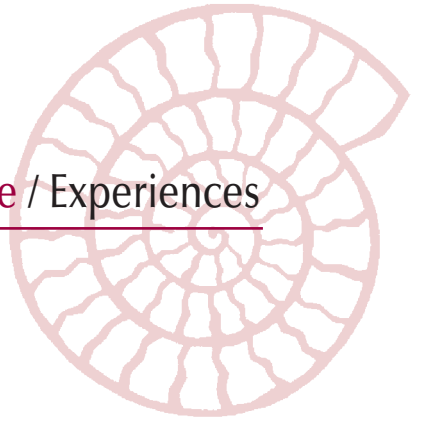



Esperienze / Experiences





Entrepreneurship teaching in VET through the Change Laboratory

L'insegnamento dell'imprenditorialità nella Formazione ed Educazione Professionale attraverso il Change Laboratory

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ABSTRACT

This article is about entrepreneurship teaching in Vocational Education and Training. It is argued that the Change Laboratory within the framework of Developmental Work Research is an effective and viable approach to entrepreneurship teaching. There are three main reasons for this. First, the agency embedded in the Laboratory triggers the participants' sense of initiative. Second, the Change Laboratory is an ideal location for implementing the European agenda of introducing entrepreneurship into the vocational curriculum at the local level, thus allowing sustainability. Third, the Laboratory is a space where the individual's abilities connected to the European competence called "sense of initiative and entrepreneurship" is challenged and enhanced.

Questo articolo riguarda l'insegnamento dell'imprenditoria nella Formazione ed Educazione Professionale. Si sostiene che il Change Laboratory compreso nel quadro della Developmental Work Research è un approccio efficace e praticabile all'insegnamento dell'imprenditoria. Tre ragioni sono a sostegno di questa tesi. In primo luogo, l'attività prevista dal laboratorio stimola il senso di iniziativa dei partecipanti. In secondo luogo, il Change Laboratory figura come luogo ideale per l'implementazione dell'agenda europea orientata all'introduzione dell'imprenditorialità nei curricula professionali a livello locale, consentendone così l'esercizio sostenibile. Infine, il Laboratorio è uno spazio ove le capacità individuali connesse alla competenza europea denominata "senso di iniziativa e imprenditorialità" sono messe alla prova e migliorate.

KEYWORDS

Vocational Education and Training (VET), Change Laboratory, Sense of Initiative and Entrepreneurship, Entrepreneurship Teaching, Cultural Historical Activity Theory (CHAT).

Formazione ed Educazione Professionale, Change Laboratory, Senso di iniziativa e imprenditorialità, Insegnamento dell'imprenditoria, Teoria dell'Attività Storico-Culturale

In this article we would like to argue for an alternative model of Entrepreneurship education based on the Change Laboratory. We start with an overview of European Union policies regarding the competence of Sense of Initiative and Entrepreneurship, as well as entrepreneurship teaching. In the second section, we consider the context of VET delivery in European secondary schools, and in the third the Change Laboratory and its fundamental principles are described. The fourth part shows two possible applications of the Change Laboratories in a VET school: one could be useful in implementing the recommendations for entrepreneurship found in European policy in the local context, and the other in improving the student's sense of initiative and "intrapreneurship" (innovation in existing organisations) in the space located between school and work experience. In the final section we draw conclusions.

A typical model for entrepreneurship education based on experiential learning is the one of Heinonen and Poikkijoki (2006). Also Tynjälä (2007) has proposed a model of Integrative Pedagogy aiming at developing vocational and professional expertise in VET. However, we think that the shift from experiential learning to expansive learning within Cultural Historical Activity Theory (CHAT) has some advantages. First, CHAT does not restrict the focus of action on the individual, but on the system of activity, its rules, community, division of labour, tools. Next, action is seen as object oriented, thus imbued with purpose. The third generation of Activity Theory expands its objects to multiple interacting systems of activity, as is the case in most Vocational Education and Training settings, where school and workplace cooperate on a mutual object, the learning outcomes of the VET student.

