

**FOSTERING CREATIVITY TO RIVITALIZE THE REGIONAL ECONOMY.
AN OPEN INNOVATION APPROACH FOR ENTREPRENEURIAL EDUCATION**

*Full Paper prepared for 30th EGOS Colloquium – Rotterdam
Sub-theme 36 – Creativity in Doubtful Times*

Alfredo Biffi

Università dell’Insubria – Varese, Italy
alfredo.biffi@uninsubria.it

Rita Bissola

Università Cattolica del Sacro Cuore– Milan, Italy
rita.bissola@unicatt.it

Barbara Imperatori

Università Cattolica del Sacro Cuore– Milan, Italy
barbara.imperatori@unicatt.it

June 2014

ABSTRACT

Considering both the growing vulnerability of Italian SMEs and the worrying reluctance of the younger generation to become protagonists of new entrepreneurial ventures, this paper describes the theoretical framework and the resulting action lines to design a post-graduate entrepreneurship training program. The project innovatively develops and sustains the mindset and competencies coherent with the needs of SMEs. From the combination of an open innovation approach, research on education and on entrepreneurial training, this paper suggests some guidelines for the design of training programs to support entrepreneurship. The five training ‘ingredients’ include multidisciplinary content, open team projects, a rhizomatic training process, dedicated learning places and a fun climate. The preliminary evidence also offers stimuli on the role of academia as a vital player in the education system, to promote economic development and as an agent of change and innovation.

Keywords: Entrepreneurship Education, Open Innovation, Creativity, Rhizomatic Training, Italian SMEs.

INTRODUCTION

The entrepreneurial system has played a central role in Italy's socio-economic development up to the recent past (Amatori & Colli, 2005; Mattiacci, Simoni & Zanni, 2008). Small and medium enterprises (hereafter SMEs) are still the typical organizational form of Italian production and this entrepreneurial distinctiveness, often related to a family tradition of entrepreneurship, is recognized on an international level (Gubitta & Gianecchini, 2002; Van Stel, Carree & Thurik, 2005).

Many studies demonstrate the value and specificity of business processes in Italy (Amatori & Colli, 2005). Entrepreneurial spirit, the ability to take business risks, creativity and continuous idea-generating processes are undeniable traits of "Made in Italy" as are the flexibility of SMEs and their ability to respond and adapt to change (Alegre & Chiva, 2013). Italian districts and collaborative networks are well-known examples of successful organizational models that in the past were objects of study and attempts at replication on an international level due to their ability to combine effectiveness and efficiency (Bougrain & Haudeville, 2002).

In recent times, the distinctive and successful factors of this business model seem to be less effective. Indeed, some that in the past led to numerous advantages are proving to be hindering factors in today's global scenario, as exemplified by the data showing that SMEs in Italy are finding it difficult to play a leading role in the international scene. Some recent studies highlight the inadequacy of Italian SMEs in terms of the availability of financial resources, ownership, the lack of independence of managers with respect to owners (Scellato & Ughetto, 2010). They point to a widespread absence of managerial skills that constitutes a key factor of the structural weaknesses of SMEs in Italy, particularly in light of the increasing need for international openness (Compagno, Pittino & Visintin, 2005; Mattiacci et al., 2008). Added to the growing vulnerability of SMEs is the worrying reluctance of the younger generation to become protagonists of new entrepreneurial ventures, mainly due to perceived and mounting uncertainty (Terjesen, Vinnicombe & Freeman, 2007).

This scenario illustrates a business environment that is increasingly closed in on itself and based on small and very small dimensions, which due to a lack of managerial skills are no longer sufficient to meet the increasing complexity of the international competitive arena (Mattiacci et al., 2008).

All this confirms the need to reconsider the development of entrepreneurial and managerial competencies able to guide future entrepreneurs and the new managerial class of SMEs towards larger international dimensions and greater dynamism.

Research also shows that, given the complexity of the economic phenomena, the development of SMEs can no longer be considered a singular fact linked to enlightened individual entrepreneurs. It instead requires a managerial and collective approach involving collaborations between multiple parties and going beyond customers and suppliers to different types of competitors and partners (Schroll & Mild, 2011).

All this implies rethinking the strategic and organizational model of SMEs and establishes the importance of the design of training paths that can consistently support the development of entrepreneurial and managerial skills in a changing environment.

In recent years, a number of business training and education initiatives have been developed both nationally and internationally that seek to meet these needs, but they are still experimental pilot projects and at present lack consolidated solutions¹. This paper describes the theoretical framework and the resulting action lines used to design a post-graduate entrepreneurship training program in Italy: the ProSIT project (from the Italian *PROgramma di Sviluppo e Innovazione del Territorio*) and it offers some insights on the preliminary results evaluated by the parties involved.

The project innovatively develops and sustains the mindset and competencies coherent with the needs of SMEs and essential for entrepreneurs able to deal with the current socio-economic

¹ Among the noted examples are workshops and active training courses on an international level including, for example, *u.lab*, a laboratory for creativity and innovation dedicated to undergraduate students founded by the University of Technology, Sydney (<http://ulab.org.au>); MOSAIC, a training centre for managerial creativity founded by HEC Montreal in collaboration with universities and international companies (<http://mosaic.hec.ca/>); the master program in Leadership & Innovation in Complex Systems, a European master program jointly coordinated by the University of Aarhus and Copenhagen Business School (www.laics.net); the Innovation and Entrepreneurship (I&E) master program, dedicated to young talented engineers selected by MINES ParisTech, one of the French Grandes Ecoles (<http://www.mines-paristech.eu>).

scenario. The first edition of the training project, which won one of the major calls for private funding on a national level, is currently underway. This experience allows to offer some considerations on the training project design and to preliminarily verify the effectiveness of the theoretical framework, according with an exploratory research approach.

In particular, the post-graduate training proposal is based on recent literature on open innovation (Chesbrough 2003), consolidated research on education (Forrest & Peterson, 2006) and on entrepreneurial training (Greene & Rice, 2007) and involves collaborations between universities, enterprises, local authorities and third parties. It is targeted at new entrants to the labour market and aims to support their entrepreneurial and managerial capacities and competencies. The project is also an opportunity to stimulate some thoughts about the role of the university as a vital player in the education system, to promote economic development and to act as an agent of change and innovation.

This training project aims to help revive the business dynamism that has historically characterized the economic fabric of the Insubria region and to sustain essential international openness. It begins from innovative ideas of local businesses around which the system of people, information, content, exchange, cooperation and development opportunities is constituted, which is particularly relevant to the fulfilment of each idea. The participants of the training program are selected and assigned to one of the projects and their training takes shape around the actual innovative project that each participant is expected to contribute to. As a whole, the training project analyzed here starts from the needs of a territory, with a view to its regeneration; through the use of technology, the program enables constructing a much wider network that is potentially devoid of physical boundaries.

The paper is organized as follows. The first part presents the theoretical perspective that informed the design of the postgraduate training program or rather the open innovation framework. The central part of the contribution is devoted to the description of the ProSIT post-graduate training project for entrepreneurship. Some circumstances of the first edition currently in progress -

and presented in the boxes - provide some initial empirical evidence consistent with the assumptions suggested by the theory adopted and provide reassuring indications in terms of the project's elements of originality and effectiveness. In the last part of the paper, the first implications and challenges are identified that allow facing and exploiting the opportunities of the current socio-economic scenario.

DESIGNING A TRAINING PROGRAM TO SUPPORT ENTREPRENEURSHIP: THE THEORETICAL FRAMEWORK

The evolution in the last decade of academic and executive training in the management domain is characterized by the growing importance of relational competencies with respect to strictly technical competencies (e.g., Clarysse, Mosey & Lambrecht, 2009). These trends also characterise the SME domain, requiring training projects that are able to accompany their development and innovations through solutions where the specificities, also technical, of the context and the corporate sector are combined with a wide range of broader capacities (Gann, 2005; Helfat & Quinn, 2006).

The debate on the effective development of entrepreneurship competencies is however still open, although some experiences, often linked to innovation and entrepreneurial development, have been put forward (see, for example, Mustar, 2009; Boni, Weingart & Evenson, 2009; Schweitzer, Edwards, Nikolova & Nicolai, 2012).

Entrepreneurship has been traditionally regarded as the main topic of regional economic development. In fact, new firms bring “productive innovation” and offer new employments (Baumol, 2002; Lee, Florida, & Acs, 2004). On the other hand, Amabile (1997) defines the concept of entrepreneurial creativity and describe creativity as the main essence of successful entrepreneurial activities because it represents the origin of innovation promoted by each

entrepreneur. To succeed, entrepreneurial creativity needs to be sustained by a synergic combination of intrinsic and extrinsic motivation (Amabile, 1997).

