

CONVERGING ENTREPRENEURSHIP EDUCATION WITH BUSINESS INCUBATION: AN EXPLORATION OF THE DEVELOPMENT PROCESS FOR ENTREPRENEURS

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ABSTRACT

The purpose of this paper is to examine the convergence of education with incubation and explore the implications on the development process of entrepreneurs. The research question asks: what is the theoretical influence of formal education on the development of entrepreneurs when it is introduced into an incubator setting?

The presentation of this paper forms the first part of a case study and aims to examine two bodies of literature to explore how the different approaches to entrepreneur development can be usefully drawn together. The paper compares a theoretical model with the current practice of the Entrepreneurship, Commercialisation and Innovation Centre incubation program at the University of Adelaide, Australia and reports upon the practicalities of the integration and draws out implications. A re-drafted conceptual framework is provided that will form the foundation for further development of the case study.

INTRODUCTION

The purpose of this paper is to examine the convergence of education with incubation and explore the implications on the development process of entrepreneurs. The research question asks: what is the theoretical influence of formal education on the development of entrepreneurs when it is introduced into an incubator setting?

The entrepreneur has been identified as being disproportionately more important to the success of a firm than their manager counterparts because of the unique challenges they face (and overcome) when engaging innovation (Ensley, Pearson et al. 2002). At the same time, business incubation is seen as an effective means of educating and supporting high growth, innovative ventures because “[t]he desire for individuals to become an entrepreneur and start a business often exceeds their management capabilities” (Osborne 2000 p125). Therefore, the business incubator is considered an ideal means of imparting knowledge and skills in an environment that is relevant and immediately effective (the individual learns how to be entrepreneurial and is supported while he or she develops the enterprise) and can be considered as one model of entrepreneurship education.

However, there is a lack of consensus, particularly in the higher education environment, about what constitutes a good practice model of entrepreneurship education (Holmgren & From 2005; Matlay & Carey 2007). Further, there are a number of approaches to education which differ in intent and practice (Bérchard & Grégoire 2005). Hindle (2007) suggests that education (at least in the higher education context) should be about philosophy, subject critique and self-critique and this would seem at odds with education that is about solving and overcoming immediate and time pressured challenges and problems associated with new venture formation. A cursory glance at a dictionary definition of the key terms, incubation and education, reveal an underlying difference in meaning that is at the heart of the conflict: to educate is to mentally and morally train while to incubate is to *cause* to develop

(Macquarie Concise Dictionary 1998). In the case of business incubation it is the business that is the focus of development rather than the individual *per se*. These circumstances create the rationale for this study and highlight the need to explore how these two conceptually different approaches to education may interface and be mutually effective.

METHOD

The Entrepreneurship, Commercialisation, and Innovation Centre (ECIC) at The University of Adelaide recently gained control of a business incubator that is used to assist students in developing new business opportunities. Many of the participants in the incubator are concurrently enrolled in a post-graduate program of education in either entrepreneurship or technology commercialisation. This research intends to engage with the ECIC incubation program as an ongoing case study (Yin 1994) that embodies a series of action learning cycles via engaging a community of practitioners (Senge and Scharmer 2001).

The presentation of this paper forms the first part of this case study and aims to examine two bodies of literature to explore how the different approaches to entrepreneur development can be usefully drawn together. The paper will then compare this theoretical model with the current practice of the ECIC incubation program and report upon the practicalities of the integration and the implications of the theoretical model for the incubator tenants and the incubator's performance. Two of the co-authors play key roles in the development of the ECIC incubator and will act as self-referent sources for this first preliminary stage of case study development. In addition, past documents and reports about the incubator and its activities were used as secondary data. The resulting conceptual framework will provide the foundation for further study, theory testing and development for the next cycle of action.

Exploring phenomena in theoretically sparse fields is referred to as an inductive process (Eisenhardt 1989; Gioia & Pitre, 1990; Glaser & Strauss 1967; Lewis & Grimes 1999; Mintzberg 1979; Strauss & Corbin 1990) that moves from empirical data outward toward generalised theory. Yin (1994) makes the point that particular cases can be used to generalize to theory but should not be mistakenly used to generalize to other cases. Yin further notes that a single case can represent a significant contribution to knowledge and theory building when it tests what is considered to be well-formulated theory. This paper seeks to establish a well formulated theoretical base from which to carry out a more intensive case study.

A case study is defined by its in-depth collection and analysis of a range of informing data in order to understand a particular person or circumstance (Leedy & Omrod 2001, p 157). This includes observations, interviews and text based and/or visual documentation. Subsequent actions in this case study research will deal more substantially with the various data collection avenues and the analysis of the data will be compared with the theoretical groundwork outlined in this paper.

In order to progress the case study in a scholarly way, development of a conceptual framework is required to establish the logic and groundwork for the study. Morgan (1983) reinforced the notion that science was a process of interaction and suggested that researchers engaged with a topic by interacting with it through a particular frame of reference. Lewis and Grimes (1999) suggested that theory building was generally conducted in three phases. The first phase laid the groundwork, the second conducted the data analysis and the third engaged with theory building. The development of the conceptual framework is a major step in the research building method to establish the groundwork and frame of reference for the data analysis and is the focus of this paper.

ENTREPRENEURSHIP EDUCATION

Educators world-wide are observing growth and persistent demand from individuals and governments to deliver entrepreneurship education (Atherton 2004; Fayolle 2004; Hytti & O'Gorman 2004; Katz 2003; Klapper 2004; Leffler & Svedberg 2005; Solomon, Duffy & Tarabishy 2002). Some quarters have claimed that everybody, in the dynamics of the contemporary economy, could be an entrepreneur (Casson 2000) or should be exposed to entrepreneurship training and development (Gibb 2002). Governments that identify a link between entrepreneurship and economic imperatives have been forging ahead to formulate policy for educational environments that encourage an entrepreneurial spirit (Stevenson & Lundström 2002). It would seem that many in political, educational and academic circles

have arrived at the conclusion that a nation benefits when its people are more enterprising and/or entrepreneurial.

