



Creating
university-based
entrepreneurial
ecosystems
**evidence from
emerging
world leaders**

MIT Skoltech Initiative

Extended Executive Summary

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1

Introduction

In 2011, Skolkovo Institute of Science and Technology (Skoltech) was established in partnership with MIT with a mission *“to educate global leaders in innovation, advance scientific knowledge and foster new technologies to address critical issues facing Russia and the world”*. A central component of this collaboration is the creation of an entrepreneurial infrastructure and culture within Skoltech that responds to and builds on its regional context.

Embedding entrepreneurship into the university mission and culture in distinctive – and often challenging – environments is an ambition not unique to the MIT Skoltech Initiative. Governments across the world are looking to technology innovation as a driver for national economic growth, and to universities as the incubators of this national capacity. Many universities are therefore seeking to enhance their entrepreneurship and innovation (E&I) capabilities.

Universities operating within established technology hubs, such as Silicon Valley and Kendall Square in the US, offer robust models for success within these environments. In addition, an increasing number of universities located within more challenging environments are establishing strong E&I profiles and reputations, some of whom will undoubtedly become future national and international leaders. From here on, this group will be referred to as the ‘emerging leaders group’ (ELG).

The ELG offers insights for Skoltech and the wider academic community in two important domains:

- how to drive and manage a process of *institutional transformation* towards a more entrepreneurial model;
- how university-based ecosystems can be nurtured in cultural, economic and socio-political *environments that may not be naturally conducive* to E&I.

A phased benchmarking study was commissioned by the MIT Skoltech Initiative to draw on the experiences of the ELG and gain insight into the conditions and strategies associated with successful E&I transformations for universities operating in more challenging environments. In particular, it asked two questions:

- “*which are the world’s most highly-regarded university-based entrepreneurial ecosystems operating outside the established technology hubs?*”, and
- “*what can Skoltech and the international academic community learn from the experiences of these institutions?*”.

As well as supporting the on-going development of Skoltech, the study outputs have been designed to inform the development of university-based ecosystems across the world.

The study, conducted between February 2012 and February 2014, took a qualitative approach, using one-to-one interviews as its primary data source. It adopted a two-stage process:

- **Phase 1:** The first phase of the study sought to identify the world’s most highly-regarded university-based technology driven ecosystems and characterise the approach taken by these top-ranked institutions. It focused both on universities with an established E&I capability as well as on those whose profile was seen to be emerging, often within more challenging environments. The evaluation drew on interviews with 61 thought leaders in the field from 20 countries, each with personal experience of building world-class entrepreneurial ecosystems, and oversight of international best practice in university entrepreneurship. The interviews provided insight into the international landscape for university-based E&I as well as the established and emerging leaders in the field. They also captured information on the range of metrics the experts used to underpin their recommendations and the critical success factors apparent for each top-ranked institution. Expert feedback was complemented by data gathered on each top-ranked university to characterise their E&I approach and performance.
- **Phase 2:** The second phase of the study focused specifically on the ELG, as identified by the expert interviewees in Phase 1. From this list, four highly-regarded universities were selected for detailed case study evaluation: Aalto University (Finland), Imperial College

London (United Kingdom), Tomsk State University of Radioelectronics and Control Systems (Russia) and the University of Auckland (New Zealand). Taken together, they represent entrepreneurial ecosystems that have developed within very different – and often challenging – cultural, economic and political environments over the last 25 years. Case study evaluations focused on the drivers, conditions, change strategies and barriers associated with their E&I transformation. The major data gathering tool for the case study evaluations was site visits to the selected institutions and one-to-one anonymised interviews with multiple ecosystem stakeholders, from both within and outside the university. With between 30 and 35 interviews conducted for each case study, a total of 130 individuals were consulted for this phase of the study.

The two phases of the study are informed by almost 200 interviews with individuals with an in-depth knowledge of some of the world's most highly-regarded university-based E&I ecosystems. As such, the study as a whole paints a unique picture of the opportunities and constraints facing emerging entrepreneurial universities across the world.

