Redefining entrepreneurial learning paradigms in developing countries

A case study of Ghana

D. Owusu-Manu, S.K. Afrane, E. Badu, D.J. Edwards and M. Brown

Abstract: In a rapidly changing world of knowledge exchange, innovation and technological advancements, entrepreneurship continues to fuel economic growth in both developed and developing countries. In the developed world, an increased influx of graduate entrepreneurs sustains economic growth whilst, in contrast, developing countries continue to suffer from a dearth of entrepreneurial learning mechanisms. To remedy this situation in Ghana a collaborative and interdisciplinary venture, involving the Business School of the Kwame Nkrumah University of Science and Technology and an international panel of experts, has developed the Kite Vision Actualization Laboratory (KVAL). The raison d'être of the KVAL is to support and nurture talent, develop and implement business solutions and innovations, encourage the development of entrepreneurial undergraduate and postgraduate programmes and stimulate graduate business start-ups. The KVAL integrates four development stages of entrepreneurial learning: knowledge transfer and exchange; innovations and inventions; technology and enterprise development; and panel review, assessment and final approval protocols. The innovative KVAL framework mirrors demand-led transformation and self-actualization processes that represent a departure from traditional offerings in entrepreneurship education.

Keywords: entrepreneurship; graduate enterprise; business laboratory; vision actualization; Ghana

D. Owusu-Manu is a Lecturer and E. Badu is an Associate Professor in the Department of Building Technology, Kwame Nkrumah University of Science and Technology, Ghana. S.K. Afrane is Associate Professor, Development Planning and Policy, at Kwame Nkrumah University of Science and Technology. D.J. Edwards (corresponding author) is Professor of Industrial Innovation at the Centre for Business Innovation and Enterprise, Birmingham City Business School, Room G233, Galton Building, City North Campus, Birmingham City University, Perry Barr, Birmingham B42 2SU, UK. E-mail: david.edwards@bcu.ac.uk. M. Brown is Professor of Corporate Reputation and Strategy at the Centre for Business Innovation and Enterprise at Birmingham City Business School.

Redefining entrepreneurial learning: the Ghana experience

The promotion of graduate entrepreneurship education is often heralded as a panacea for the social, economic and political challenges facing both developed and developing countries (McLarty, 2003; Pittaway and Cope, 2007; Matlay, 2008; Harrison and Leitch, 2010). In Ghana, a developing country, 'entrepreneurship development' has gained political prominence and the national government has proactively stimulated entrepreneurial activity to engender economic growth. A key, integral feature of the government's economic strategy policy document, 'Ghana – Vision 2020', is a development strategy for securing strong regional and national economic growth that provides for a broad-based improvement of national living standards (Doni-Kwame, 2007).

To realize these ambitions, the Ghana Venture Capital Trust Fund (GVCTF) was created in 2006 (by Act of Parliament) to provide young entrepreneurs and small to medium-sized enterprises (SMEs) with equity capital, and nurture the development of Ghana's fledgling venture capital industry (Financial Times, 2011). Initially seeded with approximately US$15 million capital, the GVCTF now incorporates over $US55 million of working capital mobilized through national and foreign alliances and encompasses a portfolio of diversified investments of US$17 million with over 39 companies. More recently, the GVCTF introduced a US$100 million 'Angel Fund' accompanied by the recent launching of Ghana Angel Investor Network. The Angel Fund objectives are to engender opportunities for early business start-ups, reduce the pressures associated with finance to which nascent entrepreneurs are subjected and spearhead economic transformation within the West Africa sub-region (*ibid*); and the Ghana Angel Investor Network seeks to attract investors for early-stage businesses. The economic imperative to harness the latent potential of Ghanaian graduates triggered the drafting of several crucial policy documents: the National Youth Policy of Ghana, the National Youth and Employment Programme and the Ghana National Entrepreneurship Programme. Within these documents the Government stated its objectives with regard to increasing and spreading the number of graduates propagating businesses in Ghana and accelerating job creation and embedding entrepreneurial development into the mainstream curricula of universities (NYPG, 2010). Cumulatively, these policy documents provide a blueprint for achieving the goal of the eventual eradication of poverty.

Despite these initiatives, the slow pace of infrastructure development is restricting the development of graduate entrepreneurship in Ghana (Dzisi, 2009). This lack of progress (Financial Times, 2011), coupled with a dearth of Higher Education Institutions (HEIs) capable of delivering entrepreneurship education, presents the country with a significant strategic challenge (Adda and Hinson, 2006; King and McGrath, 1999). Ghana's educational system does not currently make provision for entrepreneurship teaching and learning (NYPG, 2010). It relies instead upon a declarative traditional knowledge transfer process, rather than enabling entrepreneurial free thinking and flair (Perkins, 1994; Kirby, 2002; Illeris, 2007). From a humanistic psychology perspective, successfully delivering educational solutions relies upon educators developing a holistic understanding of students (*ibid*). This translates into designing educational programmes and post-learning support mechanisms, and creating learning institutions that nurture the individual's emotional health, personality and creativity (*ibid*; Jarvis, 2006).

This paper presents a framework for a 'bottom-up' approach to graduate entrepreneurial education and training and a methodology for incubating business ideas in HEIs in Ghana. Inspired by the philosophy of harnessing entrepreneurial knowledge, innovations and technology (Mukhtar *et al,* 1999) – and assisted by an international panel of experts, the Kite Vision Actualization Laboratory (KVAL) – Ghana is exemplified as a hybrid, industrial demand-led venture offering transformational and self-actualization entrepreneurial programmes. The KVAL initiative also relates closely to the global campaign to create entrepreneurial HEIs (see, for example, Kristensen, 1999; Meira-Soares and Amaral, 1999; Pawlowski, 2001). The research is contextualized within three generic strands of literature: entrepreneurial learning paradigms (Sullivan, 2000; Minniti and Bygrave, 2001; Gibb, 2002a; Warren, 2004; Lourenco and Jones, 2006; Rae, 2006); entrepreneurship education scholarships (Jack and Anderson, 1999; Leitch and Harrison, 1999; Drucker, 2001; McAdam and Marlow, 2008; Smith 2010); and business incubation scholarships (Hannon and Chaplin, 2003; Grey *et al,* 2011). There are four principal reasons for adopting this approach.

- It accommodates a narrative contextualization in which the innovative entrepreneurial learning paradigm unfolds.
- The philosophy, rationale and character of the KVAL are further revealed and explained.
- It demonstrates that pragmatic and applied entrepreneurial learning processes require the collective effort and positive integration of all stakeholders (including educators, students and policy-makers) before, during and after the programme (Adda and Hinson, 2006).
- The innovative and novel KVAL framework mirrors demand-led transformation and self-actualization

processes, thus representing an innovative university incubation system.

Methodological perspective

Consistent with Gibb (2010), this research does not conform to any conventional quantitative (analytical) methodology *per se.* Instead, it follows an action learning approach, where the objective establishes basic concepts underpinning the development of an entrepreneurial learning programme. This work is thus best described as a reflective piece aimed at stimulating wider debate.