Taking into consideration the cornerstones of entrepreneurship, we aimed at designing a training program able to revitalize the entrepreneurial and economic system of the Insubria region. We consequently decided that our training initiative would have focused on creativity and that we would have offered an adequate environment to sustain the motivation and the passion of our participants. To produce effective and stable results for the region, our belief was that the training experience should firstly engage the young participants in entrepreneurship. The condition to obtain it is that intrinsic motivation is adequately complemented with resources and environmental conditions and practices that support extrinsic motivation so that the young participants could feel safe and encouraged and the adequate motivational synergy is obtained (Amabile, 1997). Therefore, a second rationale in designing our training program was that it could provide “*any extrinsic factors that support one’s sense of competence or enable one’s deeper involvement with the task itself, without undermining one’s sense of self-determination, should positively add to intrinsic motivation and creativity*, i.e. what Amabile defines “synergistic extrinsic motivators” (p. 22, 1997).

Moreover, the challenges of the global competition together with the actual uncertain economic conditions dramatically heightened the complexity of conditions enterprises are facing. To compete in the new environment, the locus of creative problem solving and innovation necessarily shifts from individuals to the interaction of collectives (Hargadon & Bechky, 2006), thus leading companies to increasingly adopt teamwork (Gilson, Mathieu, Shalley, & Ruddy, 2005).

We consider the open innovation approach as a useful framework to design an effective training program to support entrepreneurship in such complex conditions. It makes collaboration to be open and extremely flexible so that the more relevant competencies are involved in each creative process. The production of ideas and their implementation are the focus of the entrepreneurial venture; the training program is built around the needs arising from the entrepreneurial project in a completely flexible structure.

The following part of the paragraph proposes a brief insight on the two themes that we considered at the base of designing our training program for entrepreneurship: i.e. collective creativity and open innovation.

Entrepreneurship and collective creativity

Global competition and the increasing complexity that characterizes the economic environment (due to, for example, technological innovations, socio-economic and market changes, the need for organizational renewal, dynamism, the sophistication of needs, the fluidity of preferences) require from all organizations, irrespective of type and size, the capacity to innovate, otherwise risking their ability to generate revenue and, ultimately, to survive (Corbetta, Huse & Ravasi, 2004). Essential competencies for innovation capacity include the creativity of actors at various levels who exercise their activities in the company (Amabile, 1996; George, 2007). Recent academic studies have shown that creative ideas that can become a source of sustainable competitive advantage for companies are necessarily complex in nature and require the combination of different technical and specialized skills able to converge in articulated and varied forms of collaboration (Hargadon & Bechky, 2006; Bissola & Imperatori, 2011). Organizational creativity is defined as the creation of products, services, ideas, procedures or processes by individuals working together in a complex social system (Woodman, Sawyer & Griffin, 1993). A growing body of research is focusing on the study of the collective dimension of creativity. The empirical evidence in this arena has demonstrated the benefits offered by working groups in terms of creative performance (Leenders, van Engelen & Kratzer, 2007).

The success of entrepreneurial organizations has traditionally been linked to the individual creative capacity of their founder (Lee, Florida & Acs, 2004; Ward, 2004). However, in Italy, rarely are entrepreneurs able to accomplish the type of collaboration around creativity that today is indispensable to translate their insights into corporate actions that can generate positive economic results (Greve & Salaff, 2003)

Entrepreneurship and open innovation

Behavioural innovation and the ways of managing relations following the recent spread of Web 2.0 technologies and social media in particular, have given SMEs the opportunity to broaden the context of collaborations for innovation beyond the boundaries of the company. This leads to involving third parties that were traditionally considered as external (such as potential customers, other businesses, institutions and professionals), thereby encountering the competencies from different fields that are necessary today for the development of creative outputs. This context is called open innovation (Chesbrough, 2003, 2006).

The concept of open innovation is becoming increasingly popular in organizations that are looking for new ways to create innovation (Huizingh, 2011; Schroll & Mild, 2011). Chesbrough (2003) states that the concept of openness ‘... *refers to the ways of sharing with others and encourage their participation*’ (p. 88). Consequently, open innovation is not just a business model, but it is also a way of organizing the creation of collective knowledge.

Access to an open innovation context requires companies to change their internal practices and involves establishing partnerships with entities outside of the organization. In the medium to long term, it is important for entrepreneurs to be able to rely on a broad and diverse partner-base, since very durable and stable collaborations may restrict the capacity for divergent thinking and reduce any advantages of innovation potential for partners (Chesbrough, 2006).

From a procedural perspective of open innovation, the concept of openness should be considered as a continuum between the “closed” and “open” extremes. In this regard, organizations need to consider the costs of “openness”, which include the costs of coordination and competition between the actors involved (Dahlander & Gann, 2010). Another important element is the development of an organizational culture focused specifically on collaborations in open innovation conditions (Herzog, 2008; Herzog & Leker, 2010).

From an organization and management perspective, some of the potentially problematic aspects of collaborations in an open innovation context are the expectations of different partners to

take over the leadership of the collaboration, the organization of the interface mode between the actors involved, the collaborative process and the challenges in relation to the definition and management of the context (Lazzarotti & Manzini, 2009; Ollila & Elmquist, 2011).

The organizational challenges that accompany open innovation include the need to organize to achieve the “open” dimension, which essentially means: defining new practices and integrated organizational structures; sharing the meaning attributed to the value of co-produced innovation (the parties often need to redefine the value aspect of the output obtained and how this value can be communicated); identifying the essential elements of leadership oriented to the enhancement of diversity typical of open innovation and managing the intellectual property of innovation processes (Giannopoulou, Ystroem & Ollila, 2011; Teal, 2010).

Others important aspects of entrepreneurial attitudes include the features that characterize young entrepreneurs who are part of Generation Y. According to Generational Theory (Strauss & Howe, 1991), YGen is a term that designates a cohort of people born between 1982 and 2003 (Strauss, Howe & Markiewicz, 2006). They are described as the Virtual Generation, familiar with virtual technologies and therefore characterized by cognitive, learning and communication styles, requiring aligned teaching and pedagogical means of interaction: non-linear, autonomous, networked and conceiving learning as fun (Proserpio & Gioia, 2003; Terjesen et al., 2007).

All these considerations offer opportunities and implications for the design of entrepreneurship training programs, particularly with reference to the collective dimension that is essential today (Perkmann & Walsh, 2007). In considering the open innovation approach, the collective creativity perspective and the typical traits of Italian SMEs, several issues of entrepreneurship requirements emerge, suggesting new directions as well as new training needs.

INGREDIENTS FOR ENTREPRENEURSHIP TRAINING IN THE OPEN INNOVATION CONTEXT

Starting from the relevance of collective creativity for entrepreneurship and moving from the perspective of the open innovation, we identify some issues discussed in the literature of these domains that are relevant as “ingredients” for designing a training initiative to develop an entrepreneurial mind-set and the related competencies. The ingredients we identified are: *multidisciplinarity*, that can help in finding innovative solutions to face complexity, *team openness*, (that gives flexibility to the project and allows to involve the more aligned competences in each situation, *rhizomatic process*, that allows the training program to be dynamic and obtain the most creative results, *dedicated place*, so that “more democratic” and open conditions are maintained and the creative process does not undergo constraints and pressures from none of the parties involved, and *fun and challenging climate*, that contributes to the motivation synergy useful to promote creativity and innovation..

Content: Multidisciplinary

Creativity benefits from the interaction of different 'points of view' and technical competencies (Mumford, Scott, Gaddis & Strange, 2002). Multidisciplinarity and variety, also in approaches, is all the more important in a business setting where the problems are increasingly uncertain and complex and demand by their very nature the combination of methodologies, guidelines and technical specializations (Hargadon & Bechky, 2006).

This emphasizes the importance of the development processes of different technical competencies, but also enforces designing solutions capable of supporting confrontation and practising exchange and cooperation skills (Gulli, Devine & Whitney, 1995).

This is amplified in an open innovation context, where multidisciplinarity and the consideration of different points of view are constituent factors in activating creative occasions.

However, cognitive diversity can also entail interpersonal conflicts and communication difficulties, especially in an 'open' context, which is not stable over time but ever-changing and usually involves long periods of preparation and mutual understanding.

Model: 'Open' Team Project

Literature on creativity demonstrates that in the presence of complex problems a team can be an effective coordination mechanism able to integrate competencies and perspectives and enhance the logic of divergent thinking (Bharadwaj & Menon, 2000). The recurrent pathologies linked to this form of organization, such as, for example, pressure to conform, also vary - flattening variety of thought, opportunistic behaviours - and trigger phenomena of self-exclusion and related behaviours. Team work therefore requires advanced competencies and dedicated ways of interacting that must be supported and designed (Gulli et al., 1995).

An open innovation context is constituted by teams in which multiple actors with different competencies and from different, and at times competing, backgrounds (e.g., research institutes, academia, businesses, local authorities) are required to interact (Boni et al., 2006). This underlines the centrality of the team for creativity, but also enshrines the need for interaction and relational dialogue skills and social structures (Strange, 2002). Therefore, structuring work in open teams where actors from different backgrounds can spontaneously confront each other at different levels is crucial, as is the role of the facilitators of this process.

