Graduate entrepreneurs and the tensions faced when developing social capital

Dr Martina Battisti*
New Zealand Centre for SME Research, Massey University
Private Box 756, Wellington, New Zealand
Email: m.battisti@massey.ac.nz

Dr Christof Netzer
Department of Communication in the Professional Field, University of Innsbruck
Schoepfstrasse 3, 6020 Innsbruck, Austria
Email: christof.netzer@uibk.ac.at

Prof Heidi Moeller
Department of Communication in the Professional Field, University of Innsbruck
Schoepfstrasse 3, 6020 Innsbruck, Austria
Email: heidi.moeller@uibk.ac.at

Preferred Stream: Stream 9: Networks, Clusters, Collaboration and Social Capital
Stream 2: Entrepreneurship and Small Business

Profile:

Dr Battisti is working as principal researcher for the New Zealand Centre for Small and Medium Enterprise (SME) Research at Massey University. Prior to joining the New Zealand Centre for SME Research, she worked for four years as a researcher in the Department of Human Resource Management at the University of Applied Sciences Vorarlberg. Her areas of expertise are in corporate citizenship, social capital, HRM, entrepreneurship and SMEs. Dr Battisti has several years of work experience in project management as well as a background in training and consulting.
Graduate entrepreneurs and the tensions faced when developing social capital

ABSTRACT

In recent years, academic incubators have been increasingly recognised as important for transferring academic expertise to private business. In this paper, we explore the areas of tension graduate entrepreneurs are facing. Using a qualitative social network approach, we present results from four case studies of an Austrian academic incubator and its technology oriented start-ups. We argue that in the start-up process, social capital cannot be seen as static. Social capital changes at different stages of the start-up, depending on the resources currently needed. The success of the entrepreneur depends on their ability to identify the changing business needs and to quickly adjust their social networks to the resources required. Due to the persistence forces of social capital, especially young entrepreneurs are facing problems on the relational and cognitive dimensions, such as the conflict between academia and business, and cooperation and competition. Finally, we discuss the results with regard to the management of social capital for entrepreneurs and academic incubators.

Keywords:
Networking, Collaborative advantage, Strategic alliances, Social networks, Reputation, University-Industry-Partnerships

ACADEMIC INCUBATORS

Over 10% of industrial innovation is based on academic research (Mansfield 1998). Although spin-offs can be seen as a traditional mechanism for technology transfer, they are a relatively recent phenomenon in the context of universities, having increased over the last decade (Ho & Wilson 2007). It can, in fact, be interpreted that universities are currently undergoing a revolution, for the second time in their history. The first revolution involved universities expanding their function from their core mission of teaching to research. Now, economic development has become an additional academic function (Etzkowitz 2004). This reflects a fundamental shift from universities as institutions of education and research to ‘important engines of technological development and growth’ (Klofsten & Jones-Evans 2000: 299). As a result, academic incubators are becoming increasingly important as a means of technology transfer from universities to business, as universities increasingly seek to contribute to their region’s economic development in terms of job creation and wealth (Mian 1997). Mansfield (1998) surveyed 153 firms in seven industries spending over US$1 million per year on R&D and found that the time between academic research results and their first commercial introduction in the form of new products and processes decreased in the last 30 years. On average the timeline for the commercialisation of academic research fell from about 7 to about 6 years with the most significant decreases being 4 years for drug and medical products and information processing. The fact that academic research findings are put into commercial use quicker may reflect the closer relationship between academia and business, as well as a change in the nature of academic research towards more applied research.
It is not easy to find a definition of an incubator, as it is an umbrella term for different types of organisations with different goals and thus different priorities. A general definition is provided by Bollingtoft and Ulhoi (2005: 269):

*Incubators seek to maximize the potential of entrepreneurial agency by providing entrepreneurial actors with services and support that complement their existing talents and resources, which in turn is meant to enable them to expand their potential. In other words, incubators can be seen as a planned or deliberate linkage between entrepreneurial agency and the commercialisation process.*