We argue that applying the Change Laboratory in VET can bring three orders of benefits. The changes induced by a cycle of expansive learning are more likely to be sustainable in the local setting over long periods. Next, the agency embedded in the Laboratory will boost the participants' sense of initiative, both teachers and students. And finally, the Change Laboratory provides a means to improve the skills relating to initiative and entrepreneurship, such as teamwork, project management and creativity.

1. Entrepreneurship in Europe and in VET

As far back as 1993, the White Paper called "Growth, Competitiveness and Employment" (European Commission 1993) was considering the problem of unemployment in Europe. The main focus of the White Paper was on personal employability, which more and more is decided by the knowledge that the individual is able to gain. It argued that society needs to transform into a knowledge society, where each individual is responsible for the construction of their own professionalism. The White Paper also pointed out the importance for the individual of being able to access learning at every stage of life, in a lifelong learning perspective.

More recently, the European Commission (2006) suggested a list of eight key competencies for lifelong learning. As globalization continues to confront the European Union with new challenges, each EU citizen needs a variety of key competencies to adapt in a flexible way to a rapidly changing world. Competencies are defined as a combination of knowledge, skills and attitudes appropriate to the context, and are needed by all individuals for personal fulfilment, development, active citizenship, social inclusion and employment.

Among those competencies, one stands out for its role in combating unemployment; it is the Sense of Initiative and Entrepreneurship. One of the main targets of the Agenda for Europe 2020 is in fact the raising of the employment rate of the population aged 20–64 from the current 69% to at least 75%. Further, there is also a flagship initiative for new skills and jobs in the Agenda for Europe 2020 policy. This initiative aims at modernising labour markets by facilitating labour mobility and ensuring the development of skills throughout the lifecycle. The political imperative in Europe for the development of an ‘enterprise culture’ is mainly attributed to the pressures for greater international competitiveness due to globalization (Gibb 2002).

According to the European Union’s definition (European Commission 2006) the Sense of Initiative and Entrepreneurship refers to the individual’s ability to turn ideas into action, and should be regarded as a mindset rather than a mere technical skill. It includes creativity, innovation and risk-taking, as well as the ability to manage objectives and to plan in order to achieve certain targets. Creativity is perceived in European policies as the prime source for innovation, which in turn is acknowledged as the main driver of sustainable economic development (European Commission 2010).

According to Heinonen and Poikkijoki (2006) though, entrepreneurship does not necessarily imply the creation of new firms, but takes place also in existing organizations. This is called “intrapreneurship”, and is defined as entrepreneurship within an existing organization, referring to emergent intentions and behaviours deviating from the accustomed way of doing business. Not only can the process of entrepreneurship create a new business venture, but also other innovative activities within the same enterprise.

Moreover, a dynamic economy, able to create the necessary jobs, will require a number of young people willing and able to become entrepreneurs (European Commission 2012, 4). Because education is a key factor to shaping young people’s attitudes, skills and culture, it is crucial that entrepreneurship education is addressed from an early age. Among the specific learning outcomes envisaged for such programs are:

- knowledge of career opportunities and the world of work, the business organization and its processes;
- skills like communication, presentation, planning skills and teamwork as well as practical exploitation of entrepreneurial opportunities;
- attitudes such as self-awareness and self confidence, taking the initiative and risk-taking, critical thinking, creativity and problem solving¹.

Whilst “regular” education is focused on supporting the development of knowledge and intellect, entrepreneurship education concentrates on human beings in their totality (Heinonen & Poikkijoki 2006). Traditional methods should be thus complemented with entrepreneurial approaches, which in turn require learning by doing and providing opportunities to participate in, as well as shaping the learning situation.

1 This list in the report has been developed from the reflective model for entrepreneurship teaching elaborated by Heinonen and Poikkijoki (2006).

Heinonen and Poikkijoki draw from Kolb's model, according to which reflective observation through abstract conceptualization and active experimentation lead to concrete personal experience. The entrepreneurial-directed approach is based on the idea of circles of experiential learning, in which new activity produces a new experience and new thinking through reflection. A lesson consists of a series of different activities, between which the investigation of reflection, assessment and thinking are of utmost importance. The task of the teacher is thus to enhance the students' abilities to reflect on their own experiences and put them into a wider context, as well as to provide them with the possibility to draw their own theoretical interpretations (Gibb 2002).

