Graduate entrepreneurship incubation environments

A framework of key success factors

Haya Al-Dajani, Evangelos Dedoussis, Erika Watson and Nikolaos Tzokas

Abstract: The benchmarking framework developed in this study is specifically designed for higher education institutions to consider when developing environments to encourage entrepreneurship among their students, graduates and staff. The objective of the study was to identify key success factors of Graduate Entrepreneurship Incubator Environments (GEIEs) that nurture, encourage and promote entrepreneurship in higher education. Semi-structured interviews with stakeholders in five leading UK entrepreneurial universities were used to collect data on GEIEs. The framework is a non-prescriptive tool which can be used by universities as a practical mechanism for plotting and monitoring progress towards an enabling environment for entrepreneurial graduates.

Keywords: graduate entrepreneurship; graduate incubators; entrepreneurial universities

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The foundations of entrepreneurship as an academic discipline can be traced to influential works by Schumpeter, Drucker and others. Alongside these works and starting in the late 1940s through to the 1950s, the first MBA programmes on new enterprises, entrepreneurship and related fields, as well as MBAs focusing on entrepreneurship, were developed at prestigious American universities, soon to be followed by many other institutions (Katz, 2003). The proliferation of courses, concentrations, majors and degrees in entrepreneurship that originated in the USA was subsequently matched by a massive worldwide expansion of similar offerings in universities around the world. Currently almost all business schools offer a course or module in entrepreneurship. An indication of the interest in entrepreneurship as an academic discipline is the fact that in the USA alone the number of schools offering courses in the area increased from less than 100 to more than 2,000 between 1977 and 2013 (Faley and Adriaens, 2013).

It was not long before such courses and other offerings in entrepreneurship became supported by...
institutions to be proactive, and substantial pressure on uncertainty and complexity, growing demands upon increasing globalization and the ensuing greater act ‘entrepreneurially’ (Gibb, 2010) in the context of universities are effectively left with little choice but to not to jump onto the business incubator bandwagon, graduates. Though arguably free to choose whether or offer to their institutions, their students, staff and incubators and partnerships with the private sector could employability and policy benefits that business incubators. Although the concept of business incubation was first introduced in 1959 (Ibata-Arens, 2011) there is still no universal agreement on its definition. While the element of physical space is emphasized in an elementary definition as ‘the place where start-up enterprises are concentrated in a restricted space’ (Tzafestas, 2008, p 549), the dynamic process of business enterprise development is given prominence in the more elaborate definition used by the American National Business Incubation Association (NBIA, 2014). According to the NBIA, business incubation is

‘a business support process that accelerates the successful development of start-ups by providing entrepreneurs with an array of targeted resources and services that are usually developed or orchestrated by incubator management and offered both in the business incubator and through its network of contacts . . . The incubator graduates have the potential to create jobs, revitalize neighborhoods, commercialize new technologies, and strengthen local and national economies.’ (NBIA, 2014)

Required capital may be provided through links with business angels or in the form of seed capital, while operational know-how and opportunities for accessing new markets may be added advantages of incubators (Aernoudt, 2004).

First established in the 1950s, business incubators spread quickly. For example, in the USA there were only 12 in 1980 but there were 1,250 in 2012 (Clark, 2013). Worldwide, it is estimated that around 7,000 business incubators exist, including 1,500 in developing countries (Voisey et al, 2013). Business incubators and networks of incubators are, it seems, currently found in almost every industrialized and developing country (Lalkaka, 2003; Tzafestas, 2008; Ibata-Arens, 2011).

Universities – and in particular the entrepreneurial ones – soon realized the commercial, educational, employability and policy benefits that business incubators and partnerships with the private sector could offer to their institutions, their students, staff and graduates. Though arguably free to choose whether or not to jump onto the business incubator bandwagon, universities are effectively left with little choice but to act ‘entrepreneurially’ (Gibb, 2010) in the context of increasing globalization and the ensuing greater uncertainty and complexity, growing demands upon institutions to be proactive, and substantial pressure on the higher education sector to align itself with market forces and changing priorities.

The establishment and proliferation of business incubators in universities has been influenced by two further factors. First, there is the socially explosive issue of employability, especially among university graduates (Bardsley, 2010; Doward, 2012) because, ironically, rising education levels have been accompanied by rising levels of unemployment, resulting in a growing mismatch between the number of available jobs and the supply of university graduates. The second factor is the conscious choice by a significant number of graduates of self-employment as a career option (Dawson et al, 2009; Majogoro and Mgbbo, 2012).

Worldwide, business incubators have become a feature of many universities, prestigious and otherwise. The continuing rush to establish business incubators in universities is underlined by the transformation of university–industry linkages from a linear to an interactive innovation model, together with the evolution of the incubator from an isolated to a networked entity (Etzkowitz, 2002). Notwithstanding occasional voices cautioning on the proper place, use, function and role of incubators and their relation to and integration with business and entrepreneurship curricula (Faley and Adriaens, 2013; Colao, 2012), the pace of establishing business incubators at universities remains unabated.