Entrepreneurship education has been categorised into three types; education 'for', 'through' and 'about' enterprise (Caird 1990; Scott, Rosa & Klandt 1998). Each of these types of education programs, it is claimed, serves a different purpose. Education 'for' entrepreneurship is occupationally oriented toward those seeking to start a business. Education 'through' entrepreneurship aims to increase life skills; such as skills in group work, communication and leadership. Education 'about' entrepreneurship aims to develop awareness and understanding of business and industry (Caird, 1990).

Rasheed (2002) investigated two variations of entrepreneurship education; one that aimed at raising awareness for career purposes and provided skill training, and the other that included classroom-based 'enterprise' activities. The former might be loosely considered as education 'for' entrepreneurship (although it also seems to contain elements of the 'about' category), and the latter might be thought of as education 'through' entrepreneurship. The results were compared with a control group not receiving any form of entrepreneurship education. The findings showed that the classroom-based enterprise activity learning had much the same effect as the awareness-based entrepreneurship education except for two major differences. The group experiencing the education for entrepreneurship in career awareness displayed a gain in achievement motivation while the enterprise activities group, or the education through entrepreneurship group, showed an increase in levels of innovation. The study demonstrates the variation in outcomes that may result from current different entrepreneurship education practices and serves to remind us of the importance of clarity in educational objectives.

Peterman and Kennedy (2003) also drew attention to the wide variety of entrepreneurship programs on offer in the market place and suggested that while positive results may be found from a study of one program it could not be assumed that all programs would have similar results due to variations in content, pedagogy and learning styles. This observation is consistent with Falk and Alberti (2000) who claimed that there was little uniformity in content and approach among courses, and entrepreneurship education research needed further development. This view has also been more recently echoed by Greene, Katz and Johannisson (2004) and Harrison and Leitch (2005). However, it is noted that generally educators have emphasized experiential learning and have aimed to reach a diverse audience (Kuratko 2004).

Verheul et al (2001) claimed that a specific entrepreneurship education that focused on "the promotion of entrepreneurship and stimulating entrepreneurial skills and knowledge" (p. 34) could be distinguished from general education. However, entrepreneurship research literature consistently finds that entrepreneurs in developed countries generally exhibit higher rates of success when they have engaged in higher levels of education generally (Foley & Griffith 1998; Lee 1997; Leffler & Svedberg 2005; Van der Sluis, Van Praag & Vijverberg 2003) and even more so when this education is combined with experience (Scott, Rosa & Klandt 1998). Further, Minniti, Bygrave and Autio (2006) reported a relationship between higher levels of education attainment and start-up business activities among the nations contributing to the Global Entrepreneurship Monitor study. More specifically, Hindle and O'Connor (2005) found in Australia that those business owners with partial or complete higher education seem to more frequently turn start-up business activities into operating young businesses. Therefore, entrepreneurship education in its specific sense may be less effectual in creating business success than ensuring higher levels of education attainment more generally.

Taylor and Plummer (2003) address education and enterprise as a human capital issue in community growth and development. They have suggested that education in the entrepreneurship field "is about equipping people to work within a global sphere of economic activity" and "providing individuals with an understanding of facets of the economy and society they live in, and the processes of change that run through them" (p. 559). They also make a distinction between education and training claiming that the latter is "essentially short-termist, supporting current activities and profit streams, not strategic" (ibid., p. 559).

In sum, entrepreneurship education varies across the spectrum of preparing an individual to start, own and manage a business; providing generic life and work skills; and introducing students to the world of commerce and industry. Further, it would seem that higher levels of general education are more important than specific entrepreneurship education with respect to having more people successfully start and grow a business. In any case, it would seem that entrepreneurship education is inconsistent in

its content, pedagogy and approach. However, some are drawing attention to the significance of entrepreneurship for community growth and development, implying a broader relevance.

The contemporary view about entrepreneurship education is perhaps best summed up by Holmgren and From (2005)

To sum up, the agents of the field agree on the importance of entrepreneurship education. They also agree that they disagree on entrepreneurship education itself. However, they agree that it is something positive that must replace, or be part of, traditional education (p. 383).

Models of Entrepreneurship Education

A study of German speaking countries delivering entrepreneurship education concludes that “[a]bove all, the topic [of entrepreneurship education] needs to be approached and treated in a more interdisciplinary manner...” (Klandt 2004, p. 299). The Klandt study also suggests that “...universities and polytechnics organize events and programs in the field of business formation that vary in type and scale. These are comprised of separate workshops, lecture series, seminar programs, contact possibilities, consultancy, cooperation, and more” (p. 299). Klandt portrays the inconsistencies in approaches to entrepreneurship education and suggests that the choices made by institutions are seemingly largely guided by pragmatism rather than clear and specific design choices.

Collins and Robertson (2003) emphasised the different types of learners and they make the point that entrepreneur students are not the same as non-entrepreneur students. That is, they are suggesting that those who are studying with a clear intent to start a business do not portray the same types of individual characteristics as those who do not hold this clear intent. Furthermore, they add that “entrepreneurial characteristics are not stable but rather dynamic across time and situations” (p. 326). This also suggests that while the same skill and knowledge base may have relevance, the immediacy of application varies and may not be considered important by the non-entrepreneur student until some time in the future, if ever.

Along similar lines Johnson, Craig & Hildebrand (2006) define three different types of student audiences that highlight the different need or focus of an entrepreneurship education. They suggest that there are three types of student audience based upon a different stimulus for entrepreneurship located in the type of opportunity that the venture is based upon. These they describe as:

- Profession-based. These types of entrepreneurs operate typically small organizations that are human resource intensive. They are led by a practitioner. Some examples may be a small engineering consultancy, architectural practice or an accounting practice. The opportunity for the business venture is based upon the expertise of the entrepreneur.
- Industry-based. The types of organizations vary in this conception but the business opportunities for the entrepreneur are grounded in the industry dynamics and ideas or gaps that can be filled within an industry context. The entrepreneur matches his or her skills and knowledge to the opportunity to form the venture.
- Invention-based. Again, the types of organizations may vary but the opportunity is based upon an invention that is introduced into a market or industry. The origin of the opportunity and motivation for the venture is located with the invention itself rather than either the entrepreneur specifically or any perceived gap with an industry. The entrepreneur may or may not be the business manager.