Moving to VET, education for entrepreneurship can be particularly effective in initial vocational training, as students are close to entering the world of work, and self-employment may be a valuable option for them. Although many scattered initiatives have been taken throughout Europe, there is a general perception that there is still a gap to be filled in the curricula for vocational education in a majority of European countries. Some major reasons for the gap identified are the following (European Commission 2009):

- entrepreneurship is not included in all parts of the VET system;
- student participation is limited;
- teaching methods are ineffective;
- the practical element of entrepreneurship is often missing;
- teachers are not fully competent;
- entrepreneurship is not linked to specific training subjects or professions, and business people are sometimes not sufficiently involved.

Tynjälä and Gibels (2012) draw on the concept of professional expertise from school to work as it could be the case in VET. Such expertise can be described as consisting of four basic elements which are tightly integrated with each other. Those are:

- 1) factual, conceptual and theoretical knowledge;
- 2) experiential and practical knowledge;
- 3) regulative knowledge;
- 4) sociocultural knowledge.

Factual and theoretical knowledge, including disciplinary knowledge, is the basic element of the professional fields; it deals with universal and explicit knowledge learnt from books. The second element involves expertise and practical knowledge, which can only be enhanced through practical experience. Regulative knowledge has to do with self/knowledge and the regulation of activities, thus recalling Kolb's experiential model. Sociocultural knowledge is embedded in social practices, environments, tools and devices thus framing the other types of knowledge. It should also be noted that in this classification there is no distinction between domain specific versus generic knowledge and skills. As knowledge consists of integrated elements of theoretical, practical, regulative and sociocultural knowledge, the developments of expertise also calls for the integration of these elements (Tynjälä 2007). Besides consisting of four different types of knowledge, there are other features that make up professional expertise, such as progressive problem solving. And finally expert work is highly collaborative and

transformative in nature. This model is called Integrative Pedagogy (Tynjälä & Gibels 2012).

According to Guile (2006), it is necessary to move beyond the Cartesian split between vocational curricula and workplace practice. It is now possible to formulate a non-dualistic conception of the relation between mind and word that allows one to grasp the interdependency of theory and practice through the concept of workplace learning. The Vygostkian difference between theoretical and abstract concepts does not reflect a dualism, but rather the different outcomes that flow from the specialized activities in which people engage. The distinction between functional and formal concepts may be misinterpreted as implying a form of hierarchy (Engeström & Sannino 2012).

Further, the concept of competence should be broadened to encompass a horizontal dimension, which involves boundary crossing (Engeström, Engeström, & Karkkainen 1995). As a matter of fact, practitioners move across boundaries to seek and give help, to find information and tools wherever they happen to be available. Boundaries are defined as sociocultural differences that give rise to discontinuities in interaction and action (Akkerman & Bakker 2011), as could be the case with VET students moving from school to work experience. Crossing boundaries involves encountering difference, entering into a non-familiar space and where the person is to some extent unqualified. To overcome such a gap, boundary crossing requires the formation of new mediating concepts (Engeström, Engeström, & Karkkainen 1995).

2. The context of VET delivery

Modern secondary schools are subject to numerous and complex demands, which include addressing skills shortages, increasing the participation and outcomes of equity groups and contributing to social cohesion, economic competitiveness, entrepreneurship and well-being. Yet, Durkheim (1901) argued over a century ago “that secondary education has never had an essentially vocational goal” and more recent scholars have highlighted that applied learning sits at the bottom of a curriculum hierarchy of subjects in secondary schools (Goodson 1983; Winch & Clarke 2003). It is evident that vocational and applied learning in schools occupies a place within an educational and cultural hierarchy that is socially and institutionally biased. In Italy this is manifested in the hierarchy of upper secondary institutions – *licei, istituti tecnici and istituti professionali* – including the differentiation which occurs within the curriculum between these different settings.

Research has highlighted the role of applied learning in democratising access to the curriculum, improving the learning experiences of all students and accommodating the broader range of learning needs which arose from the surge towards near universal participation in secondary schools across OECD nations in the early 1990s. There is also some evidence of the efficacy of applied learning in increasing school completion rates for low achievers and improving their transition to work (Polesel *et al.* 2004; Polesel 2010).