A critical review of the extant literature was carried out to elicit knowledge of pertinent entrepreneurship education scholarships in Ghana and abroad (*ibid*) and published national data from the National Youth Policy of Ghana, the National Youth and Employment Programme and the Ghana National Entrepreneurship Programme. From this body of knowledge the study's theoretical framework and basis for systematically developing the KVAL framework was produced (Webster and Watson, 2002; Levy and Ellis, 2006). The review was intentionally directed at entrepreneurial learning paradigms, thus providing a critical discourse on entrepreneurship education and entrepreneurial learning scholarships.

The authors' experiences as entrepreneurs and educators in the field of entrepreneurship inspired the paper's concepts and contextualization and influenced the research process adopted. A review of the literature on entrepreneurship development and practices clearly indicated the presence of cultural, ethical and leadership dimensions which are sustained through a process of human action and interaction (see, for example, Dainty, 2007; Osei-Tutu *et al,* 2010). Cumulatively, these constructs resemble idealistic assumptions and hold a rich value-laden axiological position.

Entrepreneurial learning paradigms

In parallel with the global impetus to create entrepreneurial HEIs (Zaharia and Gibert, 2005; Gibb and Hannon, 2007; Gibb *et al,* 2009) there is increasing concern that the boundaries between entrepreneurship and enterprise education and work-related learning should be clarified (Dwerryhouse, 2001). However, research into enterprise education suffers from conceptual and contextual shortcomings which can prevent the integration of existing knowledge into entrepreneurship education (Matlay, 2005a; 2005b; 2008). Academic proponents of entrepreneurship studies contend that enterprise education is the process of providing individuals with the ability to recognize

Table 1. Defining entrepreneurship education and entrepreneurial learning.

Author(s)	Definition
Kourilsky (1995)	Opportunity recognition, marshalling of resources in the presence of risk and building a business venture.
Gottleib and Ross (1997)	Creativity and innovation applied to social, governmental and business arenas.
Bechard and Toulouse (1998)	A collection of formalized teachings that informs, trains, and educates anyone interested in business creation, or small business development. A process that combines innovation, creativity and the acquisition of enterprise competencies to create and sustain a new business venture.
Davies (2002)	The ability to handle uncertainty and respond positively to change; to create and implement new ideas and new ways of doing things; to make reasonable risk/reward assessments; and act upon them in one's personal and working life.
Draycott and Rae (2010)	Enterprise education competencies should consist of knowledge (about the specific project or business), specific projects skills and general capability; that is, the ability or predisposition to set up and run projects.
Pittaway and Cope (2007)	Learning that occurs during the new venture creation process.

commercial opportunities and the insight, self-esteem, knowledge and skills to act on these opportunities (Davies, 2002; Charney and Libecap, 2003; Gibb, 2010). Although there is no universally accepted definition in the extant literature of what constitutes 'entrepreneurship', there is general agreement about what constitutes 'enterprise education' and 'entrepreneurial learning' (see Table 1).

Within the extant literature, two dominant paradigms in enterprise education exist: the traditional approach and the constructivist approach (Krueger and Hamilton, 1996). In the traditional mode, teaching focuses on theory and knowledge is transmitted to learners (Watkins-Mathys and Foster, 2006; Krueger, 2007:2009; Rae and Carswell, 2000). In contrast, the constructivist approach argues for situated learning where students must self-develop ways of organizing knowledge as they acquire it (building and changing their own mental models to represent knowledge) (Krueger, 2003; 2007; 2009). The constructivist approach thus focuses on practise of behaviours, developing skills and reinforcing attributes associated with being an enterprising person (Caird, 1992; Gottleib and Ross, 1997; Rae, 2000).

Redefining entrepreneurial learning: the Ghana experience

The topic of entrepreneurial learning has received a great deal of attention in academic research (Penn *et al,* 1998; Huovinen and Tihula, 2008). For instance, Pittaway and Cope (2007), cited by Pickernell *et al* (2010), recognize that while some authors observe entrepreneurial activity extending beyond the new venture creation phase, others concentrate more on business conception. The experience acquired from social interactions, networks and relationships expound the 'learn as you go concept' of entrepreneurial learning as described by Gibb (1997). Gelderen *et al* (2007) and Gibb (1997) explain that as entrepreneurs engage in various relationships they are exposed to different experiences from which learning can take place. In developing entrepreneurial graduates (individuals) the consensus of knowledge provides the guiding philosophy for articulation of the KVAL, which postulates that different entrepreneurs learn and operate in a multitude of ways depending on experience. This involves factors ranging from perceptions of risk through to the availability of resources at their disposal (Pickernell *et al,* 2010).

Contextual view of developing entrepreneurial undergraduates

According to Kharbanda (2011), the success of business, science and technology education lies in its contribution to the advancement of knowledge (Pittaway and Hannon, 2008; Rae *et al,* 2010). At the turn of the 21st century there appeared to be increasing national and international interest in trans-university entrepreneurship education (Gibb *et al,* 2009). Whilst many business faculties currently (2012) offer majors in entrepreneurship, in addition to majors in more traditional areas such as finance and accounting, non-business faculties also offer minors in entrepreneurship.

Convergent views in the literature on entrepreneurship suggest that entrepreneurial graduates are essential for future national economic success and that HEIs play a crucial role in developing a supportive environment for enterprise education (Rae *et al,* 2010). For instance, Hegarty and Jones (2008) examined how pedagogy inhibits students moving into graduate entrepreneurship. Greene and Saridakis (2007) focused on understanding the factors concerning UK graduate entrepreneurship and highlighted two reasons why these factors are important. First, few studies have been undertaken on the factors driving graduate entrepreneurship; and, second, a gap exists in the evidence regarding an understanding of the motivation of graduate entrepreneurs. Nabi *et al* (2006) and Nabi and Holden (2008) identified three issues in particular

with regard to graduate entrepreneurs: the individual personal characteristics that contributed to graduate entrepreneurship, the value of the graduate's experience and the influence of entrepreneurship support programmes and related incubation initiatives (Greene and Saridakis, 2007). It is the latter of these three that is particularly appropriate with regard to this present study.

McLarty (2003) found low levels of graduate entrepreneurship being recorded, due to a lack of relevant business support services, non-availability of incubation programmes and lack of suitable information. This represents a considerable problem for young graduate entrepreneurs with minimal prior work experience: even if they have an entrepreneurial intention, a lack of access to networks will restrict business opportunities (Chrisman and McMullan, 2004).

Classical models of entrepreneurial education

With the global development of spin-off companies and university-based intellectual property rights, the rise of the entrepreneurial culture and activities is rapidly becoming part of the broader institutional culture (Liu, 2012). Accordingly, Pittaway and Hannon (2008) categorized entrepreneurial education into two main groupings or clusters: the single department-led model; and the campus-wide model. They identified three versions of the single department-led model: early stage, development stage and outreach stage.