Higher education and entrepreneurship

A university degree or qualification is widely regarded, in many parts of the world, as a passport to employment opportunities, especially in white collar occupations. Moreover, highly skilled self-employment and entrepreneurship in high-growth sectors also often requires advanced skills and university qualifications.

Indeed, it is generally accepted that there is a positive link between entrepreneurial activity and level of education, because the rate of the former rises with increases in the latter (Raposo and do Paco, 2011) although, in some cases, such a conclusion can only be drawn after controlling for correlated factors such as ethnicity and race (Packham et al, 2010; Fairlie, 2012). Crucially, performance on entrepreneurial ventures undertaken is significantly and positively associated with education (van der Sluis et al 2008), notwithstanding the view that education is not particularly important with regard to the likelihood of being a nascent entrepreneur (Mueller, 2006). Botham and Mason (2007) found that 14% of graduates become entrepreneurs, eleven years after graduation, because they acquire capital, skills, contacts and market intelligence during that period, to resource their
start-ups. Increasingly, however, graduates are starting their entrepreneurial ventures much earlier, and closer to graduation from university. The NCGE (2007) found that 4% of university graduates started their entrepreneurial ventures upon graduation and this percentage is increasing due to a combination of factors including the current global levels of unemployment, changes in graduates’ expectations and lack of satisfaction with employment, and the availability of funding and financial support and other start-up support services for graduates.

The positive relationship between higher education and entrepreneurship becomes even more pronounced when latent entrepreneurial intentions are considered, because between one third and one half of students indicated their intention to start their own business at some stage (Greene and Saridakis, 2007), with 61% of students expressing a preference for self-employment compared to 45% in the general population (ibid). However, it should be noted that data on entrepreneurial intentions mask a significant gender gap: despite higher declared intentions among women to pursue self-employment (Majogoro and Mgabo, 2012), the average rate of actual entrepreneurial activity for men is more than 50% higher than that for women (Fairlie, 2012). A host of social and motivational factors as well as personality characteristics emphasize differences in entrepreneurial intentions and activity among different age, race, education, nativity and gender groups (Bhandari, 2006; Mueller, 2006; Dawson et al, 2009).

As it has been remarked, ‘...there appears to be a significant gap between finding self-employment or entrepreneurship attractive and having the desire and self-efficacy to carry it through to positive action’ (ISBAC, 2004, p 36).

Quite surprisingly – and even counter-intuitively, given factors typically associated with business schools such as entrepreneurship education, support facilities and programmes, cultivation of a ‘business’ mentality, and industry ties, that are expected to increase entrepreneurial intentions (Walter et al, 2013) – entrepreneurship is not the exclusive destination of business school students, because they, and their counterparts in science, engineering and technology are under-represented in graduate entrepreneurship: student entrepreneurs are more likely to come from arts and humanities disciplines (Greene and Saridakis, 2007). Irrespective, however, of the particular field of study, the ‘university community’ was considered an important factor of business support by 75% of graduate entrepreneurs compared to just 5% for non-graduate entrepreneurs (Al Dajani, 2009; Voisey et al, 2013). This suggests that, first, the university is an important hub of support for graduate entrepreneurs; and, second, that there is a need for distinctive graduate enterprise services.

**Graduate entrepreneurship in the UK**

Major changes have recently occurred in UK higher education, including substantial cuts to university funding, steep increases in tuition fees payable by graduates (generally funded by means of low-interest, long-term personal loans) in conjunction with proposals to slash the cost of higher education and universities being required to publish statements about their employability activities and services offered to ensure that students are hired upon graduation. These changes have taken place amid concern about rising levels of unemployment – highlighted by the claim that more than 70 university graduates compete for every job available in the country, with the mismatch between demand and supply being much worse in some sectors for new graduates (Clark, 2012). Recent slight improvements notwithstanding (High Fliers, 2013) graduates are faced with the toughest job market conditions since the start in 2008 of the global financial crisis (Peacock, 2013).

At the level of economic policy, the UK government adopted productivity growth measures focusing on the drivers of productivity including investment, innovation, skills, enterprise and competition, with the expectation that the drivers and synergies among them would boost productivity. Priorities on innovation and skills set by Regional Development Agencies (RDAs) helped implement the broader national policy, although this is expected to be influenced by the Local Enterprise Partnerships which replaced the RDAs in England in 2012. The development of graduate enterprise, supported by substantial public funds and the establishment of the National Council for Graduate Enterprise (NCGE), aligns well with the broader economic strategy because it combines the drivers of innovation, skills and enterprise.