However, vocational education and training is also associated with social selection, both in Italy (Fini 2007) and elsewhere (Polesel, 2008). If vocational and applied learning programs are becoming the “pathway of the poor” as suggested by Polesel (2010), then it is absolutely essential that these programs provide effec-

tive pathways and do not become residualised options of last resort. Moreover, vocational and applied learning typically is delivered in multiple locations – not just schools – and through more complex relationships between students, teachers, external providers and employers. Yet, the institutional emphasis in schools upon curricular and assessment regimes associated with university entry may adversely affect these relationships. This means that some schools struggle to build capacity for the delivery of programs (Polesel 2008) and to form and conduct effective partnerships with the world of work (Starr 2007). These programs create demands upon teachers for changes in practice and in their relationships with students, and the success of these changes depends heavily on external collaboration to effectively implement applied learning in a school context. The Change Laboratory constitutes an intervention deep into the relationships which are crucial to these applied learning programs and their impact on the learning of young people, attempting to reconcile the tensions between different institutional and pedagogical traditions. The strength of the theoretical framework of Cultural Historical Activity Theory (CHAT) is that it provides a tool for bridging the uneasy relationship between school and work settings from the point of view of the actors, with a particular focus on developing the crucial competency of entrepreneurship in young people.

3. The Change Laboratory

The Change Laboratory is an interventionist method for transforming work used by the researcher within the theoretical framework of developmental work research and Cultural Historical Activity Theory (CHAT). It aims at intensive, deep transformations and continuous improvement (Engeström, Virkkunen, Helle, Pihlaja & Poikela 1996).

The idea is to arrange on the shop floor a space in which there is a rich set of instruments to analyze problems of work activity, and to construct new models of work practice (Engeström *et al.* 1996). Working practitioners and managers in the unit, together with the researcher, conduct five to ten sessions, often with a follow-up after a few months. When possible, other actors related to the activity (such as customers and providers) take part in the meetings as well. The Laboratory is built on ethnographic data from the activity setting in which it is carried out. Change Laboratories are also conducted as boundary crossing laboratories with representatives from two interacting activity systems (Engeström & Sannino 2010).

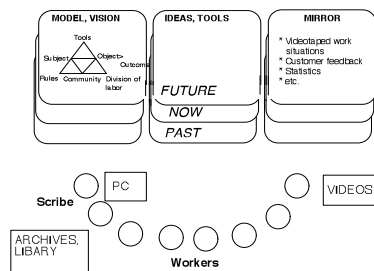


Fig. 1. Layout of the Change Laboratory

The central tool is a three-dimensional set of surfaces to represent the work activity (Engeström *et al.* 1996). The horizontal dimension illustrates different levels of abstraction and theoretical generalization: on one side the mirror surface is used to represent and examine experiences from work practice, especially problematic situations, but also novel innovative solutions. Videotaped work as well as stories, interviews and statistics are used in the mirror. On the other side, the model/vision surface is utilized for theoretical tools and conceptual analysis. Engeström's complex triangular model is shown as an heuristic tool to analyze the system of activity and the different interconnections within. In addition, a general model of the steps of an expansive learning cycle is used, to enable workers to move through the current and projected next stage of their activity. The third surface in the middle is reserved for ideas and tools, as the participants move between the experiential mirror and the theoretical model, also producing intermediate ideas. The vertical dimension of the surfaces represents movement in time, between the past, the present and the future. Work starts with the mirror of the present situation, and then moves to trace the origins of current problems through the mirror materials. The following step is to envision the future model of the activity.

The two foundational epistemological principles of the Change are: the double stimulation and ascending from the abstract to the Concrete (Sannino 2011).

The former principle stems from Vygotsky's theorization. According to this social scientist (cited in Sannino 2011, 585) through this process the subject transforms a situation - which is initially meaningless for them – into one with a clear meaning. Further, double stimulation is considered to be the principle behind the genesis of will. In this process, the first stimulus is the problem itself. Humankind utilizes external artifacts turned into signs by filling them with significant meaning. Those signs are then used by the individual as a second stimulus to gain control over their actions and to construct a new understanding of the initial problem. Within the Change Laboratory, while the first stimulus could be the self or co-constructed conflictual problem, the second one could be provided by the researcher, or be created by the participants themselves. The second stimulus could be turned into a mediating tool and internalized by the participants, hence helping in the resolution of the controversial problem. As a matter of fact, Vygotsky described the artificial mediated nature of intention as follows: «The person, using the power of things and stimuli, controls their own behavior through them, grouping them, putting them together, and sorting them. In other words, the great uniqueness of the will consists of man having no power over his own behavior other than the power that things have over his behavior» (cited in Engeström 2011, 8).