To summarise, the overall aim of an incubator is to leverage entrepreneurial talent by providing a nurturing business environment. By providing various services and assistance, incubators try to overcome the resource gaps start-ups are facing. The first generation of incubators mainly offered conventional support orientated towards the provision of basic resources like office, administration and financial support. But with the aim to accelerate the development and to increase the performance of start-ups, incubators are now challenged to provide ‘value added support (Soetanto & van Greenhuizen 2006: 2). This support includes entrepreneurial courses for enhancing business skills, business mentoring and networking services. Based on the continuum model by Allen and McCluskey (1990), Bollingtoft and Ulhoi (2005) proposed five organisational ideal types of incubators, differing in their purpose, organisational structure, operating policy and institutional affiliation. Within their model an academic incubator aims to transform research and development findings into new products or technologies. As such an academic incubator is mainly interested in ‘development as an end in itself, rather than nurturing entrepreneurial talent, companies, and profits, as is the case of other types of incubators’ (Bollingtoft & Ulhoi, 2005: 271). Harrison and Leitch (2007) concluded that academic spin-offs start small and remain small and that they are not dynamic high-growth start-ups. Lambert (2003) was also sceptical about academic spin-off long term survival. According to Smilor, Gibson and Dietrich (1990), academic incubators focus on three types of spin-offs: first, spin-offs founded to commercially exploit the results of university research; second, spin-offs founded by teaching or research staff of universities; and third, spin-offs founded by students and graduates to commercially exploit the results of research in which they have been involved at university.

Recently, the third type of academic spin-off has gained increased attention where the technological knowledge of highly qualified graduates is commercialised despite limited professional experience. Academic incubators face two main problems: academic staff with stable jobs and established careers are often not sufficiently interested in starting companies (Etzkowitz 2001; Capaldo & Fontes 2001), and if they do, they are not necessarily growth orientated or aware of business development needs, as they focus on technological advance rather than competitive advantage (Caird 1991; Franklin, Wright
& Lockett 2001; Hay, Butt & Kirb 2003; Moroz, Hindle & Anderson 2007; Vohora, Wright & Lockett 2004; Perez & Sanchez 2002). Wirsing et al. (2002) took this point even further by suggesting that most academics actually exhibit a distinct aversion to the risks associated with starting a new venture. Therefore, Capaldo and Fontes (2001) assumed that graduate entrepreneurs at an early stage of their career may have an advantage with regard to motivation, mobility and readiness to dip into an entrepreneurial experience. However, even with this group, a ‘bridging phase’ or ‘pre-incubation’ (Formica 2002) may be necessary in the development process of the spin-off to close the gap between the academic and the entrepreneurial cultures.

Graduate entrepreneurs have rarely been the focus of research into academic spin-offs, which is not surprising given the fact that technological and academic entrepreneurs are on average in their mid 30s (Bollinger, Hope & Utterback 1983; Harvey 1996). In general, 15% of business founders are under the age of 25, but given the fact that founders of high-technology firms have qualifications that are normally not obtained until their mid 20s, this percentage is close to zero for founders of high technology firms. Moreover, founders are more likely to have long professional experience, often serving in high-level staff positions for 12 years or more (Storey & Tetter 1998). During the early stages of a start-up, entrepreneurs frequently lack critical resources that can only be obtained through networks with partners. These relationships seem to be crucially important to gain access to relevant knowledge, support, advice and resources that can not easily obtained elsewhere. This seems to be particularly true for graduate entrepreneurs given their low age at start-up and their short or non existant work experience. Incubators may also act as the link between start-ups and other partners that provide valuable resources and thus perform a bridging function (Hackett & Dilts 2004).

This study reports on graduate entrepreneurs in Austria where 18% of the adult population aged 25-to-64 years are qualified to the tertiary level, well below the OECD average of 26%. A comparatively low level of graduates in Austria study science, 9% as compared with the OECD average of 11% (OECD 2007). Start-up activity in Austria is generally not very dynamic by international standards; this is particularly true for the high-tech sector, which accounts for less than 10% of all new companies. The fact that the number of new companies founded by university graduates and scientists is so small is significant. Evidently, comparatively little of the potential available at research institutions in Austria is being used to start up new businesses. Furthermore, universities tend not to promote self-employment as a career path for graduates and scientists. As a result the AplusB (Academia plus Business) initiative was launched. The thinking behind the programme is to significantly increase the number of innovative and technology-oriented business start-ups from the academic sector in Austria.
SOCIAL CAPITAL