This study focused on a group of ELGs, as identified by technology transfer scholars, E&I professionals and thought leaders in the field, to understand the dynamics and context within which these universities have developed their E&I capacity. The institutions selected represent the 'startup phase' in the transition from a traditional university model to an established entrepreneurial university model where the institutional E&I agenda operates as a 'steady-state'. Our hope is to begin to create a dialogue and sharing of best practices and cautionary examples to promote the emergence of vibrant innovation ecosystem across the world.

This document provides a summary of the study findings. It considers in turn: (i) key features of the global landscape for university-based E&I, (ii) key features of the emerging E&I leaders, (iii) models of E&I development amongst the ELG, (iv) conclusions, and (v) a checklist for the development of an entrepreneurial university.

2

Key features of the global landscape for university-based E&I

The benchmarking study pointed to a major global trend towards strengthening entrepreneurial capabilities in universities across the world. Over 200 universities, representing every continent of the world, were identified by experts as demonstrating established or emerging leadership in entrepreneurship.

There was a high degree of consensus about which institutions had created and supported **the world's most successful technology innovation ecosystems**. Three universities in particular – MIT and Stanford University in the US and the University of Cambridge in the UK – were consistently cited as world leaders. The E&I strategies and activities developed by these three universities appear to have been a significant source of inspiration to institutions across the world striving to enhance their entrepreneurial capacity. During the course of the study, impact data and programme information were collected for 20 of the world's most highly-regarded entrepreneurial institutions: almost all had adopted or adapted E&I activities from at least one of these three universities. However, despite this common source of inspiration, many universities seeking to develop their E&I profile appeared to be working in isolation from each other, each struggling to build capacity within their own distinctive environments.

The study also highlighted the **growing strength and impact of the student entrepreneurial movement**, with evidence from both phases of the study suggesting that it had been responsible for some of the most innovative and engaging elements of emerging highly-regarded entrepreneurial ecosystems. Rather than simply emulating successful E&I activities ‘off-the-shelf’ from elsewhere in the world, student-led entrepreneurship activities are increasingly building active partnerships with the regional entrepreneurial community and developing solutions that respond to the challenges and opportunities in the local environment. In contrast to the apparent lack of E&I-based collaborations and cross-institutional support at a university level (as noted above), the student entrepreneurship movement benefits from an increasingly international and connected student network, enabling participants to learn from the “*spectacular successes and spectacular failures of others*”. It was clear that the study was conducted at a time of considerable change, when student-led entrepreneurship is “*bursting out of university campuses all over the world*”. The growth of the student entrepreneurship movement is fuelled by a number of factors, including an appreciation that there is “*no longer a job for life*” for new generations of graduates, the increasing prominence of entrepreneurial role models and the potential for rapidly establishing startups through web-based applications.

Interview feedback also highlighted **concerns about E&I performance metrics**. There is a strongly-held expert view that standard measures work against the university entrepreneurship that they are designed to incentivise and capture. Interviewees from the first phase of the study regarded commonly-used research commercialisation metrics (number of spin-offs, number of patents, licensing revenue, etc.) as unreliable indicators of a university’s long-term capacity to support a vibrant ecosystem. Instead, many experts favoured metrics that captured institutional and cultural drivers for ecosystem growth, for example, indicators that measured the university’s investment in an E&I agenda, levels of participation with entrepreneurship activities across university populations, and the extent of interaction between the university and the entrepreneurial/business community. Indeed, many experts went further in their criticism of current metrics, arguing that their widespread application had distorted university strategy in E&I and diverted attention from critical drivers of growth such as connectivity with the regional, national and international E&I community.



3

Key features of the emerging E&I leaders

Evidence from the expert interviews (Phase 1) and the case study evaluations (Phase 2) pointed to features shared by the ELG, despite differences with respect to their geography, culture and institutional profile. A number of these shared success factors are outlined below.

Well-connected champions: In many cases, the transition towards an E&I focus was propelled by the drive and ambition of two champions within the university; one who inspired and established the vision for change, and one who drove the growth of E&I activities within the institution. The formal role of these individuals varied widely, from a student leader to a university President. However, they shared a common conviction of the importance of entrepreneurship for the university and the region, as well as a set of personal connections with industry and the regional entrepreneurial community that would prove critical to the university's emergence as an entrepreneurial centre, particularly during the 'startup' phase of the institution's E&I development.

