Editorial: Poles of innovative entrepreneurship: a triple nexus

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1 Introduction

Why is innovative entrepreneurship important? Following the Schumpeterian theory, Drucker (1985) considers entrepreneurship 'an act of pure innovation' contrary to the notion of a mere creation of new firms. After the work of Romer (1986) for the endogenous economic growth and the *knowledge-driven economy*, innovation has become a relatively 'new' measure for entrepreneurship reported by GEM. Grounded on economic geography, Audretsch and associates (e.g., Audretsch and Keilbach, 2008) developed the theory of knowledge spillover which explains innovation clusters of SMEs as a paradigm of knowledge intensive entrepreneurship which induces economic growth. Furthermore, innovation is also important for large companies which deploy absorptive

capacity as to effectively cope with technological changes in the market (Cohen and Levinthal, 1990; Zahra and George, 2002). The contemporary effort of companies to pursue *open innovation* organisational models (Chesbrough, 2003), indicates that much innovation can occur inside or outside a venture and can be exchanged in pieces. Innovation is also important in the social context (Phills et al., 2008). Social innovation aims to provide persistent solutions to social problems independently of the persons (i.e., innovators) involved. As a concept, it shares values and objectives with social entrepreneurship but in a less person-centric framework. Apparently, a contemporary demand for innovation inherently appears in Western, knowledge-driven economies which prefix technology as a means for economic growth.

Innovation is currently considered quadruple. The latest Oslo manual (OECD, 2005) incorporates *marketing* and *organisational* forms of innovation beyond its traditional *product/service* and *process* types. In this fashion, innovation now 'exceeds' the purely confined by technology domain by acquiring a recognised humanistic component. In parallel, the remarkable spread of *social* innovation dissociates innovation from the ordinary market processes. Thus, contemporary 'new combinations' of J. Schumpeter can emerge from accumulated knowledge of all disciplines. Such a pattern induces a 're'-consideration for many of the certain aspects of innovation and innovation potential.

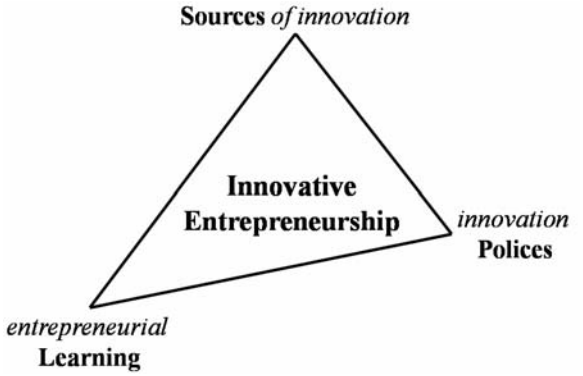
Within large corporations, innovating for new product and process development is found a complex activity, difficult to handle. Such holistic and chaotic situations pertain to innovation management and are known as the front end of innovation (cf. Khurana and Rosenthal, 1998) or the 'fuzzy front end'. Koen et al. (2001, p.47) schematise the fuzzy front end into an 'engine' which incorporates main parts of entrepreneurial opportunity identification and elaboration in the technological context. In contrast, smaller firms appear more efficient to undertake risks associated with innovations. Thus, they are able to intervene between sources of knowledge (universities, research institutes, etc.) and large firms as to catalyse the innovative product development function. However, innovation may also emerge from *collaborative innovation networks* in the outside of companies (Gloor, 2006). Therefore, sources of innovation become a modern subject of research as the 'innovator' is hardly an individual in accordance to the early Schumpeterian description.

Another aspect of ongoing research is how public agencies encourage innovation. Once innovation is perceived as a motor for economic growth, and/or social change and development, relevant policies are crucial for the adoption of innovation and for the elevation of the innovation potential. Thurow (2003) notes that: the establishment of the technology sector of industries marks the development of an economy. However, it is more competitive and risky. Hence, it finally becomes a societal decision to support 'technological entrepreneurs' because failure is more likely for those who compete with the uncertainty of new markets. The willingness to develop technology is reflected in relevant policies that apply to a region along with the regulations for the globe. Experimentation and learning from failure are key issues for innovating firms, thus, learning enters the research in entrepreneurship as an inherent attribute of effective manipulation of new combinations. Cope (2005) suggests the development of a 'learning lens' in order to examine entrepreneurship as a learning process. Moreover, nowadays, students from all disciplines can follow entrepreneurship courses in which they are introduced in main concepts and methods of innovative entrepreneurship in order to succeed in a rapidly changing socio-economic environment.