The early stage model describes a situation where there are a few individuals who have either been given, or have taken, responsibility for developing entrepreneurial education within the HEI (Pittaway and Hannon, 2008). Characteristically, there is no coordinating function (for example, an organizational entity such as a centre, unit or team) other than informal contact between the individuals concerned. These individuals may be from different parts of the HEI and they may or may not have research interests in the subject. The success (or otherwise) of the model is largely dependent upon the efforts of a few individuals who champion its development (Pittaway and Cope, 2007; Pittaway and Hannon, 2008).

The second, development stage has been described as an organizational entity, whether an established team, an organizational unit, a centre or institute, which exists within the department or school (Wright *et al,* 2007; Siegel *et al,* 2007). Thus both curricular and extra-curricular activities are organized and managed by a dedicated team and these activities contribute significantly to the life of the department (Pittaway and Hannon, 2008).

The third, outreach stage of the single department-led model represents an established organizational entity within a school which is more outwardly facing in terms of its interaction with the wider university (*ibid*). This model may typically offer a range of activities and a curriculum open to students from across the university.

In contrast to the department-led model, the campus-wide model describes a situation where the HEI seeks to provide enterprise education across departments and disciplines (see, for example, Pittaway and Cope, 2007; Pittaway and Hannon, 2008). As with the single department-led model, three versions of the campus-wide model are identified in the literature: 'campus-wide embedded', where enterprise education is located in various departments across the HEI; 'campus-wide centralized', where enterprise education represents a more formalized entity; and 'multiple department-led collaborative venture' which aims to combine both of the former approaches into one.

Learning to practise: the role of business incubation

Infusion of practice-based learning activities, translation of learning into practice and promotion of business growth and innovation are important industrial policy aims in both developed and developing countries (Lalkaka, 2003; Grey *et al*, 2011). Business incubators are an important operational aspect of policy by means of which institutions support immature businesses to enable them, the businesses, to survive the critical start-up phase (Aerts *et al*, 2007). Business incubators have been described as business development processes applied to enhance and accelerate the pre-start, launch and early start and growth phases of a new venture opportunity (Lalkaka, 2003; Murray *et al*, 2012). The implementation of incubation policy and practice is primarily and largely focused on developing an effective supportive environment in which '. . .market-led ideas, and new ventures can be developed and are given the chance to fulfil their potential by providing access to opportunities, a wide range of development resources and tailored support services' (Hannon, 2005). Most incubators therefore offer a network of business relationships to their tenants, consult tenants on business matters such as business plans and the further development of the company, help with fund-raising, provide general office equipment and offer marketing and financial advice (see, for example, Gstraunthaler, 2010).

Further to the emergence of the incubation concept and practice, business incubators have metamorphosed from the managed workspaces, enterprise agencies, industrial estates, science parks and business centres that were prevalent in the 1970s, into multi-purpose and specialized incubators by the end of the 1990s (Hannon, 2005). Multi-purpose incubators are designed to accommodate different enterprises from a variety of economic sectors; and, in contrast, specialized incubators in this context are those designed to address particular industrial needs and demands – for example, technology incubators, incubators without walls (that is, virtual incubators) and sector-specific incubators (see, for example, CSES, 2002). In explaining business incubation models, Thompson and Downing (2007) identified four types: science parks (where incubation is a core element and activities are research-led); property-based incubators (supported by public or private benefactor funding); corporate incubators (research-led but housed by individual organizations to encourage spin-outs); and venture capital driven incubators (supported by venture capital which promotes company formation and development).

Business incubators are now evolving into 'hybrid ventures' with the involvement of multiple stakeholders such as clients firms, government institutions, universities, venture capital firms and angel investors and large firms (CSES, 2002). For the purposes of this present research, business incubators are defined as hybrid ventures characterized by the presence of a full range of resources (including financial, human and material) whose stakeholders are engaged in mutual relationships to provide a wide range of services (including training and education and business, technical, managerial and financial support) and whose intent is to create an enabling environment that fosters creativity, innovation and entrepreneurship among graduate entrepreneurs. Many studies have dealt with examining the impact of incubator programmes, including assessing critical success factors and best practices (see, for example, Colombo and Delmastro, 2002; Grey *et al*, 2011). These authors suggest that business incubators are modelled along varying dimensions taking into consideration technology transfer, growth and performance of the enterprise, innovation and regional integration (*ibid*). Business incubators are shaped by their framework conditions and are thus dependent upon the particular context in which the incubator is established.

The KVAL initiative and entrepreneurship development at KNUST

The Kwame Nkrumah University of Science and Technology (KNUST) in Ghana was established in 1952 and it is now structured into six colleges: the College of Agriculture and Natural Resources, the College of Architecture and Planning, the College of

Engineering, the College of Health and Allied Sciences, the College of Science and the College of Arts and Social Sciences. The direction and progress of scientific endeavour at KNUST is based upon the university's declared mission – to provide an environment for teaching, research and entrepreneurship training in science and technology for the industrial and socio-economic development of Ghana, Africa and other nations. However, despite this stated aspiration, progress in developing the necessary infrastructure to support the development of graduate entrepreneurship at KNUST and more generally in Ghana has been slow. Moreover, a once thriving consultancy unit housed within KNUST has become largely redundant and obsolete. The apparent lack of recognizable progress, in addition to factors such as a noticeably high rate of graduate unemployment, an increasing trend of graduate Ghanaians leaving Ghana, a dearth of capable institutions and an ambivalent policy to supporting graduate entrepreneurship programmes, all present significant challenges for stakeholders. Designing innovative educational (entrepreneurial) programmes, providing post-learning support mechanisms, enabling learning institutions and creating conducive learning environments that would develop the emotional health, personality and creativity of students are possible solutions to these problems. The development of the KVAL entrepreneurial learning methodology was one such response.

Integrated landscape of the KVAL

The ideal KVAL candidate is likely to be judged on the extent of their innovativeness and potential for growth (Alsos *et al*, 2011). Typically, participants (referred to here as 'team-mates') are selected by panel experts who classify the individuals into two groupings. Group A consists of new graduates, from any academic discipline, with '. . .brilliant ideas and innovative business concepts' that could be developed. Group B comprises graduate entrepreneurs who want to enter the laboratory to explore new ideas and devise new solutions to their business problems. The KVAL actively seeks to help accelerate the growth of early-stage ideas and businesses into venture-ready companies by facilitating the birth and growth of start-up businesses and providing the necessary support resources. This approach reflects the nature of an entrepreneurial venture which needs to focus on action learning that combines all key aspects of entrepreneurial practice and leadership (Gibb *et al,* 2009).