Process: Rhizomatic

Part of the literature on organizational creativity supports the effectiveness of the design logic (design thinking) in increasing the creative content of collective action (Martin, 2009). This is also reflected in the traits that distinguish the approaches to training for creativity in firms, amongst which many initiatives can be identified that are based on such premises (Dunne & Martin, 2006). The design logic based on divergent thinking, de-contextualization, chaos, the game but also

reflection and openness to other perspectives, is traditionally opposed to analytical logic and the linear process (Schweitzer et al., 2012).

In the case of open innovation, collaboration between partners cannot rely on the structure and management systems that define each organization; on the contrary, the system of rules that underpins the actions of each organization must be able to interact, enabling the necessary dynamism of mutual contamination that leads to shared creative knowledge.

For these reasons, the rhizomatic approach in the Deleuze tradition seems more consistent, which aims to overcome the dualism between a-logical and logical to consider instead a process that involves a network of actors among which hierarchical relationships cannot be identified (Deleuze & Guattari, 1987). The rhizomatic process combines the production of collective knowledge through a non-linear, complex, emergent, even 'intricate' path that is consistent with the design logic, with its own rational and logical analytical thinking procedures and recognizing the equal dignity of both approaches (Teal, 2010).

The rhizomatic process produces an action consistent with its potential to the extent that it simultaneously admits the approaches to deductive, inductive and abductive² thinking and allows these to combine and interact with each other in a non-linear iterative process, while the reasoning techniques underlying each approach are structured and designed.

The rhizomatic process appears to be particularly appropriate in the case of open innovation because it enables maximizing interaction agility between partners, enhancing the benefits of diversity in a logic of emerging creativity. The system of rules and procedures, more consistent with rational logic, instead guarantees each partner the constant recognition of their own identity and allows maintaining the focus on strategic goals and the development direction. All this bestows the rhizomatic process the capacity to produce functionally creative and cost-effective results for partner organizations.

² The abductive approach is based on the synthesis between inductive and deductive reasoning that allows obtaining new knowledge that would not have been attained by the inductive and/or deductive approach considered individually (Dubois & Gadde, 2002; Ungaretti, Chomowicz, Canniffe, Johnson, Weiss, Dunn & Cropper, 2009).

Place: 'Outside' of the Company and Open to Contamination

The results of recent research demonstrate the importance of the design of the 'space' to support creativity in the workplace and for the learning processes (Magadley & Birdi, 2009; *metti citazione su learning*). Creative thinking is supported by work spaces 'outside' of the usual working environment, spaces that can encourage lateral thinking, de-contextualization, interaction and help people depart from routine. This underscores the importance of the layout, but also the centrality of identifying a place, even symbolic, that is separate from that of customary work.

These considerations are certainly amplified by the open innovation framework, which also suggests the importance of designing inclusive (vs. exclusive) spaces to encourage participation, or rather, penetrable 'from' and 'towards' the outside.

Climate: Fun and Challenge

The link between creativity, fun and challenge is also widely supported in managerial literature, which shows the positive relationship between the work climate and enjoyable, playful yet challenging learning, i.e., not obvious and trivial (Hunter, Bedell & Mumford, 2007), an environment able to activate and release energy towards new ideas and then channel these towards the functionality of the objective.

The pleasantness dimension in an open innovation context can act as an integrator and catalyst while quickly and smoothly facilitating not only divergent thinking, but also relations and interactions. On the other hand, there is also evidence of the organizational costs of pleasantness, including time and resources used to activate and maintain the organizational climate, distractions, leisure time and low focus on objectives. However, the ability to compete in a challenging and complex open innovation context seems to outweigh these risks and emphasizes the functional aspect of creative occasions.

TRAINING FOR ENTREPRENEURSHIP IN AN OPEN INNOVATION CONTEXT: THE PROSIT CASE

The project, called ProSIT (from the Italian PROgramma di Sviluppo e Innovazione del Territorio, which stands for Program for Territorial Development and Innovation), is currently in progress in its first edition. This program, established in January 2011, originated from the ideas of some organization and accounting researchers of the Faculty of Economics, University of Insubria, Italy. The project was then elaborated with the input of some colleagues from the Catholic University of Milan on the subject of creativity and became a project of the University of Insubria (Italy, Varese) involving different departments (i.e. Economics, Science of Material, Chemistry, Law, Physics, Biology, Environmental Science, Informatics).

The project was made possible thanks to funding from the Cariplo Foundation, the IntesaSanPaolo Banking Group, following an annual call for applications dedicated to the promotion and development of human capital of excellence³. The project was amongst the winners for originality and expected goals at the end of 2011.

The ProSIT Educational Objectives, Structure and Actors

ProSIT is designed as a training proposal for entrepreneurship and involves the geographic areas that make up the Insubria region (particularly the areas of Varese, Como and Ticino in neighbouring Switzerland). Specifically, it aims to meet two basic and integrated needs: to develop innovation in an area that is gradually losing its identity and its ability to be competitive - in part because of the economic crisis and in part due to historical reasons - and to create new local entrepreneurial levers capable of designing and implementing innovations.

³ The Cariplo Foundation is a philanthropic entity that provides grants to third sector organizations for the realization of socially useful projects. "In light of the problems identified, the Cariplo Foundation has set itself the aim of supporting and promoting the development of human capital, focusing on a limited number of projects to initiate activities aimed at the pursuit of excellence in undergraduate and post-graduate studies....." (Cariplo Human Capital call for applications 2011).

The identifiable evidence in the territory and the premises on which the project is built are as follows.

First, many entrepreneurs in the region have creative ideas (new products/services, new markets, new production processes, see Table 1) that they have not yet been able to realize (e.g., lack of time due to the excessive work commitments of the main business; lack of the "right person" to take charge of the idea and develop it, or having only partial technical or management knowledge with respect to that required for its realization; conceptual difficulties in moving from the vision to the logical and physical transformation of the idea).

Insert Table 1 about here

Second, universities are generally endowed with significant know-how potential and, often, the propensity for entrepreneurship especially in students who demonstrate a clear determination to be leaders during their student careers and in professors with a strong propensity to apply their research.

Third, knowledge is generated and disseminated more and more from universities and research centres, and from those who daily seek and find workable solutions in the field; the interaction between these two worlds can have a positive impact on the further development of knowledge if original forms of creating an effective relational, fiduciary and operative context can be established.

In addition to the participants of the training program and the university, those actively involved in the project include companies proposing innovative projects (Table 1); the Science and Technology Park⁴, which supports the identification of innovation projects, assisting and tutoring on

⁴ The ComoNExT Science and Technology Park has recently been established with the objective of promoting the economic development of the Insubria region and cities through:

- the creation of new firms and increasing the value of mature companies, bringing them closer to a systematic use of new technologies
- the promotion of new entrepreneurs and consortia of SMEs for the development of new ideas and the implementation of technology transfer

specific content; the funding institution and its local territorial units (specifically the Provincial Foundation of the Como Community); the territory with its entrepreneurial associations, which see in the project a different and innovative experiment for local economic development; researchers of other universities who specialize in specific content. The University of Insubria also plays a role as facilitator and coordinates the various actors. Figure 1 shows the network of ProSIT actors, indicating the strong relations amongst them and the mediation roles managed by the main connecting node, namely, the ProSIT management team, which directly manages the overall program and is the point of reference for actors working permanently in the program projects (core project team).

Insert Figure 1 about here

The Distinctive Features of ProSIT

Given these premises, the originality and uniqueness of the ProSIT project are not so much in the purposes and content, but in the design of the process that is guided by the open innovation theoretical framework. The design of the program was in fact an opportunity to test the activation and combination of the five ingredients identified in the previous section.

The content

ProSIT calls for the development of multi-disciplinary skills and opportunities for continuous debate and exchanges. The portfolio of training courses and occasions for discussions are highly interdisciplinary and in part common to all participants (topics on innovation management, basic elements of economics-management/key scientific subjects, project organization and management, business planning, team working, the generation and use of creativity) and partly

-
- incubation of innovative companies
 - the generation of new jobs based on knowledge
 - stimulation of synergies between institutions performing scientific research (universities, polytechnics, research centres) and companies
 - the attraction of research and development departments of medium-sized companies (www.comonetxt.it)

specific to each individual project, designed according to those topics that are of interest to the individual project teams (Exhibits 1 & 2).