To achieve this aim, the triangle of Engeström may be used at the beginning as a second stimulus, thus allowing the participants to find interconnections among the rules, the division of labour, the tools, the community, the subject and the object. However, while the participants may use the offered template, they probably would switch to a model or instrument of their own, or modify it and fill it with their content and meaning (Engeström 2011).

Formative interventions, based on the Vygotsky's principle of double stimulation, are characterized by the following points: the unity of analysis is the collective activity system; the contradictions are a source of change and development; agency is a crucial layer of causality; and the transformation of the practice is seen as a form of expansive concept formation (Sannino 2011).

As far as the second founding principle of the Change Laboratory is concerned, namely ascending from the abstract to the concrete, it was first put into

practice by Davidov (cited in Sannino 2011, 586), and may be seen behind the genesis of a theoretical generalization. The essence of an object is grasped by tracing and reproducing theoretically the logic of the development of its historical formulation through the merging and resolution of its inner contradictions (Engeström & Sannino 2010). A new idea or concept is initially produced in the form of an abstract and simple relationship, a germ cell. This abstraction is then progressively enriched and transformed into a concrete system of multiple and constantly developing manifestations.

In the Change Laboratory, this principle triggers the concept formation to generate a shared solution to the conflictual problem. From its original abstract principle, one can observe the different material manifestations, and even think about new variations. However, theoretical generalization requires problematic solutions in order to find the germ cell behind them. This model of generalization has a strong learning potential because it helps the subjects to think dialectally about their practices, and to find connections with a variety of phenomena that initially remained in the shadows (Sannino 2011).

Ascending from the abstract to the concrete is reached through specific learning actions, forming together an expansive cycle. An ideal typical sequence may be the following (Engeström & Sannino 2010):

- questioning, criticizing or rejecting some aspects of the accepted practice;
- analysing the present situation. This involves mental, discursive or practical transformation of the situation in order to find the causes or its mechanism;
- modelling the newly found explanatory relationship in a publicly observable and transmissible medium;
- examining the model, running or experimenting the model to fully understand its dynamics;
- implementing the model by means of practical applications;
- reflecting on and evaluating the process;
- consolidating the outcomes of the process into a new stable form of practice.

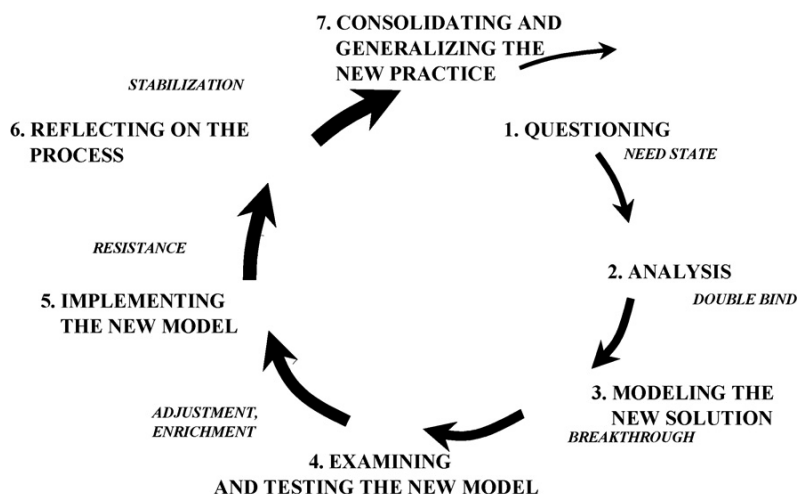


Fig. 2. A typical cycle of expansive learning (from Engeström & Sannino 2010).

