concerns the question of who designs the ecosystem. As we have shown, an ecosystem is a result of various mechanisms and actors, in different contexts and evolves over time. Although universities play a crucial role in this process, they do not drive it. Student entrepreneurial ecosystems are co-created rather than one institution being at the centre of the process and managing it. Many stakeholders are engaged as co-creators: students, faculty, university managers, investors, angel networks, local authorities, start-ups and corporation. Each of these stakeholders has different objectives, norms, standards, and values. Thus, many dimensions of the ecosystem go beyond actions by universities.

This means that it is difficult to create a student entrepreneurship ecosystem from scratch or in a vacuum. Existing start-ups and entrepreneurial projects are needed, if not there will be no users for the creation of pre-incubators, incubators, accelerators, grants and seed money funds, etc. University, alumni, local authorities, existing start-ups and large firms can put in place actions and tools to accompany the process of constructing or accelerating the development of the ecosystem.

Thus, a major challenge is: to what extent are ecosystems for student entrepreneurship deliberately designed top down or emerge organically from below? The complexity and variety we have identified suggest the need to develop mechanisms for bringing together the range of different stakeholders. Universities likely need to develop extensive and deep networks with these stakeholders for these mechanisms to be effective. These networks need to be able to link the different elements and levels of the ecosystem. This raises issues concerning whether one single ecosystem is feasible for a particular university or whether developing several sub-ecosystems piecemeal is likely to be more feasible.

Different parts of the ecosystem may have different and conflicting goals. For example, different departments and school within universities may have different goals regarding entrepreneurship and may seek to construct their own ecosystem for entrepreneurship. In U.S., for example, there is often a battle between engineering and business schools regarding which unit will serve as the hub for entrepreneurship. These problems may be exacerbated with respect to support providers and investors from outside the university who may have purely financial goals as we have seen with respect to potential conflicts between the goals of development (fund-raising) officers and student pre-accelerators.

Given that a key element of the framework concerns the need for a range of mechanisms to support the variety of entrepreneurial actors and activities, a major challenge therefore concerns how an ecosystem is to be constructed and how resistance is to be overcome. It is important to note that the word “entrepreneurship”, student or otherwise, has a negative connotation for many academics and students on campus, especially those in the humanities and social sciences. There may also be resistance to entrepreneurial initiatives if they are viewed as being “top-down,” and thus, less subject to faculty governance. There is some evidence that actors involved in academic entrepreneurship can emasculate top down policy and strategies (Lockett et al. 2015) and the challenges may be more complex in developing entrepreneurial ecosystems that promote student start-ups. There is therefore a need for policy and practice to find ways of reconciling top down and bottom up approaches.

A further challenge to the development of ecosystems for student entrepreneurship that take account of local contexts concerns the harmonization across different regions and countries of common methods by students to identify, create and pursue opportunities. A number of structured tools, methods and concepts for the enactment of student entrepreneurship have become widely used across the world, such as the lean start-up process (Ries 2011) and business model approaches (Pigneur and Osterwalder 2010). Other powerful mechanisms that have spread worldwide involve community based initiatives

such as the Slush event, the Global Entrepreneurship Week and the Start-Up Week-end aimed at start-up entrepreneurs including students. Nearly 3000 start-up weekends have been organized in more than 150 countries in the last year (<https://startupweekend.org/>), including that in Marrakech in February 2016 which welcomed 400 participants, of whom 83% were students. These events contribute (with their highly structured processes) to the development of a global entrepreneurial culture which strongly attenuates local particularities.

9.2 Implications

This framework provides a number of implications for policy and research. It is evident that a once-size-fits-all approach to ecosystem design is too simplistic. The complexity of the ecosystem poses major challenges for its effective implementation. Research is needed, therefore, that explores empirically the drivers of the variety and the effectiveness of student entrepreneurial ecosystems. In particular, we know little about how these ecosystems emerge and evolve. To what extent are they deliberately designed or emerge organically?

We have also seen that there is some overlap and ambiguity between different aspects of support mechanisms in the student entrepreneurial ecosystem. Research is needed to develop and clarify taxonomies of these support mechanisms.

We have noted that the nature of student entrepreneurship ecosystems may vary between contexts but we lack research on the relationships between supports and context. Are some contexts and supports more effective than others? What support mechanisms are more appropriate in different contexts? We also know little about the life-cycles of these ecosystems and their elements. Given their complexity, research needs to adopt a variety of approaches including longitudinal process-oriented ethnographic research.

Finally, another key element in stimulating a student entrepreneurial ecosystem and holding its elements together concerns how the university conveys the purpose and functioning of the ecosystem. Are university senior managers able to enforce one approach for the university or should they allow decentralization? What are the consequences of different approaches? This suggests that narrative approaches that examine both documentary evidence and how different layers of university management communicate about the ecosystem may be particularly fruitful.

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