The theory on social capital is based on the assumption ‘that social structure is a kind of capital that can create for certain individuals a competitive advantage in pursuing their ends’ (Burt 2000: 4). Because of this competitive advantage, social capital is widely acknowledged as important for the development of start-ups and business networks. While it is important for entrepreneurs to build up partnerships and network relations, they must make sure that the emerging social structure actually meets their resource needs. Although the structure of the social network may be the same, its social capital may vary depending on the context. The only parts of the social network that can be regarded as social capital are those which provide helpful resources for an actor in achieving an aim (Coleman 1990). For this reason it is important to differentiate between social network and social capital, as this distinguishes structure from function. Thus, social capital during the start-up process needs to be seen dynamically, as the need for resources changes within the different stages of the start-up. As social capital results from interaction and is embedded in relations between different actors it is consequently complex to describe. These relations have been described as formal or informal, strong or weak (Granovetter 1973; 1985), vertical or horizontal (Putnam 1993), bonding or bridging (Woolcock 1998). For the purpose of the present study, the conceptual framework of Nahapiet and Ghoshal (1998) was chosen because it provides a comprehensive, multidimensional conceptualisation of social capital. Nahapiet and Ghoshal (1998) distinguished three dimensions of social capital: a structural, a relational and a cognitive dimension.

The structural dimension refers to the patterns of connections between actors. For start-ups, size and heterogeneity of the network, as well as strength and multiplexity of network relations are key indicators for the structure of their social network. However, empirical evidence is unclear. In a large scale survey, Brueckl and Preisendorfer (1998) found that strong ties were more critical than weak ties in explaining firm success as measured by firm survival, but in a longitudinal comparative case analysis, Maurer and Ebers (2006) found that successful new technology-based firms (NBFs) show a larger and more heterogeneous network and they build up simple weak ties as well as strong multiplex ones. It is indicated that during the founding stage, strong ties may be more relevant in terms of survival, whereas during the growth stage strong ties may negatively affect innovation. In the growth phase, weak ties have a higher potential for generating new ideas (Starr & Macmillan 1990; Aldrich, Ben & Woodward 1987). But as most of the academic spin-offs are technology oriented, networks are more important for them because implicit and tacit knowledge is necessary to keep competitive advantage (Witt 2004).

The relational dimension of social capital consists of trust, norms and obligations and they can be seen as fundamental conditions to build up social capital (Fukuyama 1995; Coleman 1990; Putnam 1995). Without being agreed upon in written form, the relational elements of social capital steer the behaviour
and action of the actors. Social control is, therefore, an important factor for productive social networks and describes an alternative to economic control. For start-ups it is crucial to build up relationships based on mutual trust and shared norms because they usually possess a limited amount of resources and capital. Scientific know-how is a relevant resource for NBFs and Liebeskind, Oliver, Zucker and Brewer (1996) point out that formal market contracts are rarely used to govern these exchanges of scientific knowledge. Instead, the relationships are based on shared professional norms and mutual trust. Anderson and Jack (2002: 202) call it ‘the etiquettes’ of social capital that can both guide and constrain the process of social capital development.

The cognitive dimension of social capital refers to the mental model of an actor and consists of his or her cognitive schemes and systems of meaning (Nahapiet & Ghoshal 1998). Depending on the mental model, perception and interpretation of social patterns are different. Knowledge regarding the aim, motive, history or norms of a group is important in order for someone to judge what is going on in a group and to adapt their own actions accordingly. Mental models work as a kind of self-referential knowledge that manages individuals’ activities in order to avoid misunderstandings. Knowledge based work is only possible if the network partners mutually understand each other so that communication works effectively.

Maurer and Ebers (2006) explored how social capital affects firms’ performance in different stages from start-up to business development. They pointed out that firms can realise performance benefits when they are able to change their social network to the resources needed in different stages of the business development. Baron and Markman (2003) agreed that social capital helps entrepreneurs gain access to resources that are important for achieving their business goals. Furthermore, they argue that once such access is gained, the entrepreneurs’ social competence influences the outcomes. However, a major shortcoming is the assumption of a linear causal relation between networking and start-up success, neglecting the costs of networking (Witt 2004).