The changes in higher education in the UK outlined above reflect the rapidly growing research and policy view that in the emerging ‘enterprise university’ (Marginson and Considine, 2000) the development of entrepreneurial capabilities, firmly grounded in ‘enterprise education’ which emphasizes entrepreneurship education and cultivates a graduate enterprise incubation environment, must complement the development of intellectual, technical and professional skills, the focus of traditional university education. While there is ongoing debate on whether ‘enterprise education’ is theoretical ‘learning about’ or experiential ‘learning for’ (Botham and Mason, 2007; Hermann, 2008) it can be argued that the two need not...
be mutually exclusive and that the focus should be on the desired outcomes such as those outlined by the Entrepreneurial Learning Outcomes Framework (NCGE, 2007). The NCGE (2007) framework includes eight points: entrepreneurial behaviour; attitude and skills’ development; creating empathy with the entrepreneurial life-world; key entrepreneurial values; motivation to pursue an entrepreneurship career; understanding of the process of business entry and tasks; generic entrepreneurship competencies – day-to-day minimum business ‘how-to’s; and managing relationships.

Several reports by the National Endowment for Science, Technology and the Arts (NESTA), the National Council for Graduate Entrepreneurship (NCGE), the Council for Industry and Higher Education (CIHE) and the Institute for Small Business and Entrepreneurship (ISBE) have urged UK universities to ‘institute a systematic overhaul of academic disciplines so that entrepreneurship education is embedded in every subject’ [emphasis added] (Hermann, 2008, p 6) and that ‘action needs to be taken to scale up and embed enterprise and entrepreneurship education to reach all students’ [emphasis added] (Rae et al, 2010, p 3). Such unambiguous language regarding the place of entrepreneurship in the modern education system reflects the prevailing views in the European Union (Voisey et al, 2013) and is in line with the findings of mapping reviews of enterprise and entrepreneurship education across 127 HEIs, suggesting progress in several areas including technology transfer and commercialization support, student engagement and gender balance, supportive infrastructure, in-curricular provision, extra-curricular activities and new venture creation (Rae et al, 2010).

**Graduate enterprise incubation environments**

The term ‘graduate enterprise incubation environments’ (GEIEs) is defined in this paper as the physical or virtual environments that support the development of new venture creation and/or entrepreneurial skills among students and graduates. A GEIE is a focused process of support and development and is likely to include:

- Serviced workspace with specific entry criteria and time limits provided at below-market rates;
- Entrepreneurial learning, business development and/or technical support with in-curricular and/or extra-curricular training, mentoring and introduction to external networks and experts; and
- Forums for peer-to-peer support and synergy between nascent and existing entrepreneurs.

Like business incubators, the various elements of a GEIE come together as more than the sum of their parts, creating a dynamic environment in which new enterprises can flourish and grow. The context of the ‘university community’ and, more broadly, that of the ‘entrepreneurial university’ (Gibb, 2010), together with effective communication channels, are crucial in creating a long-term strategic approach and a supply pipeline of students and graduates into the GEIE – and out of it, into the business world. Amid the current financial crisis affecting one third of Euro-zone countries, the prospect remains of a ‘jobless’ recovery given that creation of employment is expected to lag far behind economic recovery, that forecasts are for sluggish growth in the European Union and that levels of youth unemployment remain persistently high. The imperatives that led to the establishment of most GEIEs in the UK before the onset of the current crisis currently remain as relevant as ever.

**Significance of the study and research aim**

The UK and the USA are the two leading countries in the establishment of business incubators in industry and universities. As such, the UK experience with GEIEs can offer valuable insights and lessons and provide a blueprint for developing countries anxious to promote entrepreneurship in order to spark economic development through the creation of a dynamic and competitive tertiary education sector (Nabi and Holden, 2008). The aim of this present research therefore was to identify the key success factors of GEIEs in UK universities, to inform best practice elsewhere. Two objectives will be addressed in pursuing this aim.

- To provide a review of best practices in five UK entrepreneurial universities.
- To develop and apply a benchmarking framework for GEIEs in UK universities.

Participating universities were restricted to higher education institutions (HEIs) with physical GEIE facilities (as opposed to virtual facilities) which were our point of contact and entry to each of the five participating universities. By placing the GEIEs at the centre of the research, as opposed to the institutional or policy perspectives usually adopted in similar studies, our alternative view has enabled us to offer fresh insights and thus working as an advantage rather than a limitation.

It is noted and acknowledged that the study was limited by the dearth of statistical data kept by
universities with regard to the enterprise activities about their clients. This was both frustrating and a matter of concern, notwithstanding the presence of some emerging pockets of good practice.

Methodology
The GEIEs benchmarking framework developed and used in this study was informed by a review of international and UK practice and includes the following benchmark elements.

- **Graduate enterprise services**: such services are at the core of GEIEs while other elements are required for optimal development.
- **Leadership and institutional culture**: this refers to the sustained commitment of and synergies between key players within the university.
- **Strategic drivers**: help provide effective planning, resources and capabilities.
- **Communications**: helps create essential support, promotion and information networks around the services.