The KVAL programme consists of four interdependent sub-laboratories (Figure 1) with time allowed for action and learning between each phase of the development process as follows: Research and knowledge transfer hub (idea development stage); Innovations and inventions hub (pre-incubation stage); Technology and enterprise development hub (incubation stage); and Panel review, assessment and final approval protocols (post-incubation stage). Although each phase is shown as rigid and fixed, for the purposes of diagrammatic representation and ease of communication, a degree of flow and flexibility inevitably exists between these phases to facilitate cross-pollination of ideas and initiatives and allow them to flourish unhindered by rigid administrative controls and processes.

Each phase was adapted from similar entrepreneurial learning methodologies – for instance the WICED model proposed by O'Carroll and Millne (2010) and CRER methodology of Moreira and Martins (2009) – which involves different actions and tasks. Each action has learning procedures and methodologies that facilitate the KVAL development process whilst supporting the potential entrepreneur throughout the KVAL experience. The duration of each phase of the KVAL entrepreneurial learning programme is approximately four to six weeks, up to a maximum of eight weeks. This allows team-mates to collect the necessary information to develop their business ideas and proceed to the programme's next phase. Also, in each phase of the programme, dedicated and highly experienced KVAL advisers are assigned to supervise and work in partnership with the team-mates. The task for KVAL advisers is to develop KVAL team-mates, provide access to the KVAL experience, encourage best practice and monitor and support progress of team-mates in and outside the laboratory (O'Carroll and Millne, 2010).

The research and knowledge transfer (idea development stage) hub of the KVAL creates a research facility with the aim of generating primary research in order to strengthen and deepen the existing knowledge of would-be graduate entrepreneurs (O'Carroll and Millne, 2010). The overall objective of this phase of the KVAL programme is to develop the intellectual capacity of the team-mates and an understanding of how to absorb the concept of entrepreneurial learning. As such the principal activities include acquisition, sharing and exchange of knowledge (see, for example, Gibb *et al*, 2009). Consistent with the two dominant paradigms in enterprise education (namely the traditional and constructivist approach – see Krueger and Hamilton (1996) – learning activities in the research and knowledge transfer stage will be achieved through a range of initiatives, including specially designed sessions for 'blue-sky thinking', panel discussions, peer tutoring, and action learning, and group work and the
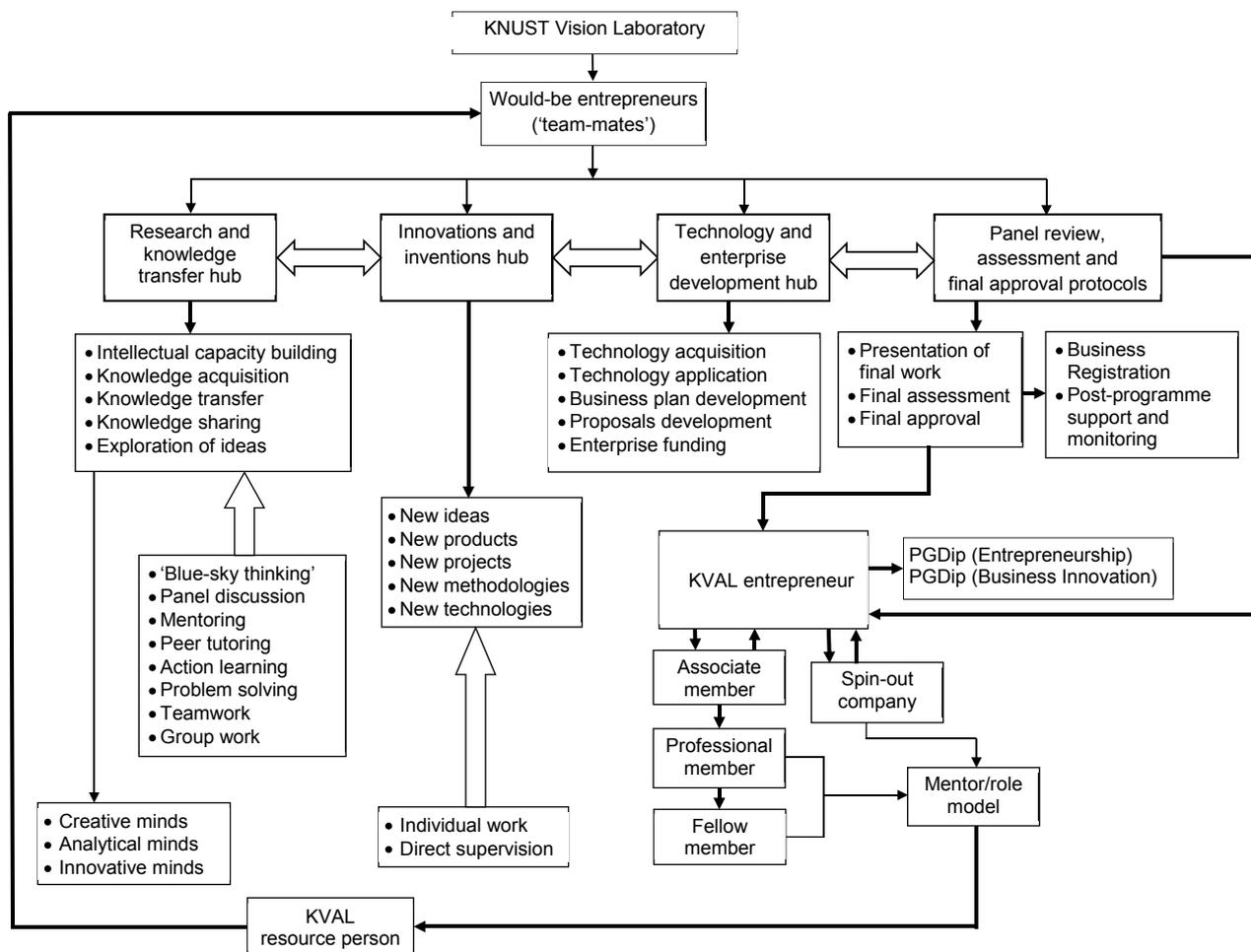
Figure 1. KNUST Vision Laboratory (KVAL) framework.

application of problem-solving techniques (Krueger, 2009; Draycott and Rae, 2010). At this stage, team-mates will be expected to develop creative and analytical minds (see, for example, Bechard and Toulouse, 1998) and form their own creative teams for innovative activities within and beyond the laboratory.

The innovations and inventions hub (or pre-incubation phase) focuses on leading innovations and inventions from the bottom and empowers team-mates to take risks and build rewards around these. The team-mates spend time working on innovation activities and are expected to develop new products and new projects, to invent new technologies and develop new methodologies. The driving force here is encouragement of creative thinking, new invention and innovation in entrepreneurship, new models of intellectual property protection that stimulate creativity and enterprise education reforms that replaces rote learning with initiatives that stimulate creativity, entrepreneurship, sustainability, hands-on learning and original thinking.