Social network analysis focuses on the relationship between entrepreneurs and other actors who provide resources to establish and develop the business. These resources are commonly referred to as social capital (Greve & Salaff 2003, Coleman 1990) and research in the field has yielded a number of important findings as described above (Hoang & Antoncic 2003). Social network analysis as a structural approach measures only one element of social capital, its structure. Hoang and Antoncic (2003) concluded that there is a scarcity in process-oriented studies addressing the question of how social capital changes and develops over time. To address this question the emotional and cognitive dimension of social capital needs to be taken into account. Social networks represent only the structural dimension of social capital, but understanding the dynamics of social capital development and the persistent forces in the pattern of social activity requires analysing relational and cognitive elements as well. Quantitative social network data tends to oversimplify network processes. As social
capital is the product of interaction, persistence forces need to be considered as well. Qualitative social network analysis allows the measure of social capital in all its dimensions by capturing the actors’ perceptions of the network in which they are embedded, and by reconstructing these interactions in the particular context (Hollstein & Strauss 2006). This paper contributes to the emerging work that focuses on the development and evolution of social capital during the venture formation process with regard to management capabilities (Anderson & Jack 2002; Ibarra, Kilduff & Tsai 2005; Maurer & Ebers 2006; Totterman & Sten 2005).

RESEARCH DESIGN
The concepts developed in the previous section provided a framework for the analysis of the development and management of social capital in technology orientated start-ups within an academic incubator. The objective of this exploratory study was to contribute to a better understanding of the challenges graduate entrepreneurs within an academic incubator are facing when developing and managing their social capital. Using case study methodology (Yin 1994, Stake 2000) allowed us to gather new insights in the thinly explored field of graduate entrepreneurs in an academic incubator. In order to generate this insight, we matched graduate entrepreneurs with academic entrepreneurs at a later stage in their career (Storey 2000).

Case Selection
For this study, four cases were selected for analysis on the basis of a theoretical sampling procedure (Eisenhardt 1989) with the help of our research partner, the incubator manager. All of the cases were university spin-offs from the same incubator operating in Austria. Three context factors that might have a moderating effect were controlled for: firm age, business sector and firm location. Due to confidentiality agreements, we can offer only rough case descriptions. All of the cases studied were started in the same year by a team of founders; they could be described as technology oriented firms and were located in the same incubator from which they got a comparable form of support. Two of the cases were young or graduate entrepreneurs and two were academic entrepreneurs in a later stage of their career. The two graduate entrepreneur teams were in their mid 20s trying to commercially exploit the research findings from their bachelor theses. Besides being entrepreneurs, both of them were still associated with the university as they were pursuing their masters studies. On average they had three years of work experience, but not related to their specific field, and none of them had received any formal education in business administration. The two matched cases of academic entrepreneurs were in their mid 40s with a substantial academic track record, as well as professional experience in their field of at least five years.
Data Collection and Analysis
Before conducting the case studies, ten expert interviews were made to further specify the research question and to develop a conceptual framework. The interviews followed an unstructured, open approach and aimed to develop an understanding of the context of the academic start-up process and the challenges and problems faced by graduate entrepreneurs. For this reason, experts dealing with different aspects of the start-up process, like incubator managers, business consultants, bank consultants, lawyers and accountants were interviewed. For the case studies we chose to use a qualitative social network approach using problem-centred interviews (Witzel 2000). Qualitative social network analysis captures the actors’ perceptions of the network in which they are embedded and aims to reconstruct these interactions in the particular context. The actors’ perception, their attribution of relevance and finally their interpretation of their social environment governs their actions and strategies (Hollstein & Strauss 2006, Diaz-Bone 2007). Using this approach allowed us to analyse not only the social networks in terms of their structure, but also the norms and obligations and the cognitive schemes of the actors. Data collection consisted of two separate interviews with the entrepreneurs and covered the development of the firm, from founding up to the time of the interview, which covered a period of two years. In order to ensure reliability, the interviews were taped and transcribed. Data analysis followed Strauss and Corbin (1998), which involved systematically trying to explore similarities and differences across the cases with the aim to identify specific patterns of how graduate entrepreneurs developed and managed their social capital (Langley 1999). In order to ensure validity, interpretation was done in a community of researchers and short case descriptions were sent back to the interviewees (Patton 2002).