4. Teaching Entrepreneurship through the Change Laboratory

Entrepreneurship education can be integrated into general education in various ways, for example through a cross curricular approach. It can also be integrated into existing subjects, or introduced as a separate curriculum subject (European Commission 2012). According to the report *Entrepreneurship in Vocational Training* (European Commission 2009), there are a number of recommendations for action that might be put into practice in business organization and vocational schools to increase students' and teachers' entrepreneurial skills. For example, schools should establish the role of an enterprise champion, and extend entrepreneurship to all fields of vocational education. Schools should also present entrepreneurship in a practical way in their VET courses, and involve business in the entrepreneurial process.

Despite the fact that all these suggestions look reasonable, the implementation of European recommendation into local contexts often proves difficult. As Cole (1996) points out, many didactic innovations are tried but then they are not able to survive: the new programs are tolerated by the social institutions as long as they are financed. Once the external funds finish, the internal resources are insufficient to sustain them. As noted by Heinonen and Poikkijoki (2006, 88): «The emphasis should be on the exploitation of opportunities to promote long-lasting entrepreneurial behaviour rather than one-off experiences.»

In contrast, Activity Theory stands as an activist theory of development of practices, emphasising that theory is not meant to simply analyse and explain the world, but also to generate new practices and promote change (Sannino 2011). For formative interventions, the key implication of activity system as unity of analysis is that interventions need to be embedded and contextualized in the participants' meaningful life activity (Engeström 2011): an intervention that limits itself to the transformation of actions and ignores the motivational dynamics stemming from the object of the activity may be technically effective in the short run, but is unlikely to have a durable formative influence in the long run.

We suggest that a Change Laboratory could help to assess how to apply the European recommendations discussed above into specific VET settings. This could encompass the range of actors involved in the transformation, such as VET teachers, those responsible for VET delivery and local entrepreneurs. Intention is a necessary but not sufficient condition for entrepreneurship, some kind of a triggering event is needed (Heinonen & Poikkijoki 2006). Such event should be able to engage the participants. To do so, it should be taken from their experience and used within the laboratory as mirror material, thus working as first stimulus in double stimulation. During the meetings the participants could discuss critical incidents gathered from the field and documents on how to improve entrepreneurship education. Also the historical perspective of the VET courses -for example in term of curriculum, or the history of the relationship with the enterprises - might be taken into account.

Different stakeholders see differently the critical problem in the system of activity, and this would trigger a conflict of ideas. The highly mediating environment of the Change Laboratory would help to find a solution. A cycle of expansive learning could take place starting from questioning and analysing the reality, and moving from the present to the past, to trace the roots of the present problem. The participants could then move to the future to envision a possible solution, on how to build the future generation of entrepreneurial students.

During this process the participants would need to create shared mental processes, moving through diverse layers of abstractions: from the concrete level of the mirror materials to the abstract layer of the new model of activity, moving through the intermediate level of the ideas-tools. The formation and change of functional concepts involves confrontation and contestation as well as negotiation and blending (Engeström & Sannino 2012). The new model should be then put into practice, adapted and improved, thus ensuring durability.

A variation of the Change Laboratory, the Boundary Crossing Laboratory, could be used to enhance the VET students' learning from school to work experience. Besides the students, VET teachers, the school coordinator of VET and the students' work tutors, should also take part in the meetings. Further, the mirror materials could come from the problems students are having in the space between school and work. For example, what they learn at school may not be relevant in their work placement or vice versa. As a matter of fact, students often perceive a mismatch between what they are expected to learn in the curriculum and what they find that they need to know as trainees or on work placements. It may also be that employers find that their trainees don't have the knowledge they need to cope with the production demands, or that the educational aims of employers and teachers are in conflict (Young 2001). The historical analysis could be about the changes to the VET course in the last years, or the curriculum during the school year. This way the students could improve their active participation and agency. Expansive learning here could mean to improve the quality of ties between enterprise and school, which is one of the most important European recommendations regarding entrepreneurship education (European Commission 2009).

Both the Change Laboratory and the boundary crossing laboratory are intended to enhance the participants' agency and will, thus improving their initiative, which is the main habit connected to the European competence of the sense of initiative and entrepreneurship. In the processes of social change, Engeström (2011) considers the process of causality, and finds three possible layers, namely interpretative, contradictory and agentive. In the first layer, the interpretative one, human beings do not merely react to physical objects, they also behave according to their activities, interpretations and logics. In the second layer, humans not only interpret, they also face contradictions between multiple motives. The last layer for causality is the agentive one, which releases the human potential for agency and for intentional collective and individual actions aimed at transforming the activity.