In many cases, the individual initially inspiring the E&I transition held a relatively short tenure at the institution. It was the sustained commitment of the second individual – who worked

to build and institutionalise the university's entrepreneurial infrastructure – that was typically critical to embedding the E&I strategy and driving a continued focus on realising these ambitions. Indeed, interviewees consistently described a period of up to ten years where the university's E&I activities were “*almost completely dependent on the networks*” of this second individual, where “*if he left [the university], it would be very difficult for the rest of us to pick up the pieces*”. Beyond this ten-year threshold, many interviewees noted that universities were able to “*institutionalise what we are doing*” by spreading the responsibilities across a broader team.

Public endorsement by senior management: A distinctive feature of the ELG was their prominence in regional and national strategies for economic growth. These strategies recognised the importance of university-supported ecosystems as springboards for economic recovery and/or development, with the university senior management publicly promoting the importance of university engagement with entrepreneurship. It was an emphatic and sustained message that was heard and understood by the university populations (staff and student) and by the wider entrepreneurial community.

Regional, national or government support: A number of the established E&I universities which were highlighted during Phase 1 of the study had benefitted from significant external support for ecosystem development in the form of generous government subsidies and advantageous regional policies. In some cases, experts observed that these interventions allowed universities to present a highly successful façade that could mask an ineffective or very limited E&I contribution by the institutions themselves.

What distinguished the external support offered to the ELG was often its responsive and flexible nature, as well as its sustained presence. This was seen to be critical to the success of many institutions in the ELG, where E&I activities were often described as “*maverick*” in their design and “*explosive*” in their growth, making standard sources of funding hard to access. Interviewees from a number of ELG institutions spoke of a relationship of mutual trust and understanding with funding bodies which, in turn, “*bent a lot of their own rules to fund what we were doing*” and made commitments to continuity of support. Such flexibility allowed financial support to be targeted when and where it was needed, without constraining the direction or growth of the system, a critical feature during the university's ‘startup phase’ of its E&I development. To support this responsive and facilitative approach, the funding agencies were empowered to identify and prioritise high-potential ecosystems and universities in their funding allocations. In addition to resourcing E&I activities and functions, many institutions in the ELG have also used such funding to establish highly beneficial international strategic partnerships with established world-leading E&I universities, experiences that have often helped “*to open their eyes to the possibilities of commercialisation*”. This study does not, however, report on federal policies (such as intellectual property rights, venture formation efficacy, or venture wind-down policies) that can significantly impact regional economic activity by licensing university intellectual property, and/or the creation of new ventures.

Relationships of trust with the regional E&I community: Many amongst the ELG are faced with the dual challenge of both connecting with and unifying the local entrepreneurial community. In many cases, the pre-existing entrepreneurial community was small and highly fragmented, and previous interactions between the university and this group were often marked by

distrust and suspicion. For many in the ELG, “*student energy in entrepreneurship*” was seen to play a critical role in brokering these relationships and energising the local entrepreneurial community, often acting as a conduit between this community and the university itself. Underpinning the interface role of student entrepreneurs is the perception that the student community is “*neutral ground*”, offering a clarity and simplicity of agenda that all parties can relate to. It provides a focal point through which the university and its local entrepreneurial community can come together to “*support the next generation of entrepreneurs*” without “*any suspicion that anyone is coming to this with an ulterior motive*”. As one interviewee observed, “*it stops being about money and starts being about creating something together*”. For universities with a significant alumni network, this group can also play an important role in ‘filling the gaps’ in the local entrepreneurial community.

Mobilisation and drive of the student entrepreneurial movement: At a number of the universities in the ELG, in addition to the community-building role with regional E&I practitioners (as described above), the student population is often responsible for creating and delivering many of the university’s most innovative extra-curricular entrepreneurial support activities and events. The university’s capacity to generate entrepreneurial success is maximised when this student body is informed, mobilised and empowered. Amongst the ELG, these features are often associated with four factors: (i) an existing entrepreneurial experience and networks amongst the student movement leadership, (ii) a direct line of communication between this group and a highly-supportive university senior management, (iii) dedicated low-level funding to support both on-going and new activities, and (iv) a strong sense of dissatisfaction with the *status quo* leading to a shared common purpose amongst the student body.