The technology and enterprise development hub is designed to create pedagogy that supports the development of entrepreneurial behaviours, skills and attributes. It focuses on deployment of innovations and inventions, application of technology and translation of new ideas, projects, products and methodologies into viable business ventures. Once this is achieved the pedagogical challenge is to create a learning environment which provides opportunities for practising and developing these behaviours, reinforces the attributes and develops the skills (Gibb, 2002a; 2002 b).

Team-mates will acquire business acumen and be offered the opportunity to acquire competencies in business planning, proposal writing, management, leadership, negotiations and enterprise funding. These learning experiences will be complemented with real life business exposure through industrial internship, which provides a conducive environment for entrepreneurial learning where the learning takes place in an instructional context and an uncontrolled

Redefining entrepreneurial learning: the Ghana experience

pedagogical environment (Gibb, 1997). Industrial internship recognizes that most learning which takes place is through relationships with the relevant stakeholder environment.

Finally, the panel review, assessment and final approval hub is the culmination of the KVAL entrepreneurial learning programme. Described as the 'experimentation and test' phase, it allows team-mates to test their business ideas in advance of the formal creation of the enterprise (see, for example, O'Carroll and Millne, 2010). This phase is designed to allow team-mates to participate in workshop discussions and seminar presentations and focus on important areas of business creation. Thus, team-mates can present their work (that is, business concept, business plans, business proposals, and so on) to assessors, potential investors and businesses in return for critical inputs, endorsements and support. The KVAL will provide the necessary support services by matching team-mates to potential investors, venture capitalists, angel financiers and businesses. Team-mates will also be helped through all the required business registration processes and licensing protocols.

Design conceptualization of the KVAL

The KVAL concept design and practice is shaped by distinct conceptual and philosophical issues: design philosophy, institutional strategy and practice and learning environment. In terms of design philosophy, the KVAL acknowledges that talented would-be graduate entrepreneurs can become more successful if they are properly nurtured, provided with necessary support mechanisms to develop, experiment and test their innovations and are integrated into an opportunistic environment in order to share ideas and build new strategies for growing their own companies (Andersen *et al*, 2000; Gibb *et al*, 2009).

The experimental business laboratory approach to entrepreneurial learning inspired the development of the KVAL initiative. Andersson *et al* (2009) explain this approach as being a network of outsiders – that is, entrepreneurial individuals coalesced from universities, research laboratories, start-ups and business partners – within an entrepreneurial innovation ecosystem. Sundbo (2011) further describes the experimental business laboratory as encapsulating both physical and logical environments which enable and facilitate two key stages of the innovation and entrepreneurial process. It also facilitates the creation of ideas and early testing of possible diffusion patterns in terms of viability and probability of success. Within an experimental business laboratory, innovative business ideas with high-growth expectations can be tested and a network of

interconnections binds aspiring entrepreneurs, experts and non-experts together. This fertile environment provides an important opportunity for the radical transformation of, and departure from, the 'business-as-usual' habit, because each participant learns from the experiences of the others (Curley and Formica, 2010).

Would-be entrepreneurs in the experimental business laboratory can perform business experiments along a spectrum – from the 'known knowables' to the 'unknown unknowns', covering a wide range of issues such as morale, self-motivation, tolerance to risk, trust, concern for fairness, team behaviour and other human factors and traits that occur in and influence contemporary economic life (Amidon *et al*, 2005; Gibb *et al*, 2009). The experimental business laboratory approach shapes a community of entrepreneurs where members complement rather than threaten each other's strengths. Both Amidon *et al* (2005) and Andersson *et al* (2009) describe this approach as a classic 'win–win' situation, reflecting an entrepreneurial culture which accepts that knowledge multiplies when shared (Gibb *et al*, 2009). Accordingly, the resulting interactions promote social and economic factors which engender entrepreneurial cohesion that in turn leads to the formation of the innovation ecosystem (Apgar, 2006).

In terms of institutional strategy and practice, the KVAL provides a hybrid configuration of campus-wide centralized and single department-led outreach models. These are entrenched in a formalized operational entity beyond the administrative jurisdictions of a particular academic department, but which incorporate subsidiary feeder units across all academic departments within the university. This strategy demonstrates a shift in emphasis from the predominantly business school-led approach of delivering entrepreneurship education towards a wider institutional strategy (Hannon *et al*, 2007). The central locus of this embedded institutional strategy is explained by its:

- innate potential to integrate the relative strengths in both instances, whilst balancing competing demands and concerns over fragility, survival, viability and future sustainability of entrepreneurial education within the HEI (see, for example, Jacob *et al*, 2003; Pittaway and Hannon, 2008) *inter alia* educational impact (for example, behavioural change, heightened awareness and research-led or vocational-led venture creation);
- academic credibility to reinforce notions of the imaginative application of new knowledge and its contribution to society;
- availability of human capital for developing an organization whilst enabling long-term sustainability;

- structural embeddedness to institutionalize the chosen organization, creating greater levels of formalization;
- context and infrastructure to synchronize the infrastructure base of the institution to meet the demands of the educational activity;
- alignment with institutional strategy and policy, and funding policy and financial sustainability; and
- community engagement which designs and offers HEI activities and programmes that meet its aspiration of investing in its local community whilst achieving value locally.

In terms of learning environment, the KVAL initiative departs from the conventional focus of enterprise education (including new venture management, development of business plans, business growth and innovation) in order to consider an understanding of the way that entrepreneurs live and learn (Gibb, 2002b). This broader concept places strong emphasis on the pedagogical and organizational processes necessary to support entrepreneurial competency across a range of different disciplinary and multidisciplinary contexts (see, for example, Volkmann 2004; Politis 2005; Roman *et al*, 2008). Gibb *et al* (2009) provided three perspectives on creating a conducive entrepreneurship learning environment: first, seeking to stimulate entrepreneurial behaviour and enhancing the ability to cope with uncertainty and complexity; second, designing environments and organizations to facilitate and promote 'effective' entrepreneurial behaviour; and, third, self-determination to create and enjoy their own entrepreneurial environment enriched with uncertainty and complexity. The KVAL initiative recognizes these facets of the learning environment for developing educational and training programmes that stimulate creative thinking processes in would-be graduate entrepreneurs, foster entrepreneurship and introduce young graduates to early business start-ups. To complement the competency programmes and provide the necessary learning environment that would stimulate critical thinking and the entrepreneurial development process, the KVAL is housed in a modern, off-campus business laboratory. In operational terms, the KVAL is linked to all six Colleges (faculties) and the 80 departments within these, thus offering both staff and students the opportunity to take advantage of the available facilities and services as well as proactive participation in the development of the KVAL.