The framework was applied to five leading UK entrepreneurial universities where information was collected through individual semi-structured interviews with experts and internal and external stakeholders. At each university, various key staff were interviewed individually: in addition, whenever possible, interviews were also conducted with graduate entrepreneurs who had benefited from the university’s support. Using a series of open questions and observations enabled further iteration of the benchmarking framework which was refined and completed following the data collection. The following criteria were applied in selecting the universities that participated in the study.

- Universities identified as particularly entrepreneurial in major reviews.
- Universities with physical GEIE facilities.
- Customer-focused website reviews.
- Availability of key staff during the on-site visits and a good level of cooperation.
- Two universities to be selected from the Russell Group (which represents the 24 leading universities in the UK).

In order to ensure confidentiality and anonymity as far as possible, the participating universities are referred to as university A, B, C, D and E in this paper.

Findings
Relevant data obtained from the five participating universities are presented with regard to each of the four dimensions of the GEIE framework: graduate enterprise services; leadership and institutional culture; strategic drivers; and communications. Figure 1 illustrates the existing relationship and impact between these four dimensions; dashed rather than solid lines are used in Figure 1 to indicate the inter-relatedness and inter-dependence between the four dimensions. We regard graduate enterprise services as the core, with optimal development requiring the other three dimensions to be placed surrounding these services. That is:

- **Communications**, which create essential support, promotion and information networks around the services;
- **Strategic drivers**, which provide effective planning, resources and capabilities; and
- **Leadership and culture**, the sustained commitment of and synergies between key players in the university.

The thematic qualitative analysis revealed 21 benchmark indicators, spread across the four dimensions of the GEIE framework as shown in Figure 2. As in Figure 1, dashed rather than solid lines are used in Figure 2 to demonstrate the inter-relatedness and inter-dependence of the identified indicators.

The results obtained for each of the four dimensions of the GEIE framework and the relevant indicators as outlined in Figure 2 are as follows.

**Graduate enterprise services**
*Workspace/hatchery.* Physical incubation environments are a key part of this study. All five of the participating universities had physical incubation space, ranging from ten to one hundred desks. Services typically included the following:

- Wi-Fi and networked PCs;
Free broadband, photocopying, tea/coffee, and kitchen facilities;
- Telephone line rental;
- Advice on starting an enterprise;
- Business surgeries covering finance, marketing, intellectual property, taxation, legislation, funding and other topics;
- Help with business planning;
- Meeting rooms and networking area;
- Virtual incubation including use of meeting rooms and the incubator address for business purposes; and
- Support staff located close to the hatchery and ‘on call’ for advice and support.

All hatcheries were open-plan and located in buildings near the universities. These buildings often housed other

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**Table 1.** Identified benchmark indicators.

<table>
<thead>
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<th>Graduate enterprise services</th>
<th>Communications</th>
<th>Strategic drivers</th>
<th>Leadership and culture</th>
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<td>Hatchery/ workspace</td>
<td>Internal communications</td>
<td>Strategic action plans</td>
<td>Senior leadership commitment</td>
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<td>Extra-curricula activities</td>
<td>Marketing and promotion of graduate enterprise activities</td>
<td>Alignment with regional and local economic development and industry</td>
<td>Internal partnership: academic, careers, REE, Business School</td>
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<td>Links to external networks</td>
<td>Dynamic web-based graduate enterprise information resources</td>
<td>Staff capacity building</td>
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<td>Enterprise and entrepreneurship within the curriculum</td>
<td>University-level peer networking</td>
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<td>Commercialization</td>
<td>Sustainability of enterprise activities</td>
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<td>Real world experience</td>
<td>Reputation as an enterprising university</td>
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Figure 2. Identified benchmark indicators.
university business spin-outs and support services and were perceived as business rather than academic focused. In some of the facilities potential tenants had to apply for membership and demonstrate that they were serious about developing a business plan and/or exploring ideas. Most facilities were open to pre-start and start-up businesses including current students and graduates who, in the case of the latter, might be from another HEI. It should be noted that the GEIE at University E accepted non-graduates who demonstrated an exceptional business concept, while the technology-focused GEIE at University A concentrated on contracting and freelancing and some of its members were referrals from adult redundancy programmes.

Extra-curricular activities. Complementing and extending curriculum-based offerings, each of the participating universities provided wide-ranging and coherent programmes of extra-curricular activities that typically included:

- Regular start-up workshops;
- Individual business advice;
- Summer school/Boot camp (often in partnership with other HEIs);
- Business plan or ideas competition;
- Small grants; and
- Enterprise events with external speakers.