Interviewees at many institutions in the ELG noted, in particular, the vision, charisma and management quality of the initial leader/s of the university student entrepreneurship movement. These individuals were often seen to set a standard for the ambition and professionalism of E&I activities that was subsequently maintained by successive student leaders, and were repeatedly described as “*the type of students who come along once in a generation*”. In some cases, the drive and vision of the student entrepreneurial movement has played a critical role in triggering the university-wide prioritisation of E&I, as well as shaping its approach to entrepreneurship.

Creating a market for university entrepreneurship: Often with limited existing E&I strengths in their immediate environment, an important priority for many in the ELG was the establishment of a market for the university’s innovative output, at a local, regional and international level. As the case studies make clear, a variety of mechanisms were employed to achieve this goal, such as: (i) creating mutually-beneficial partnership agreements with alumni entrepreneurs, (ii) establishing a dedicated business-facing agency to secure and develop international industry partnerships, or (iii) offering open-access support for entrepreneurial development and startup creation regardless of university affiliation and nationality. Shaped by the regional environment and culture, the content of these strategies for creating new E&I opportunities and partnerships outside the university varied considerably and this adaptability appears to be integral to their success.

4

Models of E&I development amongst the ELG

Taking evidence from Phases 1 and 2 of the study together, it is apparent that universities with a growing E&I reputation tend to conform to one of two development models.

These models are strongly linked to the drivers and triggers for the university's original adoption of an E&I agenda and can be characterised as:

- **Model A: 'bottom-up' and community-led, catalysed by students, alumni and entrepreneurs in the regional economy, with a 'loose IP control'**. Often responding to economic and societal challenges, E&I development is triggered by a desire to stimulate regional/national economic growth, and thereby create graduate jobs, research opportunities and broader avenues for university support through the creation of a vibrant localised entrepreneurial ecosystem. Typically driven by the university grassroots, students and alumni, a dynamic and inclusive ecosystem is created through strong partnerships of trust between the regional entrepreneurial community and the university. The investment is focused on regional rather than institutional capacity; universities often downplay the importance of IP ownership and startup affiliation, regarding

these as secondary to the overarching goal of developing the broader ecosystem. A rapidly growing set of innovative E&I activities often brings high levels of engagement with the entrepreneurial agenda. However, with many activities operating outside the university itself, the model can face difficulties when the university seeks to regulate and institutionalise its entrepreneurship profile. As this suggests, a university can also struggle to manage the organic growth of the E&I capacity and to measure its contribution to the university's standing and impact.

- **Model B: 'top-down' and university-led, working through established university structures, with a 'tight IP control'.** This model is typically triggered by the desire to realise income from university research, with the E&I agenda driven by and focused on a strong and ambitious technology transfer office (TTO) (or equivalent). Often building on established university research strengths, this model offers a robust and fully institutionalised approach. However, its primary focus on university-owned IP often leaves the student and alumni communities marginalised, and relationships with international strategic R&D partners can be prioritised over those with the regional entrepreneurial community. In the years that follow the establishment of such an E&I model, many universities appear to subsequently establish student-led entrepreneurship activities outside and separate from the university's TTO (or equivalent), which actively connect with the regional community. These are seen as a counterweight, a secondary mechanism that will nurture a broader E&I culture within and outside the university.

It should be noted that the study focused specifically on the group of emerging leaders in university E&I that were identified by the Phase 1 experts to have played an active positive role in the establishment and growth of the regional entrepreneurial ecosystem. It could be argued, therefore, that a third development model is also likely to exist for universities whose E&I transformation was seen to be driven by existing national/regional entrepreneurial strength or strategic government investment. Such cases, however, were not the target of this study.

Many in the ELG appeared to show a clear alignment with one of the two models (Model A and Model B), a factor that strongly influenced the resulting E&I priorities and implementation process as well as barriers faced by the university. Key features of the two models are outlined in Table 1. For each, the table summarises (i) the triggers for the university's original E&I engagement, (ii) the function or group which drove the initial E&I transformation, (iii) the key distinguishing features of the early university-based ecosystem, (iv) the E&I performance metrics prioritised within the university, and (v) the key challenges associated with the ecosystem model.