EXHIBIT 1

The ProSIT Courses and Learning Activities

The courses that all program participants must attend cover the following disciplines:

- Business management elements (governance, strategy, market, organization, accounting, operations)
- Elements of science for firms (basics in chemistry, materials, physics, computer science, biology)
- Intercultural (an international view of business)
- Soft skills: individual and group behaviours; leadership
- Developing and sharing creativity
- The business plan
- Innovation management
- Project management

For each specific project, each participant is offered learning occasions that are strictly functional to the implementation of the specific project and consist in:

- Courses at other institutions
- Participation in conferences
- Interviews and meetings with experts and leaders
- Flanking tutors and experts
- Coaching on specific content

EXHIBIT 2

Examples of Multidisciplinary and Co-design in the ProSIT Programme

Project A: A company in the textile industry seeks an efficient and effective solution for the electronic management of its drawings, sketches and samples created over time. The issue is technically complex due to the nature of the objects to be managed. However, by analyzing other sectors (e.g., the management of documents and objects of art, the fashion industry in the strict sense, sub-components of different sectors etc.) and by relating with the respective actors, solutions could be identified, individually and partially with respect to the different problems to be addressed, but which together lead to identifying and implementing the final solution.

Project B: The project consists of a technical and commercial study of industrial forms for the production of wire for industrial use. The technical team is made up of people from the company, a graduate participating in ProSIT and researchers from a university in north central Italy who in part interact in face-to-face meetings and in part with the specific design technologies. This is one of the areas that best highlight the need to co-design and that lend themselves to using the operating logic of the design approach.

The project team

ProSIT proposes an 'open' project team where several actors with different competencies and from different, and at times competing, backgrounds (e.g., research institutes, academia, businesses, local authorities) are required to interact to produce innovation aimed at developing specific projects. The training project is funded in small part internally (university and companies) and, above all, with the contribution of the Cariplo Foundation, in partnership with ComoNext (Science and Technology Park) and the Como Community Provincial Foundation, with the aim of bringing together various business stakeholders.

The participants are graduates with different degrees (bachelor, master, doctoral, in a rhizomatic logic) and have a propensity towards developing further knowledge in a business context and towards experiential learning. Their backgrounds are diverse and their degrees vary greatly, ranging from techno-scientific to economic management, social and human sciences in the broad sense.

The faculty is composed of Italian and international academics, professionals and business persons, with expertise in different areas able to cover the various techno-managerial contexts of projects activated through their previously unrealized dreams and to contribute specific knowledge on innovation (in an open innovation context in particular) and creativity.

The learning process

ProSIT supports the activation of a rhizomatic process, based on divergent thinking, de-contextualization, but also reflection and openness towards other perspectives, opposing analytical logic and the linear process. Each team revolves around a project, which in turn is assigned to a chosen participant based on the project characteristics. The projects are proposed by companies and selected on the basis of their originality, practicality and ability to contribute to the development of the territory. The innovation projects (Table 1) must produce a concrete result within a maximum of

18 months through the joint work of the company, participant and tutor ⁵. This result is expressed either in a prototype product (e.g., development of a plasma process), an operational service (e.g., anti-usury assistance and support), a technical and commercial feasibility study (e.g., products based on medicinal herbs), an engineered business process (e.g., technical drawings management).

The process is emergent and non-sequential. It is driven by the innovation projects and by their requirements. The alternation between ‘work’ and ‘study’ is not pre-established and follows the needs that arise in practice. Roles can also be interchangeable depending on the issues emerging from the projects; teachers, tutors, business professionals and also students can lead the learning process, if they master the crucial competence needed to face the situation. This means exploiting competencies overpassing the boundaries of each project.

The project finally has some distinctive elements (Exhibit 3): it is managed in an academic context and in relations with highly innovative companies, there are no preconceived schemes for resolving various problems (for example, the selection of graduates, the disbursement method of their loans, contracts with companies and partners, and so forth), but individual solutions that must be constructed from time to time depending on the needs of the project and in accordance with the legal dictates that public universities are subject to.

The learning place

The project proposes the development of an inclusive (vs. exclusive) space designed to encourage participation and penetrable 'from' and 'towards' the outside.

The ProSIT project is developed in an ‘open environment’ of sharing and collaboration in which the different stakeholders meet and work/create, each according to the logic of maximization of own interest, but also resulting in the development of a joint project (Figure 1).

⁵ The tutor, who can be a business person, a specifically identified external expert or university professor depending on the project content, has the role of guiding the participant and the company in the development of the project in terms of required content and the project management process.

EXHIBIT 3

Project Value

- . The ProSIT project, compared to similar programs (characterized by collaboration between universities and companies to develop new businesses) stands out for the following reasons:
- Arts and crafts are resumed as the heart of entrepreneurial activity and are developed with graduates in a continuous search for new content and applicative solutions.
 - The network of actors supporting the work leads in turn to unexpected protagonists in the construction of the business plan (see Exhibit 4), namely, persons suddenly emerge with their hidden abilities with respect to the skills initially valued.
 - The university's capacity as a tangible mediator emerges, and not only as experts of content, coordinating actors in the network of entrepreneurial projects.
 - Creativity is the core of the program in the constant search for truly unique and original solutions to problems that arise in the ProSIT process.

The learning climate

ProSIT maintains an atmosphere of fun and challenge that activates and releases energy towards new ideas and then channels these towards the functionality of the goal.

In particular, in the training process the various project participants come together in a multidisciplinary context of sharing the content of their projects and complementary material.

Teambuilding skills are developed in ProSIT through informal and original occasions and events that stimulate the production of ideas as well as debates and entertainment, including, for example, the organization of an exhibition open to the public to creatively present ideas and projects, tournaments and challenges between participants, but also incentives to proactively take action in relation to parallel and lateral activities (fun, but also useful for continuous improvement).

RESEARCH DESIGN

In keeping with the aim of exploring the effectiveness of the proposed and adopted open-innovation approach for entrepreneurial training, a preliminary data collection was conducted through both participant observation and semi-structured interviews (DeWalt & DeWalt, 2002).

From one side, *participant observation* was performed by the three authors, that are directly involved in the training project as designers, coordinators and trainers. Participant observation has been conducted since the origin of ProSIT and it has been elapsed for 13 mounts (till now). The authors have participated in the life of the training project, they conducted informal interviews, direct observation, collective discussions, analyses of documents, self-analysis, and life-histories.

From the other side, *semi-structured interviews* were conducted with 24 stakeholders representing different interests and perspectives (i.e. 9 project participants; 7 entrepreneurs; 5 scientific actors; 3 local institutions). All the interviews adopted a common structure, consisting of an open-ended format that enabled us to collect both factual data and personal impressions. We first asked our respondents to reconstruct their personal experience to distinguish facts from individual observations. We taped and transcribed all the interviews. Some information we collected required further probing or clarification of minor discrepancies at a later stage; this meant that we interviewed some respondents more than once. Multiple interviews helped us to reconstruct a “story” for each process. Although, our reconstruction was based on our respondents’ recall, by combining multiple perspectives we were able to move beyond individual perceptual biases and alleviate potential recall problems.

The multiple data sources enabled us to compare the perceived, declared, and subjective viewpoints of the actors involved, which were actually implemented along with users’ behaviours and experiences. We used an iterative process of cycling between data, emerging theory, and relevant literature. We developed initial categories related to online and face-to-face experiences based on all the interview transcripts. Then we related these categories to literature and to other data gathered, controlling for internal consistency. When consistency was confirmed, we retained the topic; otherwise, when evidence contradicted an emerging theme, we abandoned it, returning to the theory to investigate and refine the framework (Hargadon & Bechky, 2006).

PRELIMINARY RESULTS

The value of ProSIT: The On-going Results for the Parties Involved

The ProSIT project aims to bring together various actors, strengthening their knowledge and competencies. This collaboration is one of the project's results and is due to the manifold effects (non-random) also with respect to all the actors involved who make the project not only possible but also interesting for the various stakeholder categories concerned.

Through the project, *participants* develop their knowledge and competences (technical and/or managerial), their creative competencies through cultural contamination in an interdisciplinary team, their propensity to activate and start new businesses, through direct activities with entrepreneurs and within real business projects, their motivation and engagement toward both the concrete business projects in which are involved and the learning process.

“I’m very satisfied of my project, because I’m involved in each project phases, since from the beginning and I helped my boss to develop the original idea.” [ProSIT student # 3].

“I was surprised to have the opportunity to collaborate with so many professionals and teachers, to solve real problems! I have never experience nothing like this, in my student’s career and I think I am learning a lot. I also hope to be helpful and constructive for the other participants’ projects.” [ProSIT student # 8]

“I needed to develop my knowledge about how to design database for our new services in fire management. I asked to another ProSIT student that is an expert in designing data set for researching purpose and I found my specific solution also learning interesting new techniques.” [ProSIT student # 9]

The involved *entrepreneurs* develop their capacity to implement new ideas through a factual collaboration with the university as well as their propensity to openness, while safeguarding the

legitimate need for confidentiality, in an environment with a high possibility of generating innovation to identify new solutions to their technical and/or management needs.