In some universities, an ‘entrepreneur in residence’ was engaged to inspire and guide students and recent graduates in developing their entrepreneurial skills and capabilities. Similarly, enterprise champions were also engaged, to promote and support enterprise activities across the institution. At University E, weekly academic enterprise seminars on search engine optimization, industrial collaboration and other related topics, featuring top class speakers, were offered free of charge to academic staff. Project funded initiatives were also found within faculties. For example, the Management School at University B was awarded €1.1 million to help students in five countries to transform energy innovation ideas into new business start-ups.

Links to external networks. All participating universities focused on integrating external networks, small and medium size enterprises (SMEs) and other organizations into their student and graduate enterprise provision. For instance, the GEIE at University C worked closely with more than 60 SMEs that provided voluntary mentoring to students on entrepreneurship modules – private sector support for the GEIE by means of pro bono business surgeries covering several functional areas. A consultant, who acted as a key link with the local business community, recruited mentors and signposted venture members to other sources of help, was also employed by the same university.

Enterprise and entrepreneurship within the curriculum. A limited number of accredited entrepreneurship modules was available at Universities A and B. Entrepreneurship programmes at University C were open to first year undergraduates in all courses and enrolment in these modules was around 1,600 students per year while, at the request of other faculties, the university’s GEIE developed cross-faculty enterprise programmes.

With the support of its centre for entrepreneurial learning, acting as adviser and critical friend, a new joint honours entrepreneurship degree was launched at University D. All 1,100 students in the Business School of University D were required to take the compulsory entrepreneurship module.

Faculty at the Business School in University E received an award for designing a new undergraduate module aimed at developing the entrepreneurial mindset and skills of students across the university. This innovative module, first piloted in 2008/09, was subsequently broadened to make enterprise an option for almost every degree in the Business School, allowing business students to produce a business plan in the second year of studies, to be followed by the launch of a real business at the university GEIE in the students’ final year. The module, now available to any student across the university, was designed such that 80% was based on generic transferable skills that nurture entrepreneurial thinking and creativity and 20% was localized and specific to the student’s major degree – languages, computing, physiotherapy, or whatever.

The experiences of University E and University C reflect the growth in entrepreneurship education in HEIs underscored by the emerging view that enterprise should not be just a course that students choose to study but rather an approach integral to all higher education courses. Along similar lines the expert report co-published by NESTA, NCGE and CIHE noted that ‘There is an emerging consensus across Europe that entrepreneurship education must stretch beyond a narrow focus on business start-up to equip young people with the personal skills, attributes and behaviors that focus on creativity, initiative, self-confidence and practical experience’ (Hermann, 2008, p 29).

Commercialization. Universities A and C, both research oriented, had well-developed and successful programmes to support the commercialization of academic enterprise. Both universities emphasized that student enterprise requires a clear and different treatment. The GEIE at University C in particular stressed the focus on student entrepreneurship as
substantively different from the research enterprise support (RES) for academic enterprise resulting in a policy ‘not to seek to take a stake at all in student enterprise as this inhibits innovation and is overly bureaucratic’. University C had 28 award-winning spin-out companies, based on university patents, in addition to over 100 license deals secured in the past five years, as well as collaboration agreements with several global brands.

Real-world experience. The GEIE at University D provided opportunities for students, graduates and postgraduates to work on live business projects under the supervision of faculty. Established in 2006 and self-sustaining, University D’s GEIE provided consulting experience to about 50 graduates a year in addition to working with more than 100 clients and attracting £250,000 in fees.

Real-world experience was incorporated into the curriculum in sandwich courses and other innovative ways such as in the Master’s programme at University E. This is an MSc in business management, based on assignments in four companies and aiming to offer students serial experience in intrapreneurship.

The experiences of Universities D and E were in line with current trends, as more and more universities in the UK and elsewhere are integrating real-world experience through internships and work placements, industry-based assignments and development of graduate consulting practices.

Communications

Internal communications. Effective internal stakeholder partnership was dependent on internal communication processes and structures and could be enhanced by the physical proximity of related units and participation in key activities such as preparation of reports and participation in funding bids. At University A one of the key objectives for enterprise was to create a community of practice engaging staff and faculty across the university and external stakeholders. Stakeholder communications included regular steering committees and advisory groups, staff development opportunities, exhibitions and awareness events with many such key initiatives occurring at the university’s bespoke – and flagship – GEIE. At University D most of the relevant staff and services were housed in one building thus helping to strengthen effective communications and partnership.

Marketing and promotion of graduate enterprise activities. The experience of participating universities suggested that the methods which worked best in promoting enterprise services to students were:

- Advertisements in the student paper;
- An effective website;
- Careers fairs and open days;
- Facebook, Twitter and other social-media networking;
- Follow-up calls, important for reinforcing attendance;
- Getting people through the door of hatcheries through visits and regular events and practical links with curriculum-based activities;
- Plasma screens around campus;
- Set-piece events and competitions;
- Social enterprise, also a good way of attracting students who had preconceptions about enterprise;
- The student enterprise society; and
- Word of mouth.