Despite these differences in approach – one driven from the 'bottom-up' and one taking a 'top-down' strategy – both models share a common barrier to long-term success, namely the very limited levels of engagement with entrepreneurship by academic departments. Indeed, both models require limited faculty engagement for their growth and operation; almost all E&I activities are offered by student/community groups (Model A) or university support functions (Model B). As such, they operate in parallel with, rather than being integrated into, the core university functions. In consequence, many institutions in the ELG identified faculty culture as the major barrier to their further growth as entrepreneurial centres.

	Model A	Model B
Initially triggered by...	Regional/national economic constraints, leading to a desire to position the university at the centre of a programme of regional capacity development, job creation and, ultimately, economic growth.	A desire to “realise income from university research” and increase university revenues.
Initial E&I drive often led by...	A grassroots movement, often driven by students and alumni in partnership with the regional entrepreneurial community.	A strong and successful technology transfer office (TTO) (or equivalent) typically with a clear preference for licences over startups.
Strategic priorities	The development of the regional entrepreneurial ecosystem, typically focused on technology-based startups, regardless of university affiliation or IP ownership.	To create national and international impact and revenue from the institution’s translational research output. Tight control is exerted over university-owned IP, with a primary focus on inventive research output.
Key features of the emerging ecosystem	Entrepreneurial activities are highly integrated into the regional entrepreneurship community, often acting as a catalyst to bring this community together. The entrepreneurial activities often take root at speed and appear to be associated with significant levels of engagement, trust and collegiality both outside and within the university. A diverse range of E&I activities is developed, often both innovative and led by students or the E&I community, ranging from low-entry networking opportunities, to E&I development courses/ experiences, to one-to-one startup support. This model appears to be more strongly associated with external, often government-linked, funding to support E&I activities.	The university often has established research strengths and growing capabilities in multi-disciplinary applied research with an explicit emphasis on societal and industry benefit. With national research funding increasingly linked to ‘impact’, such translational research activities are the focus of increasing attention. Almost all E&I activity is associated with the TTO (or equivalent) and the approach developed offers a stable and robust set of E&I processes which provides a strong platform for the university to access international markets. These processes are well-understood and disseminated within the university and are not dependent on the priorities of individual university leaders or “the ups and downs of university life”.
E&I performance metrics employed	Anticipated long-term success metrics include regional employment opportunities, graduate E&I skill base and employability, growth in regional startups and (ultimately) regional economic growth. The universities, however, find short-term success metrics more difficult to identify or measure.	Institutional E&I success metrics are typically focused on licensing revenue and industry-funded research. TTOs will also closely monitor numbers of invention disclosures, patents, startups and licences.
Challenges associated with the ecosystem model	Challenges focus on the extent to which the E&I activities are embedded into the institutional fabric rather than being dependent on the drive and networks of a few charismatic individuals. In consequence, many such universities have invested time and resources in establishing parallel E&I activities within the university itself, to complement the student- or community-led activities. The organic nature of the growth of this E&I model also makes its progress difficult to predict or manage.	The university, believing E&I to be an established strength of the institution, often does not see the need to develop additional entrepreneurial capabilities outside those supported by the TTO (or equivalent). As a result, the university’s E&I policies become “synonymous” with those of the TTO, leading to a culture where “only university-protected IP is seen as worthwhile”. Such a model risks marginalising student- and alumni-driven entrepreneurship, and integration with the regional entrepreneurial community is often very limited.

Table 1. Overview of the two development models associated with the initial establishment of an E&I agenda amongst the ELG.