“I’m fully satisfied about this partnership with the university and I’m also surprised to have the opportunity to collaborate in a so concrete way. The ProSIT student is a real ‘contact point’ that enable me to interact with various parties and to implement new ideas solutions useful for my business ” [ProSIT entrepreneur #1]

“The kick off educational open meeting was an interesting and useful opportunity to exchange ideas and proposals. I’m pleased to know that will be possible to organize systematically similar events - such as a periodical State of Working Meeting- inviting companies, students, and all the people who are interested in ProSIT!” [ProSIT entrepreneur # 3]

“I realised that joining the ProSIT project is an opportunity to reinforce my creativity in a functional way. I had the possibility to implement and finalize an idea that I would have never been able to pursue by myself.” [ProSIT entrepreneur # 6]

Universities find in ProSIT the stimulus and opportunity to enhance their ability to collaborate with companies on specific problems and extend this to those areas (usually less technical) that are often more remote. They can also put into practice a multidisciplinary projects through the exchange of knowledge between participants in classroom activities and among colleagues.

“Not only companies look for brilliant students and graduates. Thanks to ProSIT I found the right person for my department: a brilliant graduate in economic for a new project that aims to develop the business of trout’s breeding. I hope it will be possible to exploit similar possibilities within the university, exchanging experiences, information and knowledge!”
[a Professor of Biology Dept. involved in ProSIT Coordination team]

“ProSIT gave me the opportunity to face real problem implementing and exchanging knowledge both with entrepreneurs, participants and other colleagues. I now realize that this could be relevant and significant for my research purposes and projects” [a Professor of Organizational Behaviour, involved in the ProSIT Faculty]

Lastly, the *territory* obtains multiple results. ProSIT supports the development of competencies that are functional to the area and provides particularly interesting and valuable employment opportunities in this time of crisis and uncertainty. The project also activates concrete occasions and opportunities for collaborations between local actors and supports the creation and development of new companies.

ProSIT forms potential new entrepreneurs with high level competence profiles aligned with the global context, and can in turn become enablers of innovation (Figure 2). New knowledge, new businesses, new entrepreneurs and, in particular, a new way of thinking about the relationship among actors with complementary interests and utilities, thus representing the result of the overall value expected from ProSIT.

“The ProSIT program is embedded into the local territory and this is of great value. The idea to use different local and public sites) to perform the various ProSIT activities gave it a great visibility (e.g. a room next to the open space where services offered to the entrepreneur in the institution for enterprise development; open room in the Scientific Park; periodical exhibitions and laboratories in symbolic public locations).” [Director of Como Chamber of Commerce, local partner of the ProSIT program].

“The main values of the ProSIT program is its ‘changing power toward innovation’ for the local enterprises. Thanks to the ProSIT project, we observed new concrete business ideas and new possibilities for future development of the local business community. The project has also activated concrete circumstances and chances for collaborations among local enterprises which is a completely new way of acting for the local SMEs” [Director of ComoNext, local partner of ProSIT program].

Insert Figure 2 about here

The Challenges of Training for Entrepreneurship in the Open Innovation Context

The ProSIT experience, especially with reference to its now complete design phase and as for the ongoing activities (project is currently halfway), suggests some critical aspects to consider when planning and implementing training projects in an 'open' logic focused on developing a capacity for entrepreneurial innovation. Some of these refer to the institutional and cultural context; others are attributable to the more general theme of project competencies.

The participant observation to the ProSIT program allows to identify some attitudes and competences that play a crucial role for designing and implementing a training program based on the open innovation approach.

The Cultural Mindset

A crucial aspect for the development of a training course according to an open innovation logic concerns the need and the capacity to activate relations with different institutional subjects. These relations are configured in different ways consistent with the characteristics and needs of each project. They can involve individuals who are able to contribute skills and ideas (as in the case of university departments and the Science and Technology Park. The latter in particular is able to assess the opportunity to create a new business starting from the initial idea of each project) or pivotal institutions to access physical resources and functional logistics in the realization of each project. The local Foundation is the cornerstone of ProSIT in accessing relations with other local institutions that have enabled obtaining locations that are appropriate and functional to the realization of the projects (e.g., spaces in the Como Next Technology Park headquarters, outside of the universities, but also company premises, accommodation offered free of charge to external participants).

The rhizomatic process, through which the ProSIT training project is realized, defines a configuration of specific relations for each business idea to be actualized. In order for the configuration to be effective, a *modus vivendi* and *operandi* needs to be found that will enable organizational cultures that come together to not only co-exist, but hopefully enter into a reciprocal exchange that feeds diversity and enhances the creative component of the process.

From a practical point of view, some possible expedients for this purpose are the practice of analyzing problems according to a modelling and conceptual logic; the practice of always keeping in mind the implications of what is decided and achieved for the business; timely compliance with all aspects agreed in accordance with the institutional framework that governs the relationships between the subjects. For each network of relationships to be able to act and decide effectively requires training the players in terms of the value of diversity and opportunities for change from the perspective of organizational creativity and innovation capacity.

Key Competencies

As with all training projects, in the open innovation logic a further and essential aspect concerns the competencies that are proving crucial for the implementation of the training project. In the ProSIT experience, the following have an important role:

First, the ability to create a shared vision of the project and to communicate this to all the actors involved in each case. This collective process is started by those who share the idea and gradually refine it until it becomes a project. Thereafter, the embryonic vision continues to evolve and is modelled in formal and informal occasions (Exhibit 4) and through the involvement of other actors who significantly contribute to its implementation.

EXHIBIT 4: Unsuspected Capacity
The choice of candidate to be assigned to each entrepreneurship project is based on traditional selection tools such as the evaluation of curricula, multiple interviews, verifying the alignment between expectations and motivations on the one hand and the opportunities offered by the

training process on the other. The goal is to identify a technically competent candidate, motivated to learn the techniques and strategies for cooperation in order to work immediately in an actual, innovative project. The difference in age and experience between the candidate and the employer usually leads the latter to draw the former. At times, however, the roles are reversed! Start-up entrepreneurs are often good technicians focused on the success of the product/service and little on the managerial aspects of structuring the enterprise. They therefore find it difficult to understand the importance of certain relationships and key collaboration mechanisms and administrative processes. In turn, technical graduates may have similar characteristics or are eager to immediately discover what is actually involved in applying what they have learnt in their studies. This is what occurred in the initial phase of one of the project of the first edition of ProSIT concerning the design and implementation of innovative heating elements for business and family environments: an electrical engineer was called to assist the entrepreneur in technical activities. Initially, some misunderstanding arose among the various actors in the network (graduate, entrepreneur, universities, scientific partner) caused by the project team's high concentration on the technical content of the product and a superficial approach to the management components of the project. Thanks to some meetings managed by the university coordinator, the graduate understood the problem, drew the entrepreneur towards the less technical aspects and went ... beyond. The initial difficulty allowed the participant to experience firsthand and learn the importance of the relational aspects in terms of the project's progress and thus spontaneously and automatically becoming spokesperson for other graduate colleagues interested in the ProSIT program on the need for an all-round approach and the substantial importance of a management perspective. The strength of meeting in an open innovation environment and in relation to a real project changes the mindset of participants and benefits the results.

Second, the ability to find a synthetic form of the body of technical, and even complex, knowledge that is essential to putting the project idea into practice and the ability to find the most effective way to convey this body of knowledge to people with different academic backgrounds.

Third, the ability to manage relationships in varying interdisciplinary and interorganizational teams.

Fourth, flexibility and openness towards diversity that allows the team members to take full advantage of the rhizomatic and collective learning process that is activated for the project's implementation and allows optimizing the innovative content of the results. The development of these competencies can be particularly challenging in the case of actors from organizations with

formal and bureaucratic cultures where pro-activity, creativity, problem-solving skills and the capacity to take initiative are either not required or very popular.

Five, the ability to engagingly communicate the project specificities in order to stimulate numerous applications in coherence with the distinctive features of the ProSIT project. With regard to potential participants, the emphasis on centrality and direct involvement in specific projects from the start of the program should be an exciting aspect for young graduates eager to emerge themselves fully and to confront the business challenges. A further message to emphasize concerns the development of the learning process in a rhizomatic logic, which brings the ProSIT experience closer to everyday professional life and which increasingly takes place in collective settings (Exhibit 5).

EXHIBIT 5

People Learn to Collaborate (The Hidden Side of Open Innovation)

Some corporate environments - despite years of reengineering, team building, work objectives that may include group activities - sustain activities and relationships in self-referring and uncoordinated organizational units using a silo or vertical approach. A similar phenomenon also exists in the Italian academic context, where research experiences and truly interdisciplinary education in integrated faculties and perspectives are still limited. The ProSIT program is highly interdisciplinary in content as well as in the approach and the nature of activities carried out in the academic sphere (project work, research, training and teaching, administrative management of internal funds and those provided by companies), thus imposing horizontally integrated and highly coordinated organizational solutions. For some of the actors still working in a logic of independence, the project is configured as a very useful learning and training ground: the different actors within the university, driven by the need to solve operational problems, find new solutions to previously unaddressed problems, develop alternative solutions to old problems, interact with each other personally and thus increase the level of mutual cooperation. In particular, in work domains guided by procedural logic, people discover the pleasure of proposing a 'non-procedure' provided that the objectives are reached and thereby activating potentially new procedures. They learn to work together and creatively address the various situations while respecting the rules. That which cannot be observed on formal occasions (the training activities, the promotional event, the progress meeting, etc.) is that which creates greater value in the open context activated.