Conclusions

The increasing global campaign to boost the level of graduate entrepreneurial activities, coupled with the drive of the Government of Ghana to significantly reduce unemployment rates, requires the creation and implementation of strategic graduate entrepreneurship programmes. The establishment of the KVAL could, it is argued, bring significant benefits to the university, Ghana and the entire sub-Saharan region of Africa. If successful, this could potentially increase levels of job creation and boost early stage business start-ups and the creation of spin-off companies. In terms of its design and practice, the KVAL concept is shaped by a number of distinct conceptual and philosophical issues, including design philosophy, institutional strategy and practice and the learning environment. Key measures of success of the KVAL will be its ability to attract talented and energetic graduates with innovative ideas and intellectual property to the laboratory and help them to create and grow their innovative projects and businesses. The KVAL proactively sets out to help accelerate the growth of early-stage ideas and businesses into venture-ready companies by facilitating the birth and growth of small businesses with the provision of the necessary resources such as management consultancy, mentors, infrastructure support, social networks and seed finance. It provides talented graduates with the opportunity to apply knowledge and expertise to important problems facing businesses, industry and the country. The KVAL creates interdisciplinary linkages with and collaboration between academic departments, industry and other business institutions. It achieves this by attracting the best talents into the laboratory for transformational and self-actualization workshops dealing with business innovations, entrepreneurship development and new venture creation. Based on its criteria and inspired by the paradigm of lifelong learning, graduates from the KVAL will be able to pursue professional development pathways: for instance, from Associate to Professional Member and, ultimately, to Fellow Member. It is to be hoped that KVAL alumni will subsequently provide support services to the laboratory, as resource persons, mentors and role models.

Limitations

It is acknowledged that, by design, this study does not provide validation of the KVAL framework and that a future longitudinal study should be commenced to test the validity and impact of the KVAL approach.

References

Adda, E., and Hinson, R. (2006), 'Exploring the legal framework for business and ethical practices in Ghana', *Journal of Legal Ethical and Regulatory Issues*, Vol 9, No 2, pp 69–80.

Redefining entrepreneurial learning: the Ghana experience

Aerts, K., Matthyssens, P., and Vandenbempt, K. (2007), 'Critical role and screening practices of European business incubators', *Technovation*, Vol 27, No 1, pp 254–267.

Alsos, G.A., Hytti, U., and Ljunggren, E. (2011), 'Stakeholder theory approach to technology Incubators', *International Journal of Entrepreneurial Behaviour and Research*, Vol 17, No 6, pp 607–625.

Amidon, D., Formica, P., and Mercier-Laurent, E. (2005), *Knowledge Economics: Emerging Principles, Practices and Policies*, Tartu University Press, Tartu.

Andersen, B., Howells, J., Hull, R., Miles, I., and Roberts, J. (2000), *Knowledge and Innovation in the Service Economy*, Edward Elgar, Cheltenham.

Andersson, T., Curley, M.G., and Formica, P. (2009), *Knowledge-Driven Entrepreneurship: The Key to Social and Economic Transformation*, Springer, New York and Berlin.

Apgar, D. (2006), *Risk Intelligence: Learning to Manage What We Don't Know*, Harvard Business School Press, Boston, MA.

Bechard, J.P., and Toulouse, J.M. (1998), 'Validation of a didactic model for the analysis of training objectives in entrepreneurship', *Journal of Business Venturing*, Vol 13, No 4, pp 317–332.

Caird, S. (1992), 'Problems with the identification of enterprise competencies and the implications for assessment and development', *Management and Education Development*, Vol 23, No 1, pp 6–17.

Charney, A.H., and Libecap, G.D. (2003), The contribution of entrepreneurship education: an analysis of the Berger Program', *International Journal of Entrepreneurship Education*, Vol 1, No 3, pp 385–417.

Chrisman, J.J., and McMullan, W.E., (2004), 'Outsider assistance as a knowledge resource for new venture survival', *Journal of Small Business Management*, Vol 42, No 3, pp 229–244.

Colombo, M.G., and Delmastro, M. (2002), 'How effective are technology incubators? – evidence from Italy', *Research Policy*, Vol 31, No 7, pp 1103–1122.

CSES (2002), 'Benchmarking of business incubators', *final report to the European Commission Enterprise Directorate*, Centre for Strategy and Evaluation Services, Sevenoaks.

Curley, M.G., and Formica, P. (2010), 'Accelerating venture creation and building on mutual strengths in experimental business labs', *Industry and Higher Education*, Vol 24, No 1, pp 7–10.

Dainty, A.R.J. (2007), 'A call for methodological pluralism in built environment research', in Egbu, C.O., and Tong, M.K.L., eds, *Proceedings of 3rd Scottish Conference for Postgraduate Researchers in the Built and Natural Environment*, Glasgow Caledonian University, Glasgow, 20–22 November, pp 1–10.

Davies, H. (2002), *A Review of Enterprise and the Economy in Education*, HM Treasury, London.

Dwerryhouse, R. (2001), 'Real work in the 16–19 curriculum: AVCE Business and Young Enterprise', *Education + Training*, Vol 43, No 3, pp 153–161.

Doni-Kwame, E. (2007), *Nepad Business and Investment Guide, Corporate Africa: Ghana's Business Environment*, Vol 3, No 1, p 4.

Draycott, M., and Rae, D. (2010), 'Enterprise education in schools and the role of competency Frameworks', *International Journal of Entrepreneurial Behaviour and Research*, Vol 17, No 2, pp 127–145.

Drucker, P.F. (2001), *Innovation and Entrepreneurship*, Butterworth-Heinemann, Oxford.

Dzisi, S. (2009), *Women Entrepreneurs in Small and Medium Enterprises (MSE) in Ghana: A Study of Women Entrepreneurs in a Developing Economy*, Lambert Academic Publishing, Accra.

Financial Times (2011), 'Ghana venture capital fund launches US$100 M angel fund', *Business and Financial Times Magazine*, 27 April 27, available online at: http://www.thebftonline.com, last accessed September 2011.

Gelderen, M.V., Van Der Sluis, L., and Jansen, P. (2007), 'Learning opportunities and learning behaviours of small business starters: relations with goal achievement, skill development and satisfaction', *Small Business Economics*, Vol 25, No 1, pp 97–108.

Gibb, A.A. (2010), 'Concepts into practice: meeting the challenge of development of entrepreneurship educators around an innovative paradigm: the case of the international entrepreneurship educators' programme (IEEP)', *International Journal of Entrepreneurial Behaviour and Research*, Vol 17, No 2, pp 146–165.

Gibb, A.A. (2002a), 'In pursuit of a new entrepreneurship paradigm for learning: creative destruction, new values, new ways of doing things and new combinations of knowledge', *International Journal of Management Reviews*, Vol 4, No 3, pp 233–269.

Gibb, A.A. (2002b), Creating conducive environments for learning and entrepreneurship: living with, dealing with, creating and enjoying uncertainty and complexity', *Industry and Higher Education*, Vol 16, No 6, p 135–147.

Gibb, A.A. (1997), 'Small firms' training and competitiveness: building on the small business as a learning organisation', *International Small Business Journal*, Vol 15, No 3, pp 13–29.

Gibb, A.A., Haskins, G., and Robertson, I. (2009), 'Leading the entrepreneurial university', *NCGE Policy Paper*, October, National Council for Graduate Entrepreneurship, Birmingham, available online at: http://www.ncee.org.uk/publication/leading_the_entrepreneurial_university.pdf, last accessed March 2012.