Taking a more integrative and learner-centred approach, Johnston and Watson (2004) outline a learning model that considers four facets of work and learning. These they refer to as:

- Key skills – the skills deemed necessary by employers or in the case of entrepreneurship self-employers
- Personal development – the ‘reflective practices’ of students that consider self-assessment and development which assists in their designing their own learning
- The learning organisation – that suggests students should be resilient to change in jobs and careers, adaptable and attuned to lifelong learning approaches
- Student identity formation – where the student becomes more able to identify with particular roles. In the case of entrepreneurship this may be directed toward identifying with the entrepreneur role although other roles may also be relevant in entrepreneurship.

While this model appears to consider a more extensive list of learning attributes it is also untested within the field of entrepreneurship. However, the model resonates with a more holistic approach of the ‘entrepreneurial’ person and broadens the education model away from narrowly defined content driven models of learning.

Another approach to the learning model is offered by Carayannis, Evans and Hanson (2003) who suggest that a stage model can form the basis of the progress of learning. Their model has five stages specified as follows (p. 758):

- *“Foundation: The creation and reinforcement of “entrepreneurial” values both for the individual and for society as a whole.”*
- *“Awakening: The individual is confronted with entrepreneurship as a viable alternative to other forms of career paths.”*
- *“Specialization: The initial skills necessary for business creation are acquired. The individual identifies himself [or herself] as being entrepreneurial.”*
- *“Creation: The individual moves from knowledge and learning to action. The creation of a company or other valorization (ex. intrapreneurship) of mastered entrepreneurship skills is attained.”*
- *“Maturing: The individual builds upon his [or her] career through knowledge-based development and networking as well as through external validation and valorization of his [or her] chosen career.”*

It is worth noting that the model intends to compensate for cultural differences between nations and attempts to contextualise the approach to entrepreneurship for students and make it relevant to the place within which the entrepreneurship program is being delivered. While this approach would seem conceptually sound, its linear form may not make allowances for the heterogeneity among students with respect to intentions, personal development and held values. The model also seems more aligned with the non-student entrepreneur. While the model has its benefits it also has its limitations.

Another model emerges from the work of Rae (2004) who considered more particularly the creative fields as sites for entrepreneurship. Rae defines entrepreneurial learning as being flanked by three distinct areas and offers a triadic model. First, there is the ‘contextual learning’ which deals with the industry, opportunity and the practical theories of entrepreneurial action within those contexts. Next there is the learning that deals with ‘personal and social emergence’. Here the student deals with the tensions between the current and future identity, the role of the family, identification with roles through engaging in various practice events and the student evolving a narrative to construct their own identity within entrepreneurship. The third area of learning is concerned with the ‘negotiated enterprise’ whereby the student encounters issues of participation and joint enterprise, negotiating meaning, structures and practices, comes to terms with changing roles over time and learns to engage in networks and external relationships.

Rae (2004) argues that the model would be useful in supporting teaching that aims to engage with the non-business student entrepreneur, such as the creative arts student, although it is likely to have relevance and broader application.

A final model is given by Pretorius, Nieman and van Vuuren (2005) that integrates two models of entrepreneurial education designed to achieve entrepreneurial performance (E/P). E/P is considered to be measured through the starting of a new venture. The first model considers education within the constraints of a student’s motivations, entrepreneurial skills and business skills. To this they add a second model that incorporates issues of knowledge transfer, the education facilitator, the use of the business plan and contextualisation issues of the particular program. This more expansive approach to defining a model they claim is more complex but at the same time more comprehensive as it includes elements missing from either of the single models.

INCUBATION

Literature searches on incubation and business incubators reveal that research on the phenomenon is young, mostly explorative and barely twenty five years old (O’Neal, 2005). According to estimates carried out by the European Commission, Enterprise Directorate General, there are over 3,000 business incubators worldwide (European Commission, 2002). The term, ‘Business Incubator’ was derived

from incubators that included hothouses, laboratory ovens for micro-organism cultures, infant cribs and poultry hatcheries. All of which provide a “*protected, controlled environment*” and “*assemble the nutrients, treatments, and stimulation necessary to promote and sustain development.*” (Blakely and Nishikawa 1992 p. 244). In business terms, an incubator is viewed as a physical facility (office space or other industrial or factory space) that assists new business growth by providing the incubator tenants (start-up entrepreneurs) with access to shared equipment, administrative services and business guidance (Allen & McCluskey 1990; Barrow 2001). As contemporary research provides different perspectives of the process of nurturing and assisting new ventures, a flexible definition with regards to incubators is offered by the National Business Incubation Association (NBIA) and stated below.

“Business incubation is a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and offered both in the business incubator and through its network of contacts. A business incubator’s main goal is to produce successful firms that will leave the program financially viable and freestanding”. (NBIA 2007).

It is clear from this description that the focus of incubation is the development of the business and the assumption is that the business owner is already a bone fide entrepreneur.

The Incubation Process

Following a recruitment process, the prospective business incubator tenant is invited to move into an office or other space in the incubator and undergoes – and forms part of - the incubator program or process. After approximately three years the start-up business graduates from the incubator and transitions into the local or regional business environment with the expectation that further expansion will be achieved through improved business turnover and or employee growth (Bell & Smith 2003; Hackett& Dilts 2004). A business incubator can thus be seen as the means by which a suitable, protected environment is created in which businesses can be nurtured to the point that they will have a better chance of survival than if they attempt to establish an innovative new venture without such support.

A common approach in the reviewed literature is to classify incubators into groups representing various incubator stakeholders such as real estate, local councils and universities (Allen and McCluskey 1990; Barrow 2001; Bhabra-Remedios and Cornelius2003; Bøllingtoft and Ulhøi 2005; Hulsink and Elfring 2001; OECD, 1999; Rice and Matthews, 1995).