Breaking away from pre-existing patterns of activity requires expansive agency. Double stimulation is essentially a mechanism to build concepts, agency and will (Engeström 2011). In Change Laboratory interventions, five forms of emergent agency have been identified (Engeström & Sannino 2010). The first is resisting the interventionist or the management, and may take the form of criticism, questioning and opposition. The second is explicating new possibilities or potential in the activity, and might consist of characterizing the problematic object as a source of new possibilities. The third form of agency deals with envisioning new patterns or models of activity. This may include preliminary partial suggestions. The fourth is committing to concrete actions aimed at changing the activity, and the last is taking consequential actions to change the activity. Concerning the first type of agency, according to Sannino (2009) the term resistance is commonly used with a negative connotation to indicate an oppositional action to something that one disagrees with. However, there are studies showing that

rather than being connected with conservatism and disruptive opposition, resistance might manifest early forms of agency, thus becoming self-initiative. While this first kind of agency may be considered an early stage, the other four types are certainly connected to the individual and group sense of initiative.

In regular training the participants are expected to execute the intervention without resistance, and difficulties and execution are interpreted as weaknesses of the design to be corrected. In the Change Laboratory, on the other hand, the contests and course of the intervention are negotiated with the participants and the shape of the intervention is eventually up to them. Hence, double stimulation implies that the participants gain agency and take control of the formative process (Engeström 2011). In other words, a key outcome of the Change Laboratory is initiative among the participants.

Besides being a privileged place to improve people's agency and sense of initiative, the Change Laboratory could be seen as a place where competence can be improved. Ahonen, Engeström, and Virkkunen (2000) had already pointed out that quality and form of competencies change accordingly to the historical form of work. Moreover, the competencies are qualitatively different in different forms of work, and are produced in different ways. In the emerging form of work typical of our western societies, called by Engeström Co-configuration and characterized by innovation driven production, competencies in the process of work enhancement are created by the constant co-operative analysis of the problem in the production process, and by developing and experimenting with new solutions in the quality circles. During the Change Laboratory, the participants learn to understand the interrelations between the different activities, to identify specific needs for further learning, to build a network of interrelated actors into a community consciously developing its competence.

From this point of view, besides working on the collective Zone of Proximal Development, the Change Laboratory is also believed to work on the individual Zone of Proximal Development. In other words, there is a group of knowledge, skills, and attitudes intrinsic to the Change Laboratory which constitutes the competence of the sense of initiative. These are:

- Knowledge of the way the enterprise and school work in order to be able to exploit opportunities;
- Skills: team work; communicating their ideas to others; managing conflicts (negotiate); planning, analysing; project work; problem solving;
- Attitudes: creativity; resourcefulness; taking the initiative, risk-taking.

As far as the knowledge of the processes connected to enterprise and school is concerned, these may be tackled in the phase of the expansive cycle called "analysing the reality". This knowledge needed to find possible opportunities is embedded in the definition of Boundary Crossing, according Engeström *et al.* (1995, 332): «practitioners must move across boundaries to seek and give help, to find information and tools wherever they happen to be available». This knowledge is thus essential in VET, where students and teachers continuously cross the boundaries between school and work, and the Change Laboratory can be a valuable medium to achieve this.

Moving to the skills and the attitudes connected to the sense of initiative, our claim is that they are also naturally embedded into the Change Laboratory. Tynjälä and Gibels (2012) point out that society requires experts capable of commu-

nicating, working in teams, sharing knowledge with colleagues in pursuit of a common goal, and looking for new knowledge applicable to new situations. In their model based on Integrative Pedagogy, the authors claim that the process of integrating theory, practice, and self-regulation can be seen as a problem-solving process in which students need to solve both practical problems and related conceptual problems. That is certainly the case with the Change Laboratory, where participants face a problem, and find new ways to tackle it concretely through expansive learning and the construction of a shared mental concept.