Gibb, A.A., and Hannon, P. (2007), 'Towards the entrepreneurial university', *International Journal of Entrepreneurship Education*, Vol 4, pp 73–110.

Gottlieb, E., and Ross, J.A. (1997), 'Made not born: HBS courses and entrepreneurial management', *Harvard Business School Bulletin*, Vol 73, pp 41–45.

Greene, F.J. and Saridakis, G. (2007), 'Understanding the factors influencing graduate entrepreneurship', *Research Report 001/2007*, National Council for Graduate Entrepreneurship, Birmingham.

Grey, G.A., Alsos, A., Hytti, U., and Ljunggren, E., (2011), 'Stakeholder theory approach to technology incubators', *International Journal of Entrepreneurial Behaviour & Research*, Vol 17, No 6, pp 607–625.

Gstraunthaler, T. (2010), 'The business of business incubators: an institutional analysis – evidence from Lithuania', *Baltic Journal of Management*, Vol 5, No 3, pp 397–421.

Hannon, P.D. (2005), 'Incubation policy and practice: building practitioner and professional capability', *Journal of Small Business and Enterprise Development*, Vol 12, No 1, pp 57–75.

Hannon, P., and Chaplin, P. (2003), 'Are incubators good for business? – understanding incubation practice: the challenge for policy', *Environment and Planning C: Government and Policy*, Vol 21, No 6, pp 861–881.

Hannon, P., Scott, J., Sursani, S., and Millman, C. (2007), 'The state of education provision for enterprise and entrepreneurship: a mapping study of England's HEIs', *International Journal of Entrepreneurship Education*, Vol 4, pp 41–72.

Harrison, R., and Leitch, C. (2010), 'Voodoo institution or entrepreneurial university? – spin-off companies, the entrepreneurial system and regional development in the UK', *Regional Studies*, Vol 44, No 9, pp 1241–1262.

Hegarty, C., and Jones, C. (2008), 'Graduate entrepreneurship: more than child's play', *Education + Training*, Vol 50, No 7, pp 626–637.

Huovinen, J., and Tihula, S. (2008), 'Entrepreneurial learning in the context of portfolio entrepreneurship', *International Journal of Entrepreneurial Behaviour and Research*, Vol 14, No 3, pp 152–171.

Illeris, K. (2007), *How We Learn: Learning and Non-learning in School and Beyond*, Routledge, London.

Jack, S., and Anderson, A. (1999), 'Entrepreneurship education within the enterprise culture: producing reflective practitioners', *International Journal of Entrepreneurial Behaviour and Research*, Vol 5, No 3, pp 110–122.

Jacob, M., Lundqvist, M., and Hellsmark, H. (2003), 'Entrepreneurial transformations in the Swedish university system: the case of Chalmers University of Technology', *Research Policy*, Vol 32, No 9, pp 1555–1568.

Jarvis, P. (2006), *Towards a Comprehensive Theory of Human Learning*, Routledge, London.

Kharbanda, V.P. (2011), 'Academician to entrepreneur: impact of globalization on science and technology policies in China and India', *Journal of Science and Technology Policy in China*, Vol 2, No 1, pp 7–26.

King, K., and McGrath, S. (1999), 'Enterprise in Africa: new contexts, renewed challenges', in King, K., and McGrath, S., eds, *Enterprise in Africa: Between Poverty and Growth*, IT Publications, London.

Kirby, D. (2002), 'Entrepreneurship education: can business schools meet the challenge?' *paper presented at RENT XV1 Conference*, 21–22 November, Barcelona.

Kourilsky, M.L. (1995), *Entrepreneurship Education: Opportunity in Search of Curriculum*, Center for Entrepreneurial Leadership, Ewing Marion Kauffman Foundation, Kansas City, MO.

Kristensen, B. (1999), 'The entrepreneurial university as a learning university', *Higher Education In Europe*, Vol 24, No 1, pp 35–46.

Krueger, N.F. (2009), *The Micro-foundations of Entrepreneurial Learning and Education: The Experiential Essence of Entrepreneurial Cognition & Implications for Entrepreneurial Pedagogies*, Proceedings of USASBE Conference, available online at: http://usasbe.org/knowledge/proceedings/proceedingsDocs/2009/PaperID125.pdf, last accessed September 2011.

Krueger, N.F. (2007), 'What lies beneath? – the experiential essence of entrepreneurial thinking', *Entrepreneurship Theory & Practice*, Vol 31, No 1, pp 123–138.

Krueger, N.F. (2003), 'Thinking Entrepreneurially: entrepreneurial cognition', in Acs, Z., ed, *International Handbook of Entrepreneurship*, Edward Elgar, Cheltenham.

Krueger, N.F., and Hamilton, D. (1996), 'Constructivism and entrepreneurship education, in Monroy, T., Reichert, J., and Hoy, F., eds, *The Art and Science of Entrepreneurship Education*, Vol 3, No 1, pp 11–21.

Lalkaka, R. (2003), 'Business incubators in developing countries: characteristics and performance', *International Journal of Entrepreneurship and Innovation Management*, Vol 3, No 1, pp 31–55.

Leitch, C., and Harrison, R. (1999), 'A process model for entrepreneurship education and development', *International Journal of Entrepreneurial Behaviour and Research*, Vol 5, No 3, pp 83–89.

Levy, Y., and Ellis, T.J. (2006), 'A systems approach to conduct an effective literature review in support of information systems research', *Informing Science Journal*, Vol 9, No 1, pp 181–212.

Liu, Y. (2012), 'Does the entrepreneurial university really exist in China? – a case from Hua Zhong University of Science and Technology', *Journal of Knowledge-Based Innovation in China*, Vol 4, No 2 pp 1–17.

Lourenco, F., and Jones, O. (2006), 'Learning paradigms in entrepreneurship education: comparing the traditional and enterprise Modes', in *NGCE Working Paper 027/2006*, National Council for Graduate Entrepreneurship, Birmingham.

Matlay, H. (2008), 'The impact of entrepreneurship education on entrepreneurial outcomes', *Journal of Small Business and Enterprise Development*, Vol 15, No 2, pp 382–396.

Matlay, H. (2005a), 'Entrepreneurship education in UK business schools: conceptual, contextual and policy considerations', *Journal of Small Business and Enterprise Development*, Vol 12, No 4, pp 627–643.

Matlay, H. (2005b), 'Researching entrepreneurship and education, part 1: what is entrepreneurship and does it matter?', *Education + Training*, Vol 47, No 8/9, pp 665–677.

McAdam, M., and Marlow, S. (2008), 'A preliminary investigation into networking activities within the university incubator', *International Journal of Entrepreneurial Behaviour and Research*, Vol 14, No 4, pp 219–241.