The industrial or the government incubator relies on local, state or federal funding for set-up and ongoing support; this incubator is often established in economically depressed areas. The drivers are economic development and employment growth (Bhabra-Remedios and Cornelius, 2003).

The University incubator is mostly funded by an often attached to a university or established through faculty-industry collaboration. The drivers are: shareholding, the commercialisation of new ideas and technologies from university based research (Barrow, 2001; Bell and Smith, 2003).

Technology Business Incubator models have become increasingly popular since 1990s onward and most are focussed on the nurturing and developing of of new technologies like ICT and Bio technology (e.g. Chan and Lau, 2005; Lalkaka 2001; Mian, 1997; OECD, 1999; Roper, 1999). Researchers and policy makers assert that technology incubators ‘stimulate’ (rather than ‘educate’)the innovation process by forming links between technology research on one hand and customer needs and market demands on the other (Chan and Lau, 2005; Smilor and Gill 1986; Bell and Smith, 2003; Mian 1997; Roper 1999). Because of this mix of fostering new business development as well as transfer of technology, technology incubators are predominantly found in or in the vicinity of industrial parks and universities. They can serve as the mechanisms to assist and develop student and industry spin-offs and promote research and development, entrepreneurial activity and networking at the same time (Clarysse et al 2005; Mian 1997). In addition, They may instigate projects in collaboration with industry or government (Bell and Smith 2003; Roper 1999).

A CONCEPTUAL FRAMEWORK

Integrating both education and incubation processes and models suggests a two part dynamic entrepreneurial process Each part has a specific functionality whereby education is preparing the

individual with necessary skills and influencing their conceptualisation of the business idea along with their self-identity while the incubation part is engaging with realising the opportunity through the business formation and early stages of operations. While both parts might be considered in a sequence, moving from idea to business realisation, the convergence of education and incubation means they are acting in parallel. Figure 1.0 illustrates the sequential nature and integration of education and incubation as dynamic processes. The model supports the notion of entrepreneurship education being experiential (Kuratko 2004) and that incubation nurtures the business and facilitates the entrepreneurs learning.

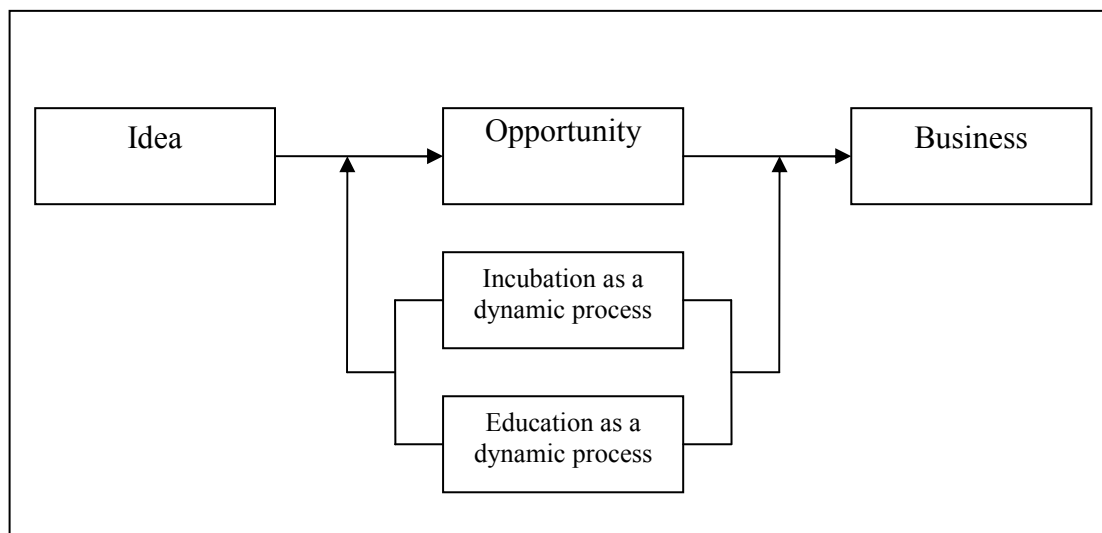


Figure 1.0 Conceptual Framework for Education and Incubation Convergence

The next section outlines the history and operation of the University of Adelaide incubator to show its relevance to, and conformity with this conceptual model. From this point the case study will be used to discuss the practicalities of the integration of entrepreneurship education with incubation and draw out the implications for the incubator tenants and the incubator's performance.

THE ADELAIDE UNIVERSITY INCUBATOR PROGRAM

The Adelaide University Business Incubator has a genesis that is somewhat different from many incubator programs. Incubators have often been set up to assist and encourage the development of new businesses as has been discussed previously. The Adelaide University established the incubator to house students that were enrolled in an experiential based educational program. The program is called the Graduate Entrepreneurial Program and was designed to assist graduating students to start and grow ventures based on their studies or research at University.

The program commenced in 1993 when the students were required to undertake a one year Graduate Diploma program, unless they were PhD students. From 1999 the program was changed to a Masters by coursework. Participants were able to enrol in either a Masters of Entrepreneurship or Masters of Science Technology and Commercialisation. The desired outcomes for the participants included "the commencement of a sustainable self employment venture, development of an entrepreneurial approach to work, and business growth resulting in employment of further people" (McCutcheon 2006). From 2009, the participants will enrol in a Graduate Certificate program. The students, to assist them in achieving the dual aims of commercial success and academic qualification are provided with business-like accommodation at the University's Research Park – Thebarton Campus. The intention is to provide the students a learning environment that includes existing businesses and emerging new ventures.

Key elements of the program include financial support, business mentoring support, and administrative and office support. The participants are thus seen to be engaged in an incubator environment as the administration and office support included business accommodation. As discussed earlier, the mentoring and financial support is akin to typical business incubator programs.