RESULTS AND DISCUSSION
Challenge of adapting the network structure to changing need
Generally, the two graduate entrepreneurs had smaller networks in the beginning and did not build up as many new relationships within the time period analysed. On the structural level, both entrepreneurial teams showed a similar development. At the time of the start-up, the private network played the most important role in terms of administrative, financial and emotional support. Over the course of the enterprise development those private relationships were constantly transferred to formal relationships with lawyers or accountants and the network as a whole became more differentiated. Two years after the start-up, both teams still showed a small network with few, but intensive relationships. The biggest challenge for both was to build up a customer network, as they were lacking access to customers. In trying to build up a customer network, both teams developed similar strategies: developing relationships with collaboration or distribution partners, attending relevant events such as trade fairs and networking through industry associations. Both teams stressed the relevance of academic partners for the success of the company, but were facing challenges when building up relationships. The teams were not only lacking reputation in the corporate world, but in the academic
world as well. These results demonstrate that in the start-up process, social capital cannot be seen as static. Social capital changes at different stages of the start-up, depending on the resources currently needed. The success of the entrepreneur depends on their ability to identify the changing business needs and to quickly adjust their social networks to the resources required. Adapting the network on a structural level, because of the need to collaborate with different partners, can lead to tensions on the relational and cognitive dimension due to persistence forces of social capital.

The two matched cases of academic entrepreneurs had a far larger network at the time of start-up and built up more relationships in the same time period, especially with customers and collaboration partners. They managed to adjust their network to the challenging business needs more rapidly. This resulted in a more successful business in terms of employee numbers and sales. It is argued that it is not just the lack of reputation the young entrepreneurs faced, but also a lack of management capability.

**Relational tension between trust and contracts**

Both teams were facing the challenge of ‘coopetition’ (Beck 1998), the simultaneous realisation of cooperative and competitive behaviour. ‘Coopetition’ relates not only to relationships in the corporate world, such as with collaboration or distribution partners, but with academic partners as well. Regarding academic partners, the young entrepreneurs experienced a problem with intellectual property rights. Unlike the two cases of the academic entrepreneurs, the two graduate entrepreneurs were lacking reputation. The fact that all of the young entrepreneurs were still in a student-professor relationship with their academic partners may be an important factor. The two academic entrepreneurs were sharing the norm of reciprocity as members of their scientific community. This norm developed through shared socialisation and similar professional careers and backgrounds. The norm of reciprocity also supported trust as a form of social control. On the other hand the young entrepreneurs faced a role conflict. As students they experienced a relationship of dependency to their supervising professors, where they assumed opportunistic behaviour on the side of the professors. At the same time, as entrepreneurs they saw themselves as a collaboration partner, where the relationship was based on mutual exchange and social control was governed by trust. The necessity of collaboration was seen alongside the possibility of opportunistic behaviour of the partner. But if opportunistic behaviour is basically assumed on the side of the partner, it is unlikely that collaborative behaviour will arise in a relationship. The role conflict the young entrepreneurs faced created tensions that were experienced as insecurity and vulnerability. Not only in the academic network, but also in the collaboration network, cooperation faces the possibility of competition. Formal and legal contracts and trust are seen as complementary actions to govern and stabilise relationships. Because of the relatively weak network relations of the young entrepreneurs, trust as a mechanism was relatively fragile. Trust was based on the assumption that the partner does not risk damaging his or her reputation.
Compared to the young entrepreneurs, the academic entrepreneurs displayed a much stronger and robust trust that was based on a shared history and that comprised mutual knowledge of each other, the capability of assessing the partner and being able to see things in the same light. The exchange of knowledge and information as well as access to technology was controlled by the assumption of mutual benefit. Collaboration networks, regardless of being corporate or academic, were the result of a process, where new relationships were built up and old ones were broken, so that the ones that have proven to be trustworthy and stable continued to exist. Again, the two academic entrepreneurs acted more confidently when it came to managing conflicting interests.