Dynamic web-based graduate enterprise information resources. The websites of the universities surveyed were static and outdated, with little interactive content or use of web2 technologies and information on student and graduate enterprise scattered across several disparate areas and sites. This was somewhat surprising, considering that web-based communication is now critically important for the effective promotion of events and activities to the wider public and students: enterprise educators need to be seen to be ‘walking the talk’, making contact with potential clients on the clients’ own terms. A static and unattractive website is of little help in attracting the interest of students who are voracious users and shapers of online technologies.

One notable exception to the above was the GEIE website at University B. Following extensive market research by an independent company that recommended pulling together all university enterprise activities into one site, the GEIE’s website was re-launched and has subsequently received favourable reports of improved client experiences and a substantial increase in bookings for various activities. The home page on the GEIE’s website is dynamic and engaging, with up-to-date listings of events and opportunities, a lively twitter feed, as well as blogs mostly written by student entrepreneurs and thus providing a sense of student engagement and a professional feel.

University level peer networking. An example of this is Yorkshire Universities, the association for the higher education sector in Yorkshire and Humberside. Participating universities in the present research in this region were members of this association. With regard to the enterprise agenda, Yorkshire Universities provided an obvious and effective forum for joint bidding and research, such as the regional Entrepreneurial Intentions Survey. Equally, the nine East Midlands universities...
collaborated through the East Midlands Innovation Network which brought students and graduates together from across the region’s HEIs for an intensive enterprise support programme which added value to enterprise provision within the HEIs themselves and secured additional support from the regional development agency, HEFCE and the ERDF.

Strategic drivers
Strategic action plans. University D considered its strategy to drive enterprise across the whole institution as highly relevant not only to teaching and learning but also to its research, innovation and enterprise strategy as well as to the employability of its graduates and international engagement. The experience of University D was in line with the conclusion of the Hermann report that ‘aligning institutional entrepreneurship goals with clear outcomes and outputs is essential to exploiting the potential impact of individual learning activities and experiences. The creation of an overarching institutional enterprise and entrepreneurship framework can guide strategy and aid impact measurement’ (Hermann, 2008, p 15).

Although University C had received an entrepreneurial award for its enterprising efforts and activities, it was surprising to find that it lacked both a mission statement and an institutional enterprise policy. Faculty level enterprise action plans were also absent. It appeared that a critical level of student involvement in entrepreneurship had been achieved at University C, which provided the momentum for further progress in an organic fashion.

Alignment with regional and local economic development and industry. University D provided a good example of an entrepreneurial university that is expected to make substantial contributions to social and economic development by working together with industry partners and developing skilled professionals and innovators. University D had a history of being a proactive player in economic development in the region where it is located and working closely with economic development partners.

University D’s unique history, entwined with the economic development of the area, played a significant role in shaping its current direction and engagement with the wider community. The site in the town where the university was founded was bequeathed by an international company and during the recession in the early 1990’s the university emerged as the largest local employer, driving development and economic regeneration of the area. More recently, when a multinational company pulled out of the area University D, supported by the RDA, took over that company’s research and development innovation centre and subsequently transformed it into a regional science park.

Capacity building. Notwithstanding the emphasis on creating an environment conducive to building entrepreneurial skills, the prevailing assumption among faculty remains that enterprise related activities carry much less weight than research in building an academic career. As one interviewed stakeholder remarked,

‘... at one level entrepreneurial activity counts for nothing. It’s not research, not teaching. So, the incentives aren’t obvious. There’s a view from the top-down also that enterprise isn’t that important; there’s a clear assumption research is more important.’

This supports the view that there is a need to provide appropriate incentives in order to engage faculty more fully in enterprise activities. Various incentive structures, internal staff development, inviting speakers from industry, external tutors, as well as providing students with real world experience, were all used by participating universities in order to build capacity.

Monitoring and evaluation of enterprise activities. A frustrating finding was the lack of available data regarding extra-curricular student and enterprise activities implemented by the participating universities. This limited the ability of the institutions to understand the market, learn from experience and improve the offerings of their respective GEIEs. The NCGE (2007) best practice report also commented on this point stating that,

‘...to assess the outcomes of activities, information from participants is ideally required. Little relevant data is available from, or collected by the case study HEIs.’ (Botham and Mason, 2007, p 81)

While there was a dearth of evaluation and monitoring regarding the range of graduate enterprise activities, pockets of emergent good practice were found such as University E’s adoption of the guidelines proposed by the new UK Business Incubation quality standards for business incubation. In addition, University D was using the NCGE Entrepreneurial Outcomes Framework as a planning and review tool.