The significant difference between this program and other more typical business incubator programs is the educational focus. The University of Adelaide Business Incubator started life differently to other university based incubators in that it was run through the Office for Industry Liaison rather than the commercialisation arm. Most incubators in universities are specifically set up to assist in the commercialisation of research. This incubator, by comparison was developed to assist in the education of graduates, with only one of the outcomes being a sustainable business. A review of past participants show that 73% of the students continued to operate their business that they commenced in the program.

However, the 'success' rate of continuing businesses is not a prime measure. The greater importance of this program is seen from a wider educational perspective. That is the participants have gained an increased capacity to behave entrepreneurially.

One of the important outcomes has been the identification that the expectations of gaining a Masters qualification in conjunction with starting a business were somewhat unrealistic. Many participants reported that the pressure to study and commence a business concurrently was unsatisfactory. To this end, the program has been reviewed, and the coursework is now a 6 month Graduate Certificate level and the participants are offered a position in the incubator for a further 6 month period after the completion of their qualification if their business idea is judged to be sound and worth developing. This is in recognition that the education and incubation processes are separated by opportunity recognition or discovery as illustrated in the previous model.

The incubator is now managed by the Entrepreneurship, Commercialisation, and Innovation Centre. This provides an opportunity to revisit the process of education and incubation in this unique environment and develop research programs that explore both the learning and business development process contained by this case study.

DISCUSSION

This review of both the education and incubation processes suggests a number of points relevant to the integration of both into one model. This discussion considers how the ECIC program reflects the integration and attempts to draw out further actions that might be relevant in adopting an integrated education-incubation model.

Interdisciplinary Facilitation

The ECIC education-incubation model selects individuals with business ideas to enter into a combined education and incubation process. This learning environment provides the opportunity to apply newly acquired skills directly in an interdisciplinary business environment. The entrepreneur is faced with the day to day running and development of the venture and needs to integrate the learned functional disciplines almost immediately within the context of their own business. This sharpens the experiential nature of entrepreneurship education to the point of 'real life' application that will have meaningful impact upon the learner and their business. Many of the assignments covered by the ECIC education component tend to accommodate the working business and the entrepreneur can use the actual experience of the business to embed into the assignment work and vice versa, the acquired skills and knowledge can be directly applied into the business.

Non-Specific Business Opportunities

Accepting individuals into a program of study who come with a business idea also influences the mix and types of business opportunities that are being incubated. Therefore the types of opportunity, i.e. professional, industry or invention, are not determining factors that are screened at the time of application to the program and the incubator is in turn non-specific about the types of businesses that enter. Thus, the incubator features a range of business opportunities which in turn broadens the type of support services, mentors, industry linkages and networks that are important to the incubator and its tenants. This places added pressure on the incubator services as attempts are made to meet the diverse needs of the incubator tenants.

Personal Development

A key feature of entrepreneurship education is the personal and social development of the participants. This, however, is not a common attribute of an incubator setting. The incubator is more concerned with

facilitating the needs of business establishment and growth and less concerned with the development of the individual. The integration of both education and incubation suggests another level of support service is present that is driven by the education component. To date this attention to the needs of the individual has not been explicit in the ECIC model, however, it is often the case that the educator/mentor roles become intertwined and as an educator the experiences of the entrepreneur are as equally important to the learning process as are the experience of business growth.

A Non-linear Model of Immersive Learning

The Carayannis, Evans and Hanson (2003) learning model that suggests education moves through stages from Foundation to Maturing is not applicable in an integrated education-incubation model. The entrepreneur arrives with the business idea and clear intentionality to establish a business and, therefore, the learning commences at the fourth stage labelled as Creation. This suggests that the triadic learning model of Rae (2004) that places the learner at the centre of personal/social, contextual and negotiated enterprise learning is more applicable in this application. The model therefore is non-linear but instead immersive. Indeed the ECIC model reflects this type of practice although it has been commonly reported that the education component tends to take precedence over the business establishment and growth. It is for this reason that recently the ECIC model altered to reduce the education burden and re-balance the mix in order for the incubator tenants to focus equal attention on both education and incubation activities.

The Fusion of Individual, Learning Environment and Business

The Pretorius, Nieman and van Vuuren (2005) model of education brings into focus the interaction of the individual with the learning environment. The ECIC model takes this further still as it adds the extra dimension of the business itself as an added entity that experiences learning and growth. The starting of a new venture therefore is also no longer applicable as a measure of entrepreneurial performance. Instead, it becomes a matter of what the entrepreneur does with the venture that determines the entrepreneurial performance. The ECIC experience suggests that most ventures entering the program are either infant ideas or are proposed business models that are either untested or have limited innovation. The entrepreneurial performance therefore may have other measures that relate to the development of the individual and the venture idea. Experience also suggests that the ventures change in direction and scope, are proven unviable or are recognised to have limited replicability and growth while only a few become high growth oriented, opportunity focussed businesses.

Incubation models tend to assume the presence of a bona fide entrepreneur while education on the other hand tends to assume the potential of an individual to be an entrepreneur. Incubation assesses the business opportunity while education tends to emerge and develop business opportunity. A convergence of these two models presents a hybrid that is as equally concerned with the development of the individual as the development of the business. Figure 2 presents a re-drafted conceptual model that based upon the discussion reflects a reconsidered relationship between education and incubation. Instead of the two processes working in parallel they instead work in a cyclic fashion where the progress of one informs and feeds the progress of the other. At the heart of the model is the opportunity while education and incubation envelope the opportunity each providing unique inputs into nurturing both the business and the graduate to emerge in a transformed state. It is to understanding the nature of this transformed state the next stage of this case study will be dedicated.