**Cognitive tension between academia and business**

As mentioned above, cooperation needs integration on different levels. Cognitive dissonance in terms of different mental schemes can hinder the development of social capital. The criteria of success are different in the academic and corporate worlds. In one area, success is measured by the number and quality of publications, in the other it is about growth and turnover. From a cognitive point of view the two young entrepreneur teams seemed to wander in both worlds. The start-up was based on a product that was scientifically developed during their bachelor theses. All of the founders still worked as scientists within their masters studies where they were developing their product further. Thus, they saw themselves confronted with two different criteria for assessment. As students, the scientific value of their product was measured; as entrepreneurs, the economic value. This was an area of tension, and it seemed to differ between individuals as to which self-image outweighed the other. In the two years since start-up, one founder from each team decided to go back to academia and left the business. The remaining founders presented themselves clearly as entrepreneurs as shown by their self-image and their cognitive schemes, but this seemed to be a persistence force in the development of collaborative relationships with academic partners. The young entrepreneurs saw the differences in how they defined themselves and their work, the differing interests and criteria of assessment as a barrier for collaboration and partnership, not as a resource for innovation. Too much consensus bears the danger of a cognitive lock-in that blocks innovation and produces inertia. But in contrast to the relational and structural dimension of social capital, the cognitive dimension is mostly unconscious and the schemes intensify over time. Adaptation of the network on a structural level is thus connected to the challenge for a person to open up and change their own cognitive schemes. Especially if the aim is to develop a more heterogeneous network, the capability of integrating different mental models is of high relevance. Noteboom (2001: 189) regarded the aim in a ‘cognitive distance: sufficient proximity in understanding to communicate, but sufficient distance to generate the surprise of novelty’.

Both older academic entrepreneurs not only had several years of experience with business partners through intense collaboration but had worked in the corporate world for several years. While one saw himself more as an academic, the other one saw himself more as an entrepreneur. However, they both
integrated the seemingly contradictory characteristics of both cultures and transformed them into complementary parts of an integral whole towards collaborative partnerships.

**IMPLICATIONS FOR FURTHER RESEARCH AND PRACTICE**

In order to increase the significance of this exploratory research we now aim to undertake more case studies to give consideration to graduate entrepreneurs as a very heterogeneous group. Moreover, it is aimed to develop a coaching concept incubators can use to assist the young entrepreneurs in the development and management of social capital. All of the entrepreneurs agreed that networks were crucial for their development and success. The feedback showed that the network analysis methodology had met the entrepreneurs’ interest. The process of the network analysis and especially the network charts not only gave the entrepreneurs a good impression of the development of their social network and the relevance and centrality of single network partners, but also revealed structural weaknesses as well. The analysis of the network relations was seen as an effective way to improve their rather limited insight into the actual constituents of their networks. In this context it seems to be important to develop an instrument that allows easy analysis of the social network and the relevance of network relations. Network diagrams or sociograms were seen as valuable for this purpose. Within coaching sessions the entrepreneurs can analyse their network regularly in terms of strengths and weaknesses. But as a more important part than the structural analysis of the network, a reflection on the self and others’ conception was revealed. The ability to connect up to strategically important network partners is a critical managerial skill (Baron & Markmann 2003; Bollingtoft & Ulhoi 2005) and from the results of this study, we assume that communication skills, the ability to perceive others and the ability to stand cognitive tensions in order to use them constructively for cooperative action are also crucial. In the transition from being a graduate to being an entrepreneur it appears necessary to reflect on the self and others’ conception and to rebalance and expand the different cognitive patterns. Realising differences may lead to cognitive and emotional tensions, but learning to withstand these tensions by respecting both similarities and differences and trying to integrate them into complementary parts of an integral whole is seen as an important development process. Alongside the implementation of the coaching concept, an evaluation model is suggested where the development of social capital is compared between firms who took part in the coaching and firms who did not by using a matching approach (Storey 2000). This approach would allow its impact to actually be measured.
REFERENCES


Hay D, Butt F & Kirby D (2003) Academics as entrepreneurs at a UK University, in Williams G (Ed) *The Enterprising University, Reform, Excellence and Equity*: 132-142. SRHE and Open University Press, Buckingham, UK.