Sustainability of enterprise activities. The GEIEs at Universities A and B were established separately from other units such as faculties and departments and depended on short-term funding. Universities C, D and E set up semi-autonomous units to deliver enterprise education and support services, while maintaining strong links with the respective Business Schools as
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manifested by the employment of leading personnel from the semi-autonomous units by the Business Schools. It is possible that links with existing departments and faculties enhanced the longer term sustainability of the GEIE, although the autonomous enterprise education unit at University A gained traction and was expected to achieve a good degree of sustainability.

Evidence from the participating universities supported the NCGE’s (2007) call for self-financing and independent units providing cross-university enterprise education. However, it is recognized that achieving a self-financing level may be difficult (Botham and Mason, 2007).

Leadership and institutional culture

Senior leadership commitment. The mission of University D’s Vice Chancellor since 2003 had been ‘...to make University D the leading enterprise university in the country’. Given this Vice Chancellor’s determination and leadership, income from commercial and non-fee sources outstripped the increase in student numbers. More than 60% of University D’s income was from commercial sources, with the remaining 40% derived from student fees. Setting standards for transparency and openness, this Vice Chancellor’s leadership style was crucial for the development and spread of entrepreneurial values throughout the university: initiative was celebrated, for instance, by rewarding interesting projects and enterprising staff.

Enterprise at University E was led by the Dean of its Business School who also acted as Dean of Enterprise with responsibility for the Research, Enterprise and Corporate Development Office. The dual role of the Dean was instrumental in shaping the Business School’s model for an entrepreneurial and commercial approach to be adopted across the university.

Internal partnerships. Collaborative leadership through effective internal partnerships was important yet rarely straightforward. It was significantly enhanced by the physical proximity of key players in Universities D and E, while in Universities C and E it was achieved through a well-established and accepted lead department or faculty. Structured communication channels and processes helped in developing internal partnerships in all five universities.

Staff champions. Champions are individuals who promote the enterprise agenda from the bottom up. To some extent successful champions assumed leadership of enterprise activity and strategy and championed these over many years, gradually broadening their remit and building on successes – as was the case in Universities C and D. Although all universities sought to accelerate this type of organic development by means of specific appointments and roles, short-term funding and consequent high staff turnover were limiting factors. Long-term champions had academic roles that linked them to longer-term career progression.

Student leadership. Proactive stimulation by university enterprise staff, membership of external national and international organizations such as the National Consortium of University Entrepreneurs (NACUE) and Entrepreneurial Action by Us (ENACTUS), and working with student union societies were measures adopted by the participating universities to develop and improve students’ leadership and entrepreneurial skills. Membership of student-led organizations was particularly important because ‘positions in student unions, clubs and societies offer students genuine entrepreneurial experiences that allow for experimentation with new ideas and concepts. They can also be a source of practical problem solving, opportunity spotting, project management, budgeting, communications, teamwork, coping with pressure and managing complexity’ (Hermann, 2008, p 8).

At University B the GEIE employed eight trained student interns who worked one day a week to develop and host enterprise initiatives and events. Student enterprise links were also employed for one hour a week to promote the GEIE across the university by means of lecture shout-outs, distributing flyers, and using Facebook. A social enterprise adviser was also available to support student societies in organizing and running enterprise events at the GEIE at University B.

Entrepreneurship research. Research and action research were critical leadership drivers in the participating universities. For instance, the Research Assessment Exercise confirmed University C’s Business School as an elite research-led institution with 70% of its research activity rated as internationally excellent or world-leading. University C’s Business School acknowledged enterprise and innovation as research strengths and a division dedicated to these was housed at the GEIE.

The GEIE at University E was an 11-person unit focusing on the creation and transfer of knowledge to develop enterprise and entrepreneurial capabilities. The GEIE brought together business owners, policy-makers and academics with shared interests in improving the environment for entrepreneurship and the competitiveness of individuals and small firms. Since its launch, the GEIE at University E has attracted more than £10 million in revenues to support the development of entrepreneurial activities.
Reputation. All participating institutions were well-regarded as enterprising universities. For instance, Universities A, B, C and E had variously been included in the NCGE good practice review (2007) and won awards as entrepreneurial university of the year and as enterprise educators. University D also earned a reputation as an entrepreneurial university locally, regionally and nationally.

Conclusions
This study revealed 21 benchmark indicators spread across 4 dimensions of a GEIE framework as shown in Figure 2. The identified key success factors for university-based GEIEs were embedded in these benchmark indicators and have been discussed in the above. On the basis of this discussion, we make the following conclusions.

In-curricular enterprise provision was dominated by business schools as manifested in three of the five participating universities. Although semi-autonomous, differentially-branded GEIEs were set up in the three universities and key personnel and senior champions were located in and employed by the business schools. Leadership by business schools appears to help in securing the longer-term sustainability of GEIEs, possibly due to strong connections between the business school links, enterprise activities and a research agenda providing a reliable long-term incentive structure for faculty champions. Notwithstanding the strong sustainability rationale for business schools to assume a leading role in enterprise activities, it was important that extra-curricular activities, available in all participating universities, were led by differentially-branded semi-autonomous units. Furthermore, involvement of diverse faculty in the preparation and delivery of enterprise modules was recommended for increasing university-wide engagement with these modules.