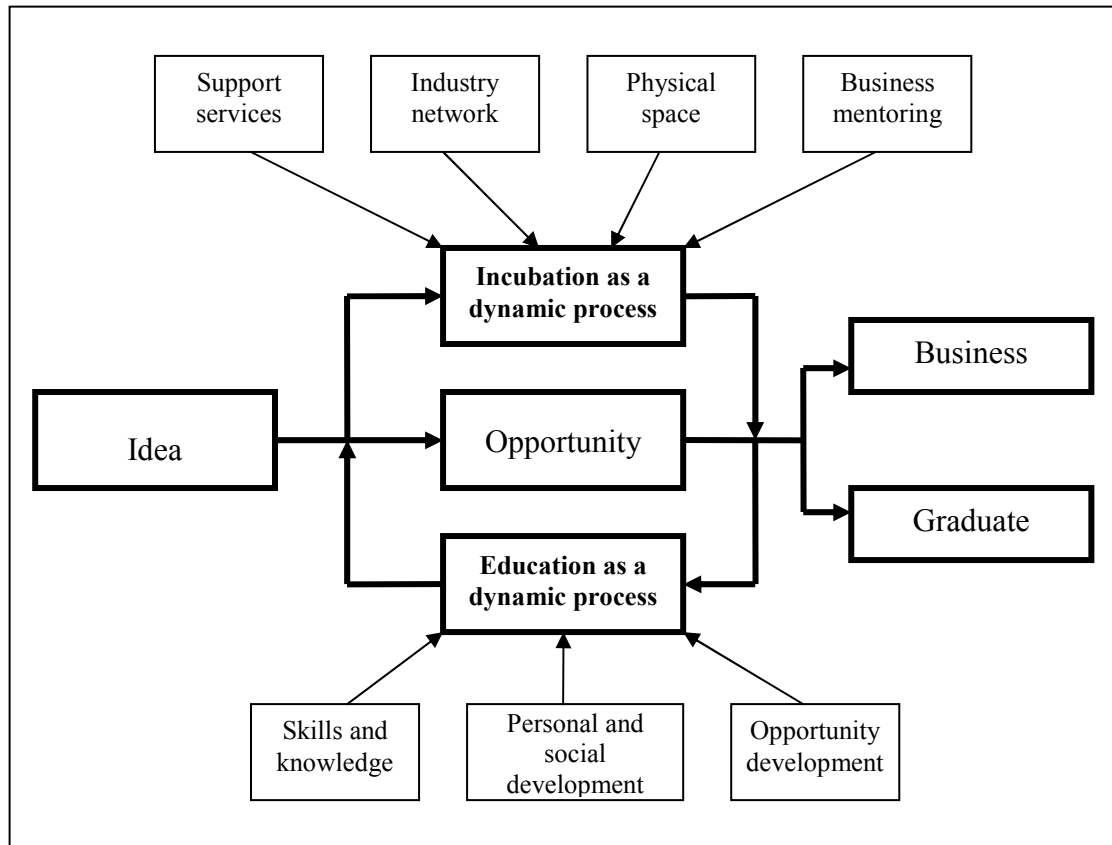


Figure 2.0 A Re-drafted Conceptual Framework

NEXT RESEARCH STEPS

Recognition of the convergence of education and incubation alters the performance expectations of the incubator. Rather than maintaining a pure focus on business start-up and growth, an equal concern is the development of the individual as capable, aware and skilled new venture originator. The environment becomes what might be termed an Enterprise Laboratory where students can experiment with idea development, simulate new venture ideas, test concepts in a supported environment, and gain experience in developing new ventures. It is a place where they can put into practice the concepts developed throughout their formal education. Peer learning, personal and business mentoring support, industry and community engagement are key features of such a laboratory and the performance expectation is associated with successful program graduates irrespective of whether the new venture idea is maintained as an ongoing business.

The next stage of the case study research will be to examine the participant outcomes against this revised and focussed model. Three propositions will be tested. First, that business ideas subjected to this process will have undergone some form of change process as the individuals manipulate the idea in an attempt to establish the concept both as viable in the short term and sustainable over the long term; second, that the graduates themselves will continue to be engaged in entrepreneurial processes whether as an entrepreneur or in some other capacity regardless of the survival of the idea through the education-incubation process; and third that the preparation and critical appraisal of the new venture ideas in the education-incubation model will produce a variety of outcomes that will include a range of entrepreneurial performances and measures applicable to the individual and to the new venture.

CONCLUSION

This research provides a clearer perspective on the development process of entrepreneurs considering the convergence of the education and incubation approaches to entrepreneur development. This assists both educationalists and incubator operators in appreciating the overlap and interplay of the two approaches and how they impact upon the aspiring entrepreneur. The insight presented here shows that an integrated education-incubation model has broader concerns than either model alone. This places

added pressures on the incubation management as it attempts to deal with a diverse set of incubatee's needs that stretches beyond just the frustrations of establishing and growing a business and includes the personal and social development of the entrepreneurs themselves. This implies that incubation managers would also need to develop their own skills and knowledge to cope with this greater portfolio of managerial responsibilities. This paper therefore is useful to both types of entrepreneur development facilities (business incubators and education institutions) to better understand the service provision to their respective incumbents.

The findings inform the next cycle of action by the participants in the case study. The ECIC incubation program is developing a fully functional and integrated learning and practice education environment. Like any innovation or entrepreneurial venture it is feeling its way. This study informs the development of the process and the performance criteria upon which the incubator will be monitored. The next stage of the case study will examine the outcomes of the ECIC education-incubation model and assess these against the resulting re-drafted conceptual framework.