How a cultural change might be achieved, and, indeed, whether it is appropriate to “*distract*” faculty from their “*core duties of teaching and research*” is the subject of major debate within these institutions. As of early 2014, most institutions had taken few explicit steps to foster a stronger E&I culture within departments. So, for example, a university’s entrepreneurial ambitions and profile are rarely reflected in the curriculum; in large part, the educational content and delivery remains fairly traditional. Similarly, there is little explicit encouragement to consider and harness commercialisation opportunities in the early stages of research; commercialisation is almost always seen as a beneficial by-product for a very small proportion of research rather than a mainstream driver for it. In addition, despite explicit senior management endorsement and often a high visibility of E&I on campus, university promotions procedures and budgeting priorities typically remain unchanged. Indeed, amongst many institutions in the ELG, there has been a keen appreciation of the challenges of moving E&I from the margins – the TTO or E&I support functions – to the centre of the university – the research and teaching functions.

Such issues have been the subject of considerable debate and “*soul searching*” by senior university management amongst the ELG universities; particular thought has been given to the question of whether entrepreneurship should be written into the university’s mission. In this context, many university senior managers acknowledged the potential conflict between research excellence, as measured by international university rankings, and entrepreneurial ambitions. Such discussions are on-going in many of the universities considered in this study.

5

Conclusions

The study has turned a spotlight on some of the world's most highly-regarded university-based entrepreneurial ecosystems. Its aim has been to highlight key strategies and features associated with well-regarded university E&I transformations within more challenging environments, as well as the barriers and challenges faced by the ELG, in order to provide inspiration and support to other universities wishing to make similar changes.

The study has pointed to a number of factors that support the development of university E&I capabilities and ecosystem growth. These components centre around five groups or functions that play a critical role in nurturing and growing this capacity: university senior management, university departments, university-led E&I functions, student-led entrepreneurship activities and the external E&I community. Structured within these five groups, Figure 1 illustrates the distinguishing building blocks of an effective university E&I approach, as implied by the study findings.

Evidence from the ELG suggests that synergies between the features highlighted in Figure 1 provide the foundations for the establishment of institutional entrepreneurial cultures and capabilities. The combination and emphasis of each of these features varies between the two models of university entrepreneurial growth amongst the ELG – 'top-down' and 'bottom-up'. The challenges faced by the two models, however, are shared; they both struggle with two common barriers to change. The two challenges – (i) a disconnect between grassroots, community-driven E&I and formal university channels for research commercialisation, and (ii) the integration of E&I into the university's mission, policies and incentive systems – are outlined below.

If not addressed, these two challenges have the potential to constrain the growth and institutionalisation of E&I within this group of universities. However, universities can exert considerable traction on both challenges; they are able to make significant progress at the institutional level in each domain without wider changes in the national or regional environment for higher education or E&I.

The **first challenge** relates to the disconnect between the two key mechanisms that appear to be driving entrepreneurial growth:

- the grass-roots community-led effort to build E&I engagement and strengthen the regional entrepreneurial skills base, labelled Component 1 in Figure 2;
- the university-led effort to drive corporate engagement and commercialise university-owned innovations, labelled Component 2 in Figure 2.

Evidence from the study suggests that universities in the ELG tend to establish their E&I focus through one of these routes, leaving it imbalanced during its early development. In addition, where, and if, the second domain is added, there is often a considerable tension at their interface and the two domains often operate in relative independence from one another.

1.	University senior management: Strong university leadership and governance, actively promoting a clear and prominent E&I agenda that is responsive to the regional and national entrepreneurial environment.
2.	University departments: An academic culture that acknowledges, supports and rewards E&I enquiry within a cross-disciplinary context, helping to nurture influential disciplinary-based role models, curricular and co-curricular activities, and champions for institutional change.
3.	University-led E&I activity: Distributed responsibility for E&I delivery across multiple university agencies, with a range of support services and participation routes for both students and staff throughout each stage of their personal entrepreneurial growth.
4.	Student-led E&I activity: An empowered, cohesive, inventive, bold and well-connected student-led entrepreneurial community, benefitting from sustained low-level funding, seasoned entrepreneurial mentors and direct connections to university senior management.
5.	External E&I community: Robust relationships built on trust and mutual benefit between the university and the regional/national E&I community, with a platform for these individuals to play a visible and influential role in university life.

Figure 1. Distinguishing building blocks of university E&I strength.