This requires workers to grow according to a continuous training approach, reconciling different learning methodologies and tools, and open to the use of technologies that are increasingly Web 2.0. based. To be effective in this reality requires the ability to seize even unexpected opportunities, integrating them into the system and exploiting them accordingly (Exhibit 6).

EXHIBIT 6

Open Innovation as an Additional Factor of Learning (Pre Prosit)

When a project is born, the components of the specific results expected are usually defined in the work plan. During the implementation phase, new opportunities may present themselves in the context of the project, but the team may not always perceive these, especially if focused on implementation issues. An open innovation context that amplifies the relational network instead enables not only the creation of many opportunities, but also their recognition and the ability to immediately use the opportunity as an additional element of the project and/or as an additional activity, thanks to the multiplicity of actors and to continuous listening.

ProSIT validates this potential. For example, during its implementation, another project with a local university was created to develop some joint seminars in which students in the last two years of university, final-year students of a technical institution and ProSIT participants jointly participated and interacted. This occasion was interesting because it was activated as a side project to enhance a range of competencies acquired through ProSIT. A process of interdisciplinary contamination began between students differing by age, knowledge and learning objectives, which proved particularly effective for the development of the seminars and created recruitment and first selection opportunities for some students. The exchange of ideas, experiences and solutions between the two universities has created the opportunity to design a pre-ProSIT phase that clarifies the concept and the reality of what could be done jointly with companies in the future.

The ProSIT team was able to capture the emerging opportunity and prepare some transfer of learning activities for students as well as promotional activities: during the courses of their curricula, those who participated in joint workshops (extra curricular) communicated to their companions what had occurred, what they had learnt, the wealth of content and relations that led to the final result. A driving force for communication and learning was created for a greater number of students than those who had direct experience and the foundations were laid for the promotion of ProSIT with a view to its future editions.

FROM THE PROJECT TO EDUCATION: THE TRAINING APPROACH

Combining the open innovation approach with literature on training and learning management, the analysis and the evidence thus far available on the ProSIT case, enabled identifying a series of recommendations and suggestions for the design of managerial development courses to support creativity, with particular reference to the approach and methodologies.

This combination confirms the importance attached to a mix of mostly interactive methods where the concrete experience of the learner increasingly plays a decisive role and where the team becomes the development context (Clarysse et al., 2009). Specifically, however, what again suggests the aforementioned is the value of exchanging roles between 'reality' and 'theory': the former should be placed at the centre of the entire process while the content and the different learning opportunities must be activated around its flow.

In this regard, the open innovation perspective provides the bases, also conceptual, to subvert the traditional relationship that underlines the design of many, even innovative, training processes according to which 'training' is an opportunity in support of 'creativity and innovation' (Woodman et al., 1993).

Placing reality at the centre means that the occasions, content and the techniques that will *a posteriori* form the training process will be identified by the needs, problems, doubts, the stimuli, the desire for confrontation that the students and teams responsible for the implementation of real creative project experience and identify also thanks to other actors in the educational process. Specifically, the training plan emerges from the needs that arise from time to time and is not constructed *a priori*, but develops with the evolution of the project. The effectiveness of the emerging training process will be greater the more participants are open to a rhizomatic logic of collective knowledge formation through the contemporary actions of deductive, inductive and abductive thinking approaches.

Indeed, the use of combined abductive, deductive and inductive thought perspectives offers a valuable opportunity for the contamination of different approaches and knowledge, thus opening the way to generating functional creativity and continuous innovation in firms.

Overcoming the traditional contrast between design thinking, analytical-rational thinking and the synthesis of abductive, deductive and inductive approaches and multiple perspectives also enables developing the project with an incomparable level of detail and allows considering the more minute aspects and the indirect implications of different alternatives (Dunne & Martin, 2006; Teal, 2010).

The implementation of a training program consistent with the characteristics described requires the 'open' participation of different actors including businesses, professionals, local organizations, institutions and universities where participants learn in the field through their immediate involvement in real projects. The emerging nature of the learning process allows all players who participate to develop the mindset and competencies for creativity to the benefit of not only learners, but also all those who, for various reasons, actively participate in the process and thus have the opportunity to become agents of change.

In summary, the choice of methodologies to support learning for creativity translates into a change of paradigm where learning occurs through: concrete open innovation projects implemented in collaboration with companies, institutions, sponsors, the territory and universities; an emerging educational process in function of the specific needs of the projects and teams (from the innovation project to the training process); a consultative training style with the increasingly important role of coaching and mentoring activities (alongside more traditional methods); the definition of a 'place' for open innovation, outside of company spaces, other than university institutional headquarters, comfortable, functional for collaboration, reconfigurable, recognizable and open also to the territory. Moreover, the conceptual framework adopted requires to activate channels and occasions of openness and communication towards the outside that enable continuous exchanges not only with the surrounding physical environment (exchanges with the territory), but generally with a

potentially unlimited environment from a geographical point of view, thanks, in particular, to the opportunities offered by Web 2.0 technology and the now common practise of building relationships through social media (Mayer, 2005). The concept entails a continuous exchange approach: the team can 'exit from the project' and the external environment can 'enter' into the project.

CONCLUSIONS

The analysis presented offers a theoretical framework to design an entrepreneurial training program according to the open innovation approach and suggests some insights for research, education and business, also based on the preliminary evidence of the first edition of the ProSIT program. The ProSIT program was designed according the proposed open-innovation theoretical framework and its pilot results, evaluated from different stakeholders, confirm the effectiveness and the value of the open-innovation approach for the entrepreneurial education and development.

In terms of scientific research, the first analysis confirms the value of combining the open innovation approach with the theory of entrepreneurship and management education and the opportunity to go on in the analysis . The open innovation framework triggers the design of training courses in accordance with the philosophy of andragogy, intensifying its founding principles such as self-direction and a learning orientation centred on problems or performance (Forrest & Peterson, 2006). This interaction leads to transforming education up to becoming a rhizomatic process where the engagement of students, entrepreneurs, professionals, managers, researchers and institutions is crucial (Mustar, 2009). The main difference between ProSIT and other entrepreneurial programs is that all the stakeholders - students as well - are 'players' with the same level of involvement and proactivity in designing and developing contents and learning processes: all actors focus on the same results, even if they perform different and sometime 'rolling' roles. In more traditional

programs the hierarchical mechanism teacher-student or entrepreneur- stagier has diverse and constrained impacts for innovation in learning.

On the more specific side of the entrepreneurship training, the interaction between open innovation and the philosophy of andragogy leads to the simultaneous activation of complex and multidisciplinary competencies, overcoming boundaries, organizational hierarchies and the decentralization of processes, which is accompanied by the need to give shape and shared meaning to innovation and also ensure its economic sustainability.

From the participants' point of view, the project supports and develops a variety of competencies that are fundamental for entrepreneurial activity, but above all calls for and develops the capacity to think and create in a collective context. This implies a radical change of the mindset of Italian entrepreneurs, moving from a typically individualistic business philosophy to a model where ongoing collaborations are activated, which in addition to relational, organizational and attitudinal competencies requires the shared recognition of its value. This approach also strives and tends to produce a revitalization of the territory, not only thanks to new entrepreneurs, but also involving the entire entrepreneurial and institutional system from the early stages. This approach would therefore appear to also have an effect on the entire Insubria region.

With regard to the relationship between education and companies, numerous stimuli and critical 'ingredients' have emerged for the design of training programs aimed at activating innovation processes.

First, the evidence gathered and analyzed to date on the ProSIT project confirms the importance of training for entrepreneurship where the collective dimension can be sustained both as a way of learning and as a way of generating innovation. The importance of the collective dimension, essential to managing and competing in today's complex economy, suggests its adoption starting from undergraduate courses (Exhibit 6). In this way, young people become accustomed to accepting discontinuity and diversity as intrinsic variables of the workplace and have the

opportunity to develop collective problem-solving and design competencies. All this is a critical component of the mindset of new entrepreneurs (Alegre & Chiva, 2013).

In a training project developed according to this logic, the design of learning must focus on 'open' projects where participants can interact with each other and with the environment 'outside' of the project. The knowledge generated in the process is the result of collaboration and is directly contextualized in individual projects on a first level. That which can be standardized is then further shared between projects and becomes the heritage of the entire work program.