2 Innovation sources, policies and learning: a triple nexus

We consider sources of innovation, policies and learning as three distinct poles of innovation research. These poles are not expected to form a continuum since they are interrelated. Each pole can be hardly considered isolated as it presupposes the existence and the content of the other two. Hence, we schematise the innovative entrepreneurship nexus shown in Figure 1. Particular alterations in policies, learning or sources of innovation induce a systemic change in the nexus.

Figure 1 A nexus for innovative entrepreneurship



Note: Various sources of innovation, innovation policies and entrepreneurial learning are certain poles to maintain innovative business venturing.

Let us consider innovation policies. They may originate from general societal perspectives as, for instance, regional development, national economic growth or empowerment of competitiveness, etc.; however, they refer to concrete routes for innovation and they are connected with *what is learnt* from previous policies, implementations, good practices or ongoing research. On the other hand, many sources of innovation are policy-dependent. For example, public funds available to innovating firms or institutes prioritise industrial sectors of interest. Copyright laws, patents and their implementation are also crucial for many intellectual or laboratory innovations. They are also important for the procedures of open innovation. Furthermore, financial or trade regulations supported by the law are fundamental for the establishment of innovating industries. Finally, the general legislation and corresponding socio-economic conditions motivate the majority of social innovation. Many examples could be drawn to illustrate the previous relations and many of them pertain to business ethics. Moreover, due to rapid changes in either technology or the market, entrepreneurial learning also relates to policies. Innovating entrepreneurs learn how to cope with new policies and regulations. Many entrepreneurial associations also provide experience in policy-making by cooperating with the government. Overall, innovation policies emerge from and counteract on technological evolution and entrepreneurial practice.

Entrepreneurial learning is experiential and informal in everyday business venturing (e.g., Minniti and Bygrave, 2001; Politis, 2005) but also contextualises the systematic provision of entrepreneurship education. The latter is often connected to innovation especially in engineering and science departments. Due to recent educational policies,

entrepreneurship education spreads rapidly in higher education. The expected goals for this type of education can vary between the academic community and the governmental agencies. Nonetheless, an emerging need for innovative entrepreneurship education is to reveal its interdisciplinary content in accordance with the definitions of the latest Oslo manual (OECD, 2005). Hence, entrepreneurial learning and education have to scrutinise various modern sources and innovation processes as well as to exploit underlying legislation and suggest effective policies for both business and social innovation.

Sources of innovation have increased in modern knowledge-driven economies (OECD, 2005). Marketing and organisational forms of innovation appear inclusive for many non-technological innovation sources. Knowledge from humanities, arts or social sciences can equally be exploited to extend the Schumpeterian notion of 'new combinations'. Much service innovation, for instance, rests on human potential and behaviour. Idiosyncratic creativity, another certain source of innovation arising from the schools of arts, should not be considered as too 'abstract' as it traditionally provides lucrative businesses in the market. Moreover, social networking has changed the landscape of human communication. Swarm creativity (Gloor, 2006) is nowadays possible within collaborative innovation networks which have become an under-explored source of innovation so far. Networks of individuals or knowledge-intensive enterprises are thought important not only for the creation but for the diffusion of innovation either. Thus, a persistent research question is: 'how innovation emerges, how is it shaped by policies and what we could learn and teach for them?'. The confrontation with this question requires a comprehension of the holistic evolvement of the nexus illustrated in Figure 1.

3 Contributions of the present volume

The present special issue of *International Journal of Innovation and Regional Development* consists of eight articles which correspond to aspects of Figure 1. The first four articles refer to the creation of innovation due to various 'sources' or processes. The fifth article examines policies relevant to innovation while the last three articles refer to either entrepreneurial education or learning.

Henning and Saggau (Networks, spatial diffusion of technological knowledge and regional economic growth: an agent-based modelling approach) examine the spatial diffusion of innovation due to information networks. They develop a rigorous mathematical model based on evolutionary economics, able to simulate knowledge spillover through information networks. Knowledge generation is considered either endogenous or exogenous, i.e., emanating from a source of knowledge (university, research centre, etc.). Numerical results of their agent-based model indicate that information transfer in peripheral networks is less compared to central networks and this fraction increases for scale-free networks. They also find that unlike to the classical anticipations, catching-up of technological knowledge of less advanced regions will not occur except for extreme centralised or dense networks. Since the structures of the networks are found important for the transmission of knowledge, and thus innovation potential, the results are connected with innovation policies able to support regional technological development. They are also connected with entrepreneurial organisational learning as, for instance, they show that learning is not expected to bridge large gaps in technology achievements between regions.