For example, a faculty member interested in the commercial potential of their field of research is rarely encouraged to interact informally with relevant experts from the regional ecosystem. Similarly, participants in grassroots E&I activities are rarely given the opportunity to learn from university research commercialisation or benefit from the national and international networks accessed through the TTO office. In other words, the division between university-owned IP and non-university IP casts a long shadow. This division is further reinforced by E&I performance metrics currently employed by most universities that focus predominantly on the exploitation of university-owned IP.

The benchmarking study indicates that an entrepreneurial university is one that supports and integrates both these domains, with the performance of an effective and vibrant ecosystem being greater than the sum of these parts. At an institutional level, integrating these two domains comes down to strong leadership and governance structures that facilitate E&I. Beyond the university, there is an important role to be played by governments at national and international level in actively promoting the economic contribution of universities and in supporting the development and application of appropriate metrics that reflect both domains of an entrepreneurial university.

The **second challenge** is perhaps more deep-rooted and relates to the issue of embedding E&I into the vision and mission of a university, indicated as Component 3 in Figure 2. While not inherently in conflict, entrepreneurship at many universities in the ELG has yet to be aligned with the core university functions of teaching and research. Despite vocal commitment to the E&I agenda by university leadership and a suite of high-profile and engaging entrepreneurship activities offered by various support functions, interviewees frequently reported that *“entrepreneurship is virtually invisible”* in university departments. Instead, *“the [university’s] entrepreneurial outlook has not seeped into the academics’ priorities or had an effect on the curriculum”*. For many, *“the incentives built into the university”* were the root causes of the problem, which, in almost every case, remained *“the same as any research university”*, and had not been adapted to reflect the university’s transition to an entrepreneurial institution.



Figure 2. Three components that appear to be critical to the establishment of an entrepreneurial university.

Although it will clearly take many years for an entrepreneurial culture to take root in academic departments, interviewees consistently identified the incentive structures around which departments were organised as “*stagnating*” the university’s entrepreneurial growth. In the globalised market in which universities operate, research income and research rankings are the metrics that count, goals seen by some to “*directly conflict*” with an entrepreneurial agenda. Indeed, senior managers at many of the ELG universities spoke of how pressures to improve the university’s research performance had grown in parallel with the university’s developing entrepreneurial ambitions – and the tensions between the two were “*considerable*”. In consequence, most have not “*taken the risk*” of implementing formal mechanisms to incentivise and celebrate entrepreneurship within the university, such as changes to promotions procedures, budgetary allocations or curriculum design, for fear of compromising their research performance and “*slipping down the league tables*”. Some interviewees suggested that many of the established leading entrepreneurial universities, such as Stanford University or MIT, had put the foundations in place at a time when the risk and opportunity costs of investing in ecosystem growth and university-led E&I activity were seen to be significantly lower than they are today. Even amongst these institutions, however, many interviewees reported that the diffusion of an entrepreneurial faculty culture, beyond well-recognised champions, remained “*a significant challenge*”.

As this suggests, if university-based entrepreneurial growth is a priority, university performance metrics need to be revised to reflect this. Identifying appropriate institutional E&I metrics is clearly challenging; they need to both catalogue E&I activity and incentivise activities that will generate a future return on investment (ROI) for the institution, both with respect to income and reputation (e.g. via the international rankings). Widely accepted measures of university E&I (research-related invention disclosures, patents, number of spin-offs, licensing revenue etc.) are relatively easy to capture. However, as this benchmarking study has highlighted, such established metrics only reflect one dimension of institutional E&I capacity – typically the immediate output from its TTO and corporate research functions (represented by Component 2 in Figure 2). Metrics that capture the university’s institutionalisation of and commitment to E&I (Component 3) as well as its E&I culture, connectivity and influence on the regional and national entrepreneurial community (Component 1) are rarely considered. However, the benchmarking study suggests that it is these wider infrastructural features that are driving E&I capacity in the ELG and are likely to be vital to a university’s long-term capacity to create and support E&I. As the experts consulted in Phase 1 made clear, additional metrics are required to shift the characterisation of a ‘successful entrepreneurial university’ away from those who have “*got lucky*” with one or two successful research commercialisation “*blockbusters*”, and towards those institutions with an E&I commitment, culture and capacity that will enable sustained regional and national entrepreneurial growth.