Secondly, also in reference to the characteristics of education that are functional to entrepreneurial effectiveness, the open innovation approach suggests that a significant part of the training content should not be planned but developed in an emerging logic. The evidence gathered appears to confirm the validity of this choice thanks to which project protagonists have the opportunity to draw on training sessions where the form and content are in line with that required to develop the project itself and thus enabling meeting the unexpected and varied technical, managerial and behavioural needs.

The stimuli and the "creative disorder" activated through the open innovation approach and rhizomatic philosophy constitute concrete results and functional solutions through the adoption of a design approach that is typical of more physical-oriented projects requiring the visualization of the output of each phase of the project (Dunne & Martin, 2006). It entails the design of a collaborative environment in which multiple technical competencies operate in a trial-and-error logic to implement a prototype or its engineering. In these situations, innovation develops in the constant exchange of technical knowledge and work progress also achieved with the use of typical co-design technological systems.

Third, the underlying considerations suggest reflecting on the role of instructors, who increasingly become facilitators of the process, in the sense that they trigger collective occasions within and outside of the team, involving all stakeholders of the project and supporting the team in an advisory perspective. In projects that generate strong discontinuity, project coordinators must be

able to absorb the stress of "continuous discontinuity". The instructor becomes the individual who is called on to constantly monitor the engagement of the various internal and external stakeholders. At times, this clashes with the culture of some academic circles but also of many business realities that are often stiffened by operational mental frames and routines. This thinking capacity is essential not only for future entrepreneurial participants but is also an essential requirement for those who design and implement similar training programs.

Finally, this work also suggests some reflections on the role of academia in innovation and learning processes (Perkmann & Walsh, 2007). The debate on this issue is very broad and varied, both nationally and internationally and only marginally concerns the more specific purpose of this contribution. However, some ideas in this regard emerge from this paper and can contribute to the debate. Weick and Sutcliffe (2001) theorized the concept of organizational mindfulness according to which 'conscious organizations' are attentive to the context and at the same time able to intercept and respond to the weak and unexpected signals of the environment. A training project designed according to the open innovation logic recalls the concept of university mindfulness, responding to the development goals of learners in accordance with both the macroeconomic trends (the economic stagnation of Insubria in the case of ProSIT) and with emerging stimuli (the potential, traits and preferences typical of the generation that young entrepreneurs belong to). This translates in parallel into the development of new knowledge for all those involved and in the concrete support of firm innovation processes and the economic fabric to which they belong. The activation of these processes would lead the university to the centre of the socio-economic system, not only as an actor producing knowledge and translating it into management practices, but also as a real activator of innovation processes. Hence, a protagonist able to catalyze energies and resources and design a 'place' of development where enterprises, institutions, workers and citizens come together and collaborate to understand and interpret even weak and controversial signals.

The power of a mindful orientation is that it redirects attention from the expected to the irrelevant, from the confirming to the disconfirming, from the pleasant to the unpleasant, from the more

certain to the less certain, from the explicit to the implicit, from the factual to the probable, and from the consensual to the contested (Weick & Sutcliffe 2001: 44).

LIMITS AND FORTHCOMING RESEARCH STEPS

The preliminary findings provide some empirical cues about the development of training processes in the entrepreneurship domain. They confirm some established results of the andragogy literature, such as the centrality of practice and the relevance of the project-centered approach in the entrepreneurial education, where the involved actors play rolling roles, in a democratic environment. Moreover, new issues emerge from the interactions of entrepreneurial training and open innovation, that stretch the importance of customizing the training paths, such as the relevance of an emerging and rhizomatic training philosophy.

However, the study has various limitations. The most important one is that only partial evidence are presented, because the training program has not been completed yet. The actual actors involved (participants, trainers, entrepreneurs, institutions) are few and the program is at its first edition.

We intend to go on collecting more evidence and performing a more sophisticated data analysis to consolidate our theoretical framework and to understand if it leads to a really new training approach in the entrepreneurship field. A larger sample and more evidence could allow to evolve in different directions considering the various outputs and outcomes of the training experience at different levels.

Different research avenues could be pursued. Useful suggestions could also come from focusing closer attention on the role of technology, especially Web 2.0 solutions, that are widely used by the young generation and that are consistent with the open innovation approach. Furthermore, the social network analysis could offer interesting insights about how relationships occur in effective

entrepreneurial projects at a micro levels of analysis. Finally, the future evidence could be analyzed from the creative literature perspective helping to sustain creative processes within and across organizations.

REFERENCES

- Alegre, J., & Chiva, R. 2013. Linking Entrepreneurial Orientation and Firm Performance: The Role of Organizational Learning Capability and Innovation Performance. *Journal of Small Business Management*, published online: 7th Jan 2013.
- Amabile, T. M. 1996. *Creativity in Context: Update to the social psychology of creativity*. Boulder, CO: Westview Press.
- Amabile, T. M. 1997. Entrepreneurial Creativity Through Motivational Synergy. *Journal of Creative Behavior*, 31(1): 18-26.
- Amatori, F., & Colli, A. 2005. Entrepreneurship: The Italian Story, Crossroads of Entrepreneurship. *International Studies in Entrepreneurship*, 3: 243-261.
- Baumol, W. 2002. *The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*. Princeton: Princeton University Press.
- Bharadwaj, S., & Menon, A. 2000. Making Innovation Happen in Organizations: Individual Creativity Mechanisms, Organizational Creativity Mechanisms or Both? *Journal of Product Innovation Management*, 17(5): 424-34.
- Bissola, R. & Imperatori, B. 2011. Organizing Individual and Collective Creativity. Flying in the face of creativity clichés: some empirical evidences. *Creativity and Innovation Management*, 20(2), 77-89.
- Boni, A.A., Weingart L.R., & Evenson, S. 2009. Innovation in an Academic Setting: Designing and Leading a Business Through Market-Focused, Interdisciplinary Teams. *Academy of Management Learning & Education*, 8(3): 407-417.
- Bougrain, F., & Haudeville, B. 2002. Innovation, collaboration and SMEs internal research capacities. *Research Policy*, 31: 735–747.
- Chesbrough, H. W. 2003. The Era of Open Innovation. *MIT Sloan Management Review*: 35-41.

- Chesbrough, H. W. 2006. *Open Business Models: How to Thrive in the New Innovation Landscape*, Boston, MA: Harvard Business School Press.
- Clarysse, B., Mosey, S., & Lambecht, I. 2009. New trends in technology management education: a view from Europe. *Academy of Management Learning and Education*, 8(3): 427–443.
- Compagno, C., Pittino, D., & Visintin, F. 2005. Corporate governance and advanced forms of internationalisation in Italian SMEs. *International Journal of Globalisation and Small Business*, 1(2): 168-182.
- Corbetta, G., Huse, M., & Ravasi, D. (Eds.) 2004. *Crossroads of Entrepreneurship. International Studies in Entrepreneurship*, Vol.3, Springer.
- Dahlander, L., & Gann, D. 2010. How open is innovation? *Research Policy*, 39(6): 699-709.
- Deleuze, G., & Guattari, F. 1987. *A Thousand Plateaus: Capitalism & Schizophrenia*. Minneapolis: University of Minnesota Press.
- DeWalt, K. M., & DeWalt, B. R. 2002. *Participant observation: a guide for fieldworkers*. Walnut Creek, CA: AltaMira Press.
- Dubois, A., & Gadde, L. E. 2002. Systematic combining—an abductive approach to case research. *Journal of Business Research*, 55(7): 553–560.
- Dunne, D., & Martin, R. 2006. Design thinking and how it will change management education: an interview and discussion. *Academy of Management Learning & Education*, 5(4), 512–23.
- Forrest, S.P., & Peterson, T.O. 2006. It's Called Andragogy. *Academy of Management & Education*, 5(1): 119-121.
- Gann, D. M. 2005. Open Innovation: The new imperative for creating and profiting from technology. *Research Policy*, 34(1): 122–123.

- George, J. M. 2007. Creativity in Organizations. *The Academy of Management Annals* 1(1): 439-77.
- Giannopoulou, E., Yström, A., & Ollila, S. 2011. Turning Open Innovation into Practice: Open Innovation Research through the Lens of Managers. *International Journal of Innovation Management*, 15(3): 505–524.
- Gilson, L. L., Mathieu, J. E., Shalley, C. E., & Ruddy, T. M. 2005. Creativity and standardization: Complementary or conflicting drivers of team effectiveness? *Academy of Management Journal*, 48(3): 521–531.
- Greene, P. G., & Rice, M. P. 2007. *Entrepreneurship Education*. Cheltenham: Edward Elgar.
- Greve, A., & Salaff, J. W. 2003. Social Networks and Entrepreneurship. *Entrepreneurship Theory & Practice*, 28(1): 1–22.
- Gubitta, P., & Gianecchini, M. 2002. Governance and Flexibility in family owned SME. *Family Business Review*, 15(4): 277-299.
- Gully, S. M., Devine D. J., & Whitney D. 1995. A meta-analysis of cohesion and performance: Effects of level of analysis and task interdependence. *Small Group Research*, 26(4): 497-520.
- Hargadon, A.B., & Bechky, B.A. 2006. When Collections of Creatives Become Creative Teams: A Field Study of Problem Solving at Work. *Organization Science*, 17(4): 484-500.
- Helfat, C.E., & Quinn, J.B. 2006. Open innovation. The new 442 Academy of Management Learning & Education September imperative for creating and profiting from technology. *Academy of Management Perspectives*, 20(1): 86–88.
- Herzog, P. & Leker, J. 2010. Open and closed innovation - Different innovation cultures for different strategies. *International Journal of Technology Management*, 52(3-4): 322-343.
- Herzog, P. 2008. *Open and Closed Innovation - Different Cultures for Different Strategies*, Wiesbaden: Gabler Edition Wissenschaft.