Kregar, DeNoble and Antončič provide an extensive analysis of an entrepreneur's personal network in their contribution (The entrepreneur's personal network structure and firm growth). They analyse a typical case of a micro-firm owner who has developed a network of 15 persons. Based on their profound methodology arising from previous work, they perform a composite qualitative/quantitative survey and reveal the structural features of the entrepreneur's principal network and sub-networks. The authors relate the quality of the network, derived from various parameters (e.g., size, interrelations, connectedness, density, efficacy, etc.), with the performance of the firm and suggest effective networking for entrepreneurs. Since modern innovation arises from networking, the contribution of Bratkovič, DeNoble and Antončič refers to a prominent source of innovation which receives special attention as it has not been worked out so far.

Ioakimidis, Casimiro, Kim and Han contribute a case study of innovation creation (Technology transfer approaches for early stage desalinisation technologies: a case study). They face the lack of fresh water problem and they develop an affordable innovation for desalinisation technologies. The case is typical for supply-driven innovations emerging from research departments, as MIT in this case. The authors see the development of their new technology as disruptive and the specific example is being taught to innovation teams of MIT as a promising disruptive innovation. It also encompasses a social value perspective. Consistent to the disruptive character of the innovation, the authors suggest a niche market for the initial implementation (prototype) as, for instance, the market of recreational boats. They also develop a competition analysis and a sensibility analysis of the costs for the early stage of the suggested innovative technology. Research centres have traditionally been a principal source of innovation and supply-driven entrepreneurship. The case study shows how modern innovating teams also exploit innovation strategies as to promote innovation in the market.

Tanimoto contributes on the origin of social innovation (The emergent process of social innovation: multi-stakeholders perspective). He articulates that social innovation is unlikely to result from an individual entrepreneur's action. Illustrative cases indicate that social innovation emerges as an open and collaborative action among several stakeholders and the community. He also notes that little research has focused on the complex process of creation of social innovation, contrary to studies of business innovation. Researching Hokkaido Green Fund (HGF), a Japanese environmental NGO, the author illustrates the creation of social innovation as a stakeholders' complex process in close collaboration with community and organisations. He refers to such a structure as the social innovation cluster (SIC) in which participate organisations, funding agencies, universities, research institutes and other stakeholders. Tanimoto's contribution opens a viewpoint on social innovation occurrence and management which complements and extends the study for sources of ordinary, business innovation. This paper, along with contributions of Bratkovič et al. and Henning and Saggau, examine the role of networking either on the creation or the regional diffusion of innovation.

Auplat, in her contribution (Radical innovation and policy-making: nanotechnology public R&D funding in the USA and the EU), deals with US and EU innovation policy within the domain of nanotechnology. The author considers nano-entrepreneurship, i.e., an exemplar of contemporary radical innovation, dependent upon public funding as most of its applications require R&D as well as strategic collaborations among institutes and companies. Despite the similarities between the two countries, US funding policies

appear more efficient as they are connected with major national departmental domains. In contrast, EU public finance comes mostly from member states as EU undergoes its integration phase. Thus, the EU policy seems less conductive to entrepreneurship compared to the US one. The contribution of Auplat provides direct evidence for the catalytic role of innovation policies towards adoption of innovation, especially for its most radical and technological form as, for instance, nanotechnology.

Regarding the impact of entrepreneurship education on entrepreneurial propensity, Fafaliou's contribution (Students' propensity to entrepreneurship: an exploratory study from Greece) surveys Greek students to reveal factors that promote or prevent an entrepreneurial career. Her sample consists of ~350 graduates of economics and business. The author assumes various socio-demographic, motivational and environmental variables, grounded in the literature of entrepreneurship, joined to the entrepreneurial propensity. Most of these variables are found to influence students' intentions either positively or negatively. Especially environmental variables constrain entrepreneurial propensity given the evolving financial crisis in Greece. However, it clearly appears that entrepreneurship education affects career planning; hence, more 'integrated' university services are suggested. As systematic provision of entrepreneurship education arises from relevant policies at EU level, cross-national longitudinal surveys on the impact of such courses are needed to address any anticipated outcomes.