REFERENCES

- Allen, D.N. & McCluskey, R. (1990), Structure, policy, services and performance in the business incubator industry, *Entrepreneurship, Theory and Practice*, Vol. 15, No. 2, pp. 61-77.
- Atherton, A. (2004), Unbundling enterprise and entrepreneurship, *Entrepreneurship and Innovation*, May, pp. 121-127.
- Barrow, C. (2001), *Incubators - A Realist's Guide to the World's New Business Accelerators*, John Wiley & Sons Ltd., Chichester, UK.
- Bell, S. & Smith, F. (2003), 'La Trobe University R&D Park: a case study', refereed paper, XX IASP World Conference on Science and Technology Parks, 1st – 4th June, 2003 - Lisboa, Portugal.
- Béchar, J-P. & Grégoire, D. (2005), 'Entrepreneurship education research revisited: The case of higher education', *Academy of Management Learning and Education*, vol. 4, iss. 1, pp. 22-43.
- Bhabra-Remedios, R.K. & Cornelius, B. (2003), Crack in the Egg: Improving performance measures in business incubator research, refereed paper, 16th SEANZ Conference 28th Sept. – 1st Oct. 2003, University of Ballarat, Vic, Australia.
- Blakely, E. J. & Nishikawa, N. (1992), Incubating High-Technology Firms: State Economic Development Strategies for Biotechnology, *Economic Development Quarterly*, Vol. 6, Iss. 3, pp. 241.
- Bøllingtoft, A. & Ulhøi, J.P. (2005), The networked business incubator-leveraging entrepreneurial agency?, *Journal of Business Venturing*, Vol. 20, No.2, pp. 265-290.
- McCutcheon, A. (2006), Review of the Graduate Entrepreneurial Program. Unpublished Report, April 2006.
- Caird, S. (1990), What does it mean to be enterprising?, *British Journal of Management*, Vol. 1, Iss. 3, pp. 137-145.
- Chan, K.F. & Lau, T. (2005), Assessing technology incubator programs in the science park: the good, the bad and the ugly, *Technovation*, Vol. 25, No. 10, pp.1215-1228.
- Carayannis, E.G., Evans, D. & Hanson, M. (2003), A cross-cultural learning strategy for entrepreneurship education: outline of key concepts and lessons learned from a comparative study of entrepreneurship students in France and the US, *Technovation*, Vol. 23, Iss. 9, pp. 757-771.
- Casson, M. (2000), *Enterprise and Leadership*, Edward Elgar Publishing Ltd, Cheltenham, UK.
- Clarysse, B., Wright, M., Lockett, A., Van der Velde, E. & Vohora, A. (2005) Spinning out new ventures: a Typology of incubation strategies from European research institutions, *Journal of Business venturing*, Vol. 20, pp. 183-216.
- Collins, A. & Robertson, M. (2003), The entrepreneurial summer school as a successful model for teaching enterprise, *Education and Training*, Vol. 45, Iss. 6, pp. 324-330.
- Eisenhardt, K.M. (1989), Building Theories from Case Study Research, *Academy of Management Review*, Vol. 14, Iss. 4, pp. 532-550.

- European Commission, (2002), *Benchmarking of business incubators*, European Commission, Brussels.
- Fayolle, A. (2004), Value Creation in Changing Student State of Mind and Behaviour: New Research Approaches to Measure the Effects of Entrepreneurship Education, viewed 10/1/2005, http://www.kmu.unisg.ch/rencontres/RENC2004/Topics/Fayolle_Renc_2004_Topic_D.pdf.
- Foley, A. & Griffith, B. (1998), Education, training and the promotion of high quality entrepreneurs in the Republic of Ireland, in Scott, M.G., Rosa, P. & Klandt, H., (Eds.) *Educating Entrepreneurs for Wealth Creation*, Ashgate Publishing Ltd, Aldershot, England, pp. 80-93.
- Gibb, A. (2002), In pursuit of a new 'enterprise' and '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, Iss. 3, pp. 233-269.
- Gioia, D.A. & Pitre, E. (1990), Multiparadigm Perspectives on Theory Building, *Academy of Management Review*, Vol. 15, Iss. 4, pp. 584-602.
- Glaser, B.G. & Strauss, A.L. (1967), *The discovery of grounded theory: Strategies for qualitative research*, Aldine, Chicago, USA.
- Hackett, S.M. and Dilts, D.M. (2004), A Systematic Review of Business Incubation Research, *Journal of Technology Transfer*, Vol. 29, No 1, pp.55-82.
- Hindle, K. (2007), Teaching entrepreneurship at university: from the wrong building to the right philosophy, in Fayolle, A (Ed.), *Handbook of Research in Entrepreneurship Education*, Edward Elgar, Cheltenham, UK,
- Hindle, K. & O'Connor, A.J. (2005), *Westpac GEM Australia: A study of Australian entrepreneurship in 2004*, Swinburne University of Technology, Melbourne, Australia.
- Holmgren, C. & From, J. (2005), Taylorism of the mind: entrepreneurship education from a perspective of educational research, *European Educational Research Journal*, Vol. 4, Iss. 4, pp. 382-390.
- Hulsink, W. & Elfring, T. (2001), Much Ado About Nothing? The Role and Contribution of Incubators in Promoting Entrepreneurship and Fostering New Companies. Paper presented at the RENT XV Research in Entrepreneurship and Small Business, Small Business Institute, Turku, Finland.
- Hytti, U. & O'Gorman, C. (2004), What is "enterprise education"? An analysis of the objectives and methods of enterprise education programmes in four countries, *Education + Training*, Vol. 46, Iss. 1, pp. 11-23.
- Johnson, D., Craig, J.B.L. & Hildebrand, R. (2006), 'Entrepreneurship Education: towards a discipline-based framework', *Journal of Management Development*, Vol. 25, Iss. 1, pp. 40-54.
- Johnston, B. & Watson, A. (2004), 'Participation, reflection and integration for business and lifelong learning: Pedagogical challenges of the integrative studies programme at the University of Strathclyde Business School', *Journal of Workplace Learning*, Vol. 16, Iss. 1/2, pp. 53-62.
- Katz, J.A. (2003), The chronology and intellectual trajectory of American Entrepreneurship Education 1876-1999, *Journal of Business Venturing*, Vol. 18, pp. 283-300.
- Klandt, H. (2004), Entrepreneurship Education and Research in German-Speaking Europe, *Academy of Management Learning and Teaching*, Vol. 3, Iss. 3, pp. 293-301.
- Klapper, R. (2004), Government goals and entrepreneurship education - an investigation at a Grande Ecole in France, *Education + Training*, vol. 46, iss. 3, pp. 127-137.
- Kuratko, D.F., (2004), Entrepreneurship education in the 21st Century: From legitimization to leadership, *Coleman Foundation White Paper Series*, USASBE National Conference, January 2004, Dallas, Texas, USA.
- Lalkaka, R. (2001) Best Practices in Business Incubation: Lessons (yet to be) Learnt, Paper presented to Belgian Presidency. Proceeds of the International Conference on Business Centres: 'Actors for economic and Social Development, Brussels, 14-15 November 2001.
- Lee, J. (1997), The motivation of women entrepreneurs in Singapore, *International Journal of Entrepreneurial Behaviour & Research*, Vol. 3, Iss. 2, pp. 93-110.