- Huizingh, E.K.R.E. 2011. Open innovation: State of the art and future perspectives. *Technovation*, 31(1): 2-9.
- Hunter, S. T., Bedell, K. E., & Mumford, M. D. 2007. Climate for Creativity: A Quantitative Review, *Creativity Research Journal*, 19(1): 69-90.
- Lazzarotti, V. & Manzini, R. 2009. Different modes of open innovation: a theoretical framework and an empirical study. *International Journal of Innovation Management*, 13(4): 615-636.
- Lee, S.Y, Florida, R., & Acs, Z.J. 2004. Creativity and Entrepreneurship: A Regional Analysis of New Firm Formation. *Regional Studies*, 38: 879-91.
- Leenders, R.Th.A.J., van Engelen, J.L.M., & Kratzer, J. 2007. Systematic Design Methods and the Creative Performance of New Product Teams: Do they Contradict or Complement Each Other? *Journal of Product Innovation and Management*, 24(2) : 166–79.
- Magadley, W., & Birdi, K. 2009. Innovation labs: An investigation into the use of physical spaces to enhance organisational creativity. *Creativity and Innovation Management*, 18: 315-325.
- Martin, R. L. 2009. *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. Boston, MA: Harvard Business School Press.
- Mattiacci, A., Simoni, C. & Zanni, L. 2008. Italian SME international strategies: state-of-the-art and some empirical evidences, in Dana, L.P., Welpe, I., Han, M. & Ratten, V. (Eds), *Handbook of Research on European Business and Entrepreneurship*. Cheltenham: Edward Elgar: 337-365.
- Mayer, R.E. 2005. *The Cambridge handbook of multimedia learning*. New York, NY: Cambridge University Press.
- Mumford, M.D., Scott, G.M., Gaddis, B., & Strange, J.M. 2002. Leading creative people: orchestrating expertise and relationships. *Leadership Quarterly*, 13(6): 705–750.

- Mustar, P. 2009. Technology management education: Innovation and entrepreneurship at MINES ParisTech, a leading French engineering school. *Academy of Management Learning & Education*, 8(3): 418–425.
- Ollila, S. & Elmquist, M. 2011. Managing Open Innovation: Exploring Challenges at the Interfaces of an Open Innovation Arena. *Creativity and Innovation Management*, 20(4): 273-283.
- Perkmann, M., & Walsh, K. 2007. University-industry relationship and open innovation: towards a research agenda. *International Journal of Management Reviews*, 9(4): 259-280.
- Proserpio, L., & Gioia, D. A. 2007. Teaching the Virtual Generation. *Academy of Management Learning & Education*, 6(1): 69-80.
- Scellato, G., & Ughetto, E. 2010. The Basel II reform and the provision of the finance for R&D activities in SMEs: An analysis of the sample of Italian companies. *International Small Business Journal*, 28 (1): 65-89.
- Schroll, A., & Mild, A. 2011. Open innovation modes and the role of internal R&D: An empirical study on open innovation adoption in Europe. *European Journal of Innovation Management*, 14 (4): 475-495.
- Schweitzer, J., Edwards, M., Nikolova, N., & Nicolai, C. 2012. Designing Entrepreneurial Work Environments: Exploring Emergent Design Processes. *27th EGOS Colloquium*, July 5-7, Helsinki.
- Strange, J.M. 2002. Leading creative people: orchestrating expertise and relationships. *Leadership Quarterly*, 13(6): 705–750.
- Strauss, W. & Howe, N. 1991. *Generations: The History of America's Future, 1584 to 2069*. New York, NY: William Morrow.

- Strauss, W., Howe, N., & Markiewicz, P. 2006. *Millennials and the pop culture: Strategies for a new generation of consumers in music, movies, television, the Internet, and video games*. Great Falls VA: Lifecourse Associates.
- Teal, R. 2010. Developing a (Non-linear) Practice of Design Thinking. *Journal of Design & Art Education*, 29(3): 294-302.
- Terjesen, S., Vinnicombe, S., & Freeman, C. 2007. Attracting Generation Y graduates: Organisational attributes, likelihood to apply and sex differences. *Career Development International*, 12(6): 504 – 522.
- Ungaretti, T., Chomowicz, P., Canniffe, B.J., Johnson, B., Weiss, E., Dunn, K., & Cropper, C. 2008. Business + Design: Exploring a Competitive Edge for Business Thinking. *SAM Advanced Management Journal*: 4-43.
- Van Stel, A., Carree, M., & Thurik, R. 2005. The Effect of Entrepreneurial Activity on National Economic Growth. *Small Business Economics*, 24(3): 311-321.
- Ward, T.B. 2004. Cognition, creativity, and entrepreneurship. *Journal of Business Venturing*, 19(2): 173–188.
- Weick, K. E., & Sutcliffe, K.M. 2001. *Managing the Unexpected*. San Francisco, CA: Jossey-Bass.
- Woodman, R. W., Sawyer J. E., & Griffin R. W. 1993. Toward a theory of organizational creativity. *Academy of Management Review*, 18(2): 293-321.

FIGURES & TABLES

Table 1 - Some ProSIT Projects

Sector of the proposing firm	Summary of the innovative idea
Virtual technology/IT	Integration of devices, prototype in virtual environment
Fire management	New services based on a data base systems for measuring the effects of fire on products and structures
Biotechnology	Innovative packaging for food, to thread as dump
Industrial machinery and equipment	Study of industrial furnace for wire production and commercialisation
Textile	Technical drawings storage method
ICT service	Needs/use optimization software for SMEs
Energy	Heating elements (prototype)
Public Institution	Process to develop the SME's capacity to access to credit and financial resources
Public Enterprise	Fund raising and optimization process of locations of merit for local tourism and cultural development

Figure 1 – ProSIT Actors

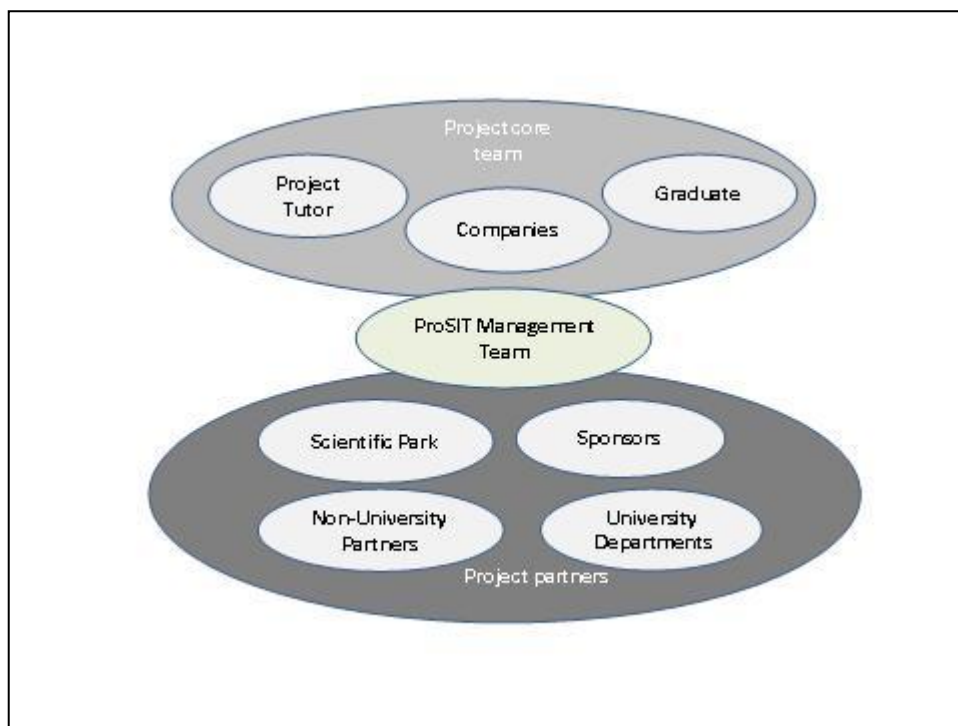


Figure 2 – ProSIT: Outcomes at Different Levels