The contribution of Tragazikis, Kirginas and Gouscos (Digital games for entrepreneurial learning, innovation and creativity: examples and evaluation criteria) focuses on entrepreneurial learning through digital games. They review 18 different online/offline digital games which aim to cultivate entrepreneurial skills to the players. Most of them emphasise on creativity and innovation as well as managing of small firms. These digital games are freely available or at marginal costs. Game-based learning is useful in simulating real life entrepreneurship for students who receive interdisciplinary entrepreneurial training. Business games, in general, are known as a basic tool for experiential learning in entrepreneurship. The authors further evaluate the presented examples and provide a generalised evaluative framework for the development of digital games able to cultivate entrepreneurial skills and to enhance creativity. As entrepreneurship is instructionally based on experiential learning, the newly emerging game-based learning is a noteworthy option for innovative entrepreneurship pedagogies.

Pavlov's contribution (Conceptual fundamentals of the long wave theory and the innovative potential of the Russian economy) addresses the case of Russian nanotechnology sector in connection with Kondratiev's long wave theory in economics. Based on data from the stock market combined with innovation indices, e.g., relevant patents, he examines nanotechnology under the prism of long-term periodicity of business cycles. As nanotechnology is thought a current technological breakthrough, the author concludes that the USA is in the early stage to establish a sixth long wave while Russian nanoindustry is at the stage of installation. Pavlov's contribution has a significant instructional potential relevant to the role of innovation examined by the economic theory. He also reveals the need for entrepreneurship education and policy-making which will be crucial for the shaping of the new technology breakthrough and its economic consequences. Pavlov's contribution supplements some of Auplat's arguments for the same paradigm but in a different geographical region.

References

Audretsch, D.B. and Keilbach, M. (2008) 'Resolving the knowledge paradox: knowledge-spillover entrepreneurship and economic growth', *Research Policy*, Vol. 37, No. 10, pp.1697–1705.

Chesbrough, H. (2003) *Open Innovation: The New Imperative for Creating and Profiting from Technology*, Harvard Business School Press, Boston.

Cohen, W.M. and Levinthal, D. (1990) 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, Vol. 35, No. 1, pp.128–152.

Cope, J. (2005) 'Toward a dynamic learning perspective of entrepreneurship', *Entrepreneurship Theory and Practice*, Vol. 29, No. 4, pp.373–397.

Drucker, P.F. (1985) *Innovation and Entrepreneurship*, Harper & Row Publishers Inc., New York.

Gloor, P. (2006) *Swarm Creativity. Competitive Advantage through Collaborative Innovation Networks*, Oxford University Press, Oxford.

Khurana, A. and Rosenthal, S.R. (1998) 'Towards holistic 'front ends' in new product development', *Journal of Product Innovation Management*, Vol. 15, No. 1, pp.57–74.

Koen, P., Ajamian, G., Burkart, R., Clamen, A., Davidson, J., D'Amore, R., Elkins, C., Herald, K., Incorvia, M., Johnson, A., Karol, R., Seibert, R., Slavejkov, A. and Wagner, K. (2001) 'Providing clarity and a common language to the 'fuzzy front end'', *Research Technology Management*, March–April, Vol. 44, No. 2, pp.46–55.

Minniti, M. and Bygrave, W. (2001) 'A dynamic model of entrepreneurial learning', *Entrepreneurship Theory and Practice*, Vol. 25, No. 3, pp.5–16.

OECD (2005) *Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data*, 3rd ed., OECD and Eurostat, available at http://www.uis.unesco.org/Library/Documents/OECDOsloManual05_en.pdf (accessed on 28 February 2012).

Phills, J.A., Deiglmeier, K. and Miller, D.T. (2008) 'Rediscovering social innovation', *Stanford Social Innovation Review*, Fall, Vol. 6, No. 4, pp.34–43.

Politis, D. (2005) 'The process of entrepreneurial learning: a conceptual framework', *Entrepreneurship Theory and Practice*, Vol. 29, No. 4, pp.399–424.

Romer, P. (1986) 'Increasing returns and long-run growth', *Journal of Political Economy*, Vol. 94, No. 5, pp.1002–1037.

Thurow, L.C. (2003) 'Foreword in 4th U.S.-Japan dialogue 'Entrepreneurship in Asia'', Mansfield Foundation, available at http://www.mansfieldfdn.org/backup/programs/program_pdfs/ent_thurow.pdf (accessed on 28 February 2012).

Zahra, S.A. and George, G. (2002) 'Absorptive capacity: a review, reconceptualization, and extension', *Academy of Management Review*, Vol. 27, No. 2, pp.185–203.