6

Entrepreneurial university checklist

Taken together, the study findings summarised in Section 5 – the distinguishing building blocks for success amongst the ELG (Figure 1) and the on-going challenges often faced by these institutions – provide a checklist for institutions wishing to develop their entrepreneurial capabilities. Figure 3 presents this checklist. It does not represent an exhaustive list of the components of an effective entrepreneurial university, a task beyond the remit and resources of this benchmarking study.¹ Instead, the checklist highlights features that mark out potential E&I leaders of the future from their contemporaries and which, additionally, can be directly influenced by an institution.² The emphasis of each factor within the five mutually-supportive components in Figure 3 will vary between institutions, but all are associated with the ELG universities, blending the success factors and challenges faced by this group.

¹ For a broader, system-wide assessment, see, for example, the OECD *Guiding Framework for Entrepreneurial Universities*, available at <http://www.oecd.org/site/cfecpr/guiding-framework.htm>

² It should be noted that the checklist does not provide a template for priorities and strategies associated with effective TTOs. As the case studies make clear, such strategies vary by institutional and regional context as well as the university drivers for its E&I transformation.

1. Leadership and institutional governance
Clear, well-articulated and unified university E&I strategy, which brings together priorities, activities and outputs related to both university-owned IP and non university-owned IP
Visibility of E&I in the university mission statement, with the vision vocally and publicly endorsed by senior university management and governing body of the institution
Clear performance metrics for university E&I that incorporate institutional E&I culture, connectivity and engagement as well as commercialisation and industry-funded research output
An approach that is responsive to changing institutional conditions and opportunities for E&I, based on a knowledge of the external E&I environment, on-going university E&I impact assessments and an awareness of international research and progress in the field
Provision of flexible, responsive and on-going funding streams to support E&I activities, resourced from internal budgets and/or brokered from agencies external to the university
2. Academic cultures and careers
Visibility of E&I in departmental and faculty activities, workload models, role allocations and performance targets
Recognition of E&I impact, experience and connectivity in the recruitment and promotion of faculty, researchers and teachers; a fact publicly promoted and endorsed by senior academic staff
Visibility of faculty role models and champions in E&I, celebrating both their successes and failures
Mechanisms to promote research collaboration, enquiry driven by end-user need and multi-disciplinary E&I across and beyond the university
3. University-led E&I activity
Distributed responsibility for delivery of the university E&I agenda, across several autonomous agencies, led by individuals with networks and experience within the E&I community
Range of university-led E&I activities, which can be accessed by staff and students via multiple routes, supporting each stage of an individual's entrepreneurial development, from early awareness-raising to accessing financing for commercialisation
Inclusion of E&I in the curriculum, exposing students to entrepreneurial ideas, projects, role models and opportunities from within their field of study
Formal E&I training for university faculty and researchers as part of their continuing professional development
Dedicated mentorship for student and staff startups, with particular focus on skill-building and the creation of well-balanced startup teams with insight into market need and access
4. Student-led and grassroots E&I activity
Empowered, cohesive and bold student-led entrepreneurship activity that is: <ul style="list-style-type: none"> • well-connected to and working in partnership with the regional E&I community, acting as a conduit between this community and the university, where necessary • informed and well-connected to the national/international student entrepreneurship community • autonomous in its direction and focus • supported by a highly-supportive point of contact within university senior management • led by students with personal experience of and networks in entrepreneurship • fresh and innovative in its thinking, supporting renewal and responsive to changing regional conditions, institutional environment and student needs
5. Connectivity with and support for the regional, national and international E&I community
Partnerships based on trust and mutual benefit with government, industry, alumni entrepreneurs and the regional/national E&I community, with a common understanding of the university's regional E&I role
Connectivity with the international academic E&I community, with strategic alliances, where appropriate, with established internationally-leading E&I universities
Range of mechanisms for members of the regional/national E&I community to support university-based E&I talent and ideas, allowing these individuals to play a visible and influential role in university life
Range of mechanisms – both within and beyond disciplinary departments – by which students, staff and alumni can access, network and collaborate with the regional, national and international E&I community

Figure 3. Checklist of the distinctive features of an effective entrepreneurial university that can be directly influenced by the institution, as identified during the benchmarking study.