McLarty, R. (2003), 'Graduate entrepreneurship: a critical review of problems, issues and personal competencies', *International Journal of Entrepreneurship and Innovation Management*, Vol 3, No 5–6, pp 621–636.

Meira-Soares, V.A., and Amaral, A.M.S.C. (1999), 'The entrepreneurial university: a fine answer to a difficult problem?', *Higher Education in Europe*, Vol 24, No 1, pp 11–21.

Minniti, M., and Bygrave, W. (2001), 'A dynamic model of entrepreneurial learning', *Entrepreneurship: Theory and Practice*, Vol 23, No 4, pp 41–52.

Moreira, A.C., and Martins, S.P.L. (2009), 'CRER: an integrated methodology for the incubation of business ideas in rural communities in Portugal', *Journal of Enterprising Communities: People and Places in the Global Economy*, Vol 3, No 2, pp 176–192.

Murray, G., Cowling, M., Weixi, L., and Kalinowska-Beszczynska, O. (2012), 'Government co-financed "hybrid" venture capital programmes: generalizing developed economy experience and its relevance to emerging nations', *Kauffman International Research and Policy Roundtable, Liverpool*, available online at: www.kauffman.org, last accessed April 2012.

Mukhtar, S., Oakey, R., and Kippling, M. (1999), 'Utilisation of science and technology graduates by the small and medium-sized enterprise sector', *International Journal of Entrepreneurial Behaviour & Research*, Vol 5, No 3, pp 126–143.

Nabi, G., and Holden, R. (2008), 'Graduate entrepreneurship: intentions, education and training, *Education + Training*, Vol 50, No 7, pp 545–551.

Nabi, G., Holden, R., and Walmsley, A. (2006), 'Graduate career-making and business start up: a literature review', *Education + Training*, Vol 48, No 5, pp 373–385.

NYPG (2010), 'National youth policy of Ghana: towards an empowered youth, impacting positively on national development', available online at: http://www.ghana.gov.gh/documents/nypolicy.pdf, last accessed on September 2011.

O'Carroll, M., and Millne, H. (2010), 'Women's international centre for economic development (WICED)', *International Journal of Gender and Entrepreneurship*, Vol 2, No 2, pp 197–204.

Osei-Tutu, E., Badu, E., and Owusu-Manu, D. (2010), 'Exploring corruption practices in public procurement of infrastructural projects in Ghana', *International Journal of Managing Projects in Business*, Vol 3, No 2, pp 236–256.

Pawlowski, K. (2001), 'Towards the entrepreneurial university', *Higher Education in Europe*, Vol 26, No 3, pp 427–436.

Penn, D.W., Angwa, W., Forster, R., Heydon, G., and Richardson, S.J. (1998), 'Learning in smaller organisations', *The Learning Organization*, Vol 5, No 3, pp 128–137.

Perkins, D. (1994), *Smart Schools: From Training Memories to Educating Minds*, Free Press, New York.

Pickernell, D., Packham, G., Jones, P., Miller, C., and Brychan T. (2010), 'Graduate entrepreneurs are different: they access more Resources?', *International Journal of Entrepreneurial Behaviour & Research*, Vol 17, No 2, pp 183–202.

Pittaway, K., and Hannon, P. (2008), 'Institutional strategies for developing enterprise education: a review of some concepts and models', *Journal of Small Business and Enterprise Development*, Vol 15, No 1, pp 202–226.

Redefining entrepreneurial learning: the Ghana experience

Pittaway, L., and Cope, J. (2007), 'Entrepreneurship education: a systematic review of the evidence', *International Small Business Journal*, Vol 25, No 5, pp 479–510.

Politis, D. (2005), 'The process of entrepreneurial learning: a conceptual framework', *Entrepreneurship in Theory and Practice*, Vol 2005, No 1, pp 399–424.

Rae, D. (2006), 'Entrepreneurial learning: a conceptual framework for technology-based enterprise', *Technology Analysis and Strategic Management*, Vol 18, No 1, pp 12–23.

Rae, D. (2000), 'Understanding entrepreneurial learning: a question of how?' *International Journal of Entrepreneurial Behaviour and Research*, Vol 6, No 3, pp 145–159.

Rae, D., and Carswell, M. (2000), 'Using a life-story approach in researching entrepreneurial learning: the development of a conceptual model and its implications in the design of learning experiences', *Education and Training*, Vol 42, No 4/5, pp 220–227.

Rae, D., Martin, L., Antcliff, V., and Hannon, P. (2010), *The 2010 Survey of Enterprise and Entrepreneurship in Higher Education*, National Council for Graduate Entrepreneurship and Institute for Small Business and Entrepreneurship, London.

Roman, S., Cuestas, P.J., and Fenollar, P. (2008), 'An examination of the interrelationships between self-esteem, others' expectations, family support, learning approaches and academic achievement', *Studies in Higher Education*, Vol 33, No 2, pp 127–138.

Siegel, D.S., Wright, M., and Lockett, A. (2007), 'The rise of entrepreneurial activity at universities: organizational and societal implications', *Industrial and Corporate Change*, Vol 16, No 4, pp 489–504.

Smith, S. (2010), 'The story of a university knowledge exchange Actor-network told through the sociology of translation: a case study', *International Journal of Entrepreneurial Behaviour and Research*, Vol 16, No 6, pp 502–516.

Sullivan, R. (2000), 'Entrepreneurial learning and mentoring', *International Journal of Entrepreneurship Behaviour and Research*, Vol 6, No 3, pp 160–175.

Sundbo, J. (2011), 'The service laboratory: a new innovation method', *ICE-Project Working Paper, 2011:01*, Department of Communication, Business and Information Technologies, Roskilde University/Center for Communication, Media and Information Technologies, Aalborg University, Aalborg.

Thompson, J., and Downing, R. (2007), 'The entrepreneur enabler: identifying and supporting those with potential', *Journal of Small Business and Enterprise Development*, Vol 14, No 3, pp 528–544.

Volkmann, C. (2004), 'Entrepreneurial studies in higher education', *Higher Education in Europe*, Vol 29, No 2, pp 177–185.

Watkins-Mathys, L., and Foster, M.J. (2006), 'Entrepreneurship: the missing ingredient in China's hi-tech policy?', *Entrepreneurship and Regional Development*, Vol 18, No 3, pp 249–274.

Warren, L. (2004), 'A systemic approach to entrepreneurial learning: an exploration using storytelling', *Systems Research and Behavioural Science*, Vol 21, No 1, pp 3–16.

Webster, J., and Watson, R.T. (2002), 'Analyzing the past to prepare for the future: writing a literature review', *MIS Quarterly*, Vol 26, No 2, pp 13–23.

Wright, M., Clarysse, B., Mustar, P., and Lockett, A. (2007), *Academic Entrepreneurship in Europe*, Edward Elgar Publishing, Cheltenham.

Zaharia, S.E., and Gibert, E. (2005), 'The entrepreneurial university in the knowledge society', *Higher Education in Europe*, Vol 30, No 1, pp 31–40.