- Leedy, P.D. & Ormrod, J.E. (2001), *Practical Research: Planning and Design*, Merrill Prentice Hall, New Jersey.
- Leffler, E. & Svedberg, G. (2005), Enterprise Learning: a challenge to education?, *European Educational Research Journal*, Vol. 4, Iss. 3, pp. 219-227.
- Lewis, M.W. & Grimes, A.J. (1999), Metatriangulation: Building Theory from Multiple Paradigms, *Academy of Management Review*, vol. 24, iss. 4, pp. 672-690.
- Macquarie Concise Dictionary* (1998), The Macquarie Library Pty Ltd, New South Wales, Australia.
- Matlay, H. & Carey, C. (2007), Entrepreneurship education in the UK: a longitudinal perspective, *Journal of Small Business and Enterprise Development*, Vol. 14, Iss. 2, pp. 252-263.
- McCutcheon, A. (2006). Review of the Graduate Entrepreneurial Program. Unpublished Report, April 2006
- Mian, S.A., (1997), Assessing and managing the university technology business incubator: an integrative framework, *Journal of Business Venturing*, Vol. 12, pp.251–285.
- Minniti, M., Bygrave, W. & Autio, E. (2006), *Global Entrepreneurship Monitor 2005 Executive Report*, viewed 8 July 2006, http://www.gemconsortium.org/download/1157607424015/GEM_2005_Report.pdf.
- Mintzberg, H. (1979), An emerging Strategy of "Direct" Research, *Administrative Science Quarterly*, Vol. 24, Iss. 4, pp. 582-589.
- Morgan, G. (1983), In research, as in conversation, we meet ourselves, in Morgan, G, (Ed.) *Beyond Method*, Sage, Beverly Hills, California, USA.
- NBIA, (2007), A Comprehensive Guide to Business Incubation, http://www.nbia.org/resource_center/what_is/index.php, last update viewed 21/08/07
- OECD (1999). *Business Incubation- International Case Studies*, OECD Publications, Paris, France.
- Osborne, S. W. (2000), From Unemployed to Entrepreneur: A Case Study in Intervention, *Journal of Developmental Entrepreneurship*, Vol. 5, Iss. 2, p. 115.
- Peterman, N.E. & Kennedy, J. (2003), Enterprise Education: Influencing Students' Perceptions of Entrepreneurship, *Entrepreneurship Theory & Practice*, Vol. 28, Iss. 2, pp. 129-144.
- Pretorius, M., Nieman, G. & van Vuuren, J. (2005), Critical evaluation of two models of entrepreneurial education: An improved model through integration, *International Journal of Educational Management*, Vol. 19, Iss. 5, pp. 413-427.
- Rae, D. (2004), Entrepreneurial learning: a practical model from the creative industries, *Education + Training*, Vol. 46, Iss. 8/9, pp. 492-500.
- Rasheed, H. (2002), Developing Entrepreneurial Characteristics in Youth: The Effects of Education and Enterprise Experience, viewed 24 June 2003, <http://www.coba.usf.edu/departments/management/faculty/rasheed/research.htm>.
- Rice, M.P. and Matthews, J.M., (1995), *Growing new ventures creating new jobs; Principles & practices of successful business incubation*, Quorum, Westport, Connecticut, USA
- Roper, S. (1999), Israel's Technology Incubators: Repeatable Success or Costly Failure, *Regional Studies*, Vol. 33, No 2, pp. 175–184.
- Scott, M., Rosa, P. & Klandt, H. (1998), Educating entrepreneurs for wealth creation, in Scott, M, Rosa, P & Klandt, H (Eds.), *Educating Entrepreneurs for Wealth Creation*, Ashgate Publishing Ltd, Aldershot, England.
- Senge, P. & Scharmer, O. (2001), Community Action Research: Learning as a Community of Practitioners, Consultants and Researchers. In *A Handbook of Action Research*, P Reason, H Bradbury (eds), London: Sage Publications, pp. 238-249.
- Smilor R.W. & Gill M.D. Jr. (1986), *The New Business Incubator: Linking Talent, Technology, Capital, and Know-How*, Free press, NY, USA
- Soloman, G.T., Duffy, S. & Tarabishy, A. (2002), The State of Entrepreneurship Education in the United States: A Nation Wide Survey and Analysis, *International Journal of Entrepreneurship*

Education, Vol. 1, Iss. 1, pp. 1-22.

Stevenson, L. & Lundström, A. (2002), *Entrepreneurship Policy for the Future Series*, Beyond the Rhetoric: Defining entrepreneurship policy and its best practice, Swedish Foundation for Small Business Research, Örebro, Sweden.

Strauss, A. & Corbin, J. (1990), *Basics of Qualitative Research: Grounded theory procedures and techniques*, Sage Publications, California, USA.

Taylor, M. & Plummer, P. (2003), Promoting local economic growth: the role of entrepreneurship and human capital, *Education + Training*, vol. 45, iss. 8/9, pp. 558-563.

Van der Sluis, J., Van Praag M. & Vijverberg, W. (2003), Entrepreneurship Selection and Performance: A Meta-analysis of the Impact of Education in Industrialized Countries, viewed 18 May 2005, <http://www1.fee.uva.nl/scholar/mdw/sluis/VDSLUIPaper.pdf>.

Verheul, I., Wennekers, S., Audretsch, D. & Thurik, R. (2001), *An Eclectic Theory of Entrepreneurship*, Discussion Paper TI2001-030/3, Tinbergen Institute, Amsterdam.

Yin, R.K. (1994), *Case Study Research: Design and Methods*, Sage Publications, Inc., Thousand Oaks, CA.