The importance of a long-term approach and commitment by senior university leadership cannot be overstated and was emphasized by all participants. As one stakeholder in University D stated, ‘too much university enterprise development is based on short-term initiatives; universities must ensure that enterprise is a core rather than a peripheral issue’. Similarly, a stakeholder at University C stated that, ‘... it is critical that graduate enterprise programmes are built into incentivization structures and that they have buy-in from the top’. Such a long-term approach requires incubation activities to be located in the context of a coherent programme of in-curricular and extra-curricular entrepreneurial learning which provides supply pipelines of students and graduates both into the GEIE and out of it and into the business world.

In addition to commitment by university leadership and a long-term perspective, the physical location of a university’s GEIE was a critical success factor. An enterprise centre helps to build partnerships and create synergies between key university departments and provides user-friendly ‘one-stop shops’ for the university community. However, to some extent such a centre needs to be differentiated from the university in its branding and be seen to have a business rather than a university location. Proximity to campus facilitates access to faculty and other university users: most good practice enterprise centres are physically located at the edge of the campus site. As the Dean of the Business School at University E, which housed one of the UK’s largest graduate incubators, commented, ‘locational advantage and great staff have been the most important elements of our success’.

Three weaknesses were identified in this study. The first was communication infrastructures that were insufficiently developed in all the participating universities. Use of effective websites and web2 communications are critical for the effective presentation of activities and events to students and graduates, while enterprise educators need to demonstrate that they ‘walk the talk’ when communicating with potential users. As explained by a stakeholder at University B, whose website is a best practice example, market research with students led to a much more interactive website that gathered all student enterprise activities into one place with the result that there was a substantial increase in bookings.

Lack of relevant data regarding extra-curricular student and graduate enterprise activities was the second weakness of participating universities because it limited their ability to understand their markets, learn from experience and improve what their GEIE offered. This weakness in monitoring and evaluating GEIE activities reflected the lack of a coherent Government policy focus.

The third weakness was absence of diversity. Based on discussions with participants and our own observations in the course of visiting the participating universities, it appeared that the level of participation by some ethnic minorities and international students in enterprise activity is high, perhaps reflecting the enterprise ethos of the nations of origin concerned. However, there was insufficient analysis or identification of under-represented ethnic minority groups at this key stage in the development of their capabilities and aspirations. Furthermore, given the particularly small numbers of young female entrepreneurs in the UK and significant employability issues facing disabled students, there is certainly scope for further research in this particular area.
Because the framework is embedded in a sample of UK universities only, it will benefit from further scrutiny, development and application in other contexts and economies, perhaps especially so in, for instance, the six oil- and gas-rich Gulf Cooperation Council countries, where young graduates are encouraged to seek employment in the private sector and supported to establish their own businesses (Kerr, 2012) because it has been realized there that the decades-old policy of virtually guaranteeing employment in the bloated public sector for their citizens is unsustainable. In this region there is now a noticeable drive to stimulate employment growth in the private sector, in conjunction with a strategy to shift the expectations of young graduates away from a predictable and traditional career in government bureaucracy. As a result, business incubators have been established within universities in close partnership with industry, and have been supported by the governing institutions (Albawaba, 2013; Moussly, 2011; Mesbah, 2011; Mesbah, 2012; Dubai SME, 2012). Thus, extending the application of the GEIE framework to this under-researched context will enrich and extend our understanding and analysis of GEIEs, their practices and impact at the social, economic and political levels.

**Notes**

1 Regional Development Agencies (RDAs) were non-departmental public bodies in England, charged with driving economic development, business efficiency, investment and competitiveness, employment, skills and sustainable development in their regions. Similar but separate arrangements were put in place in Northern Ireland, Scotland and Wales. The incoming Coalition Government announced the proposed abolition of the nine Regional Development Agencies (RDAs) in England in 2010: all the Agencies closed on 31 March 2012 and were abolished on 1 July 2012. See, for example: http://www.politics.co.uk/reference/regional-development-agencies (last accessed 07 April 2014).

2 The Research Assessment Exercise was conducted jointly by the Higher Education Funding Council for England (HEFCE), the Scottish Funding Council (SFC), the Higher Education Funding Council for Wales (HEFCW) and the Department for Employment and Learning, Northern Ireland (DEL). The primary purpose of the RAE 2008 was to produce quality profiles for each submission of research activity made by institutions. RAE 2008 has been replaced by the Research Excellence Framework, REF, the primary purpose of which is to produce assessment outcomes for each submission made by institutions by assessing the quality of research in UK higher education institution. See also: http://www.ref.ac.uk/ (last accessed 08 April 2014).

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