One of the most important things in teaching entrepreneurship is the active role of the students in the learning process. Moreover, this involves co-learning between teachers and students, given that the teacher also has to act in an entrepreneurial way in discovering opportunities and innovatively exploiting them (Heinonen & Poikkijoki 2006). In the Change Laboratory, active participation and creativity are certainly solicited in the problem solving process characterizing the cycle of expansive learning.

Heinonen and Poikkijoki (2006) call for the following attributes connected to entrepreneurship: an innovative approach to problem solving, a high readiness for change and creativity. All these attributes are embedded in the highly mediating atmosphere of the Change Laboratory, where the participants generate a new shared mental concept stemming from the conflictual problem they are experiencing. Within the CHAT framework, Edwards (2006) has written on teamwork. The concept of relational agency is offered as an enhanced version of personal agency, and is described as the capacity to align one's thought and actions with those of others. This concept is useful when attempting to understand how people are able to come together to interpret a problem and to respond to it. The Change Laboratory could thus be seen as a place where the participants develop their relational agency, in other words, their ability to cooperate with others.

Conclusions

It has been argued that entrepreneurship has never been more important than it is today (CEDEFOP 2011). The economic crisis and the resulting high level of unemployment across Europe have further emphasised the need for sustainable job creation and for increased EU competitiveness. The complex and insecure economic situation calls for new problem solving capabilities. Innovative and entrepreneurial people can contribute to all domains and sector of society.

Until recently, the development of entrepreneurship teaching has been mainly bottom-up; this means that there is a certain degree of diversity in entrepreneurship practice in Europe. This is because education and training systems have traditionally focused on equipping young people with skills, knowledge and tools that enable them to identify and secure jobs, rather than the capacity to show initiative and seek possible opportunities.

Entrepreneurship programs can have various objectives, such as (Volkman *et al.* 2009): developing entrepreneurial drive among students, developing the entrepreneurial ability to identify and exploit opportunities; and training students in the skills they need to set up a business and manage its growth. In all of these contexts, it is important to encourage students to think and act entrepreneurially as well as ethically and in a socially responsible manner.

Entrepreneurship is a particularly important issue for the providers of voca-

tional education and training because the vocational nature of learning means that entrepreneurship, and self-employment in particular, are very realistic aspirations for many learners. The theory of expansive learning provides a valuable framework for analysing and improving learning in VET (Young 2001). As a matter of fact, learning is not just about the knowledge and skills that students or trainees acquire. It also proposes that learning involves: schools learning about changing workplaces, companies learning about the learning needs of new models of production, and school employer partnerships learning about new kinds of relationships they can develop. In addition, the theory of expansive learning is not limited to specifying new outcomes for learning such as core competencies; rather, it sees learning as a cyclical never ending process. By so doing, it provides a basis for linking initial VET to a policy of lifelong learning.

We have claimed that entrepreneurship is a process that can be put into practice in VET through the Change Laboratory so as to enhance in students and teachers an entrepreneurial mindset, and to improve curricula in line with European Union recommendations, thus contributing to the achievement of the ambitious goals of the European Agenda for 2020.

Bibliography

- Ahonen, H., Engeström, Y., & Virkkunen, J. (2000). Knowledge management-the second generation: Creating competencies within and between work communities in the Competence Laboratory. In Y. Malhotra (Ed.). *Knowledge management and virtual organizations*. Hershey: Idea Group.
- Akkerman, S. F., & Bakker, A. (2011). Boundary Crossing and Boundary Objects *Review of Educational Research*, 81(132-169).
- Cedefop (2011). *Guidance supporting Europe's aspiring entrepreneurs. Policy and practice to harness future potential*. Luxemburg: Publications Office.
- Cole, M. (1996). A multilevel methodology for cultural psychology *Cultural psychology: A once and future discipline B2 - Cultural psychology: A once and future discipline* (pp. 286-325). Cambridge, MA: Belknap Press.
- Durkheim, E. (1901). *Moral Education; a study in the history and application of the sociology of education*. Republished 1961. New York: Free Press of Glencoe.
- Edwards, A. (2006). Relational agency: Learning to be a resourceful practitioner. *International Journal of Educational Research*, 43, 168-182.
- Engeström, Y. (2011). From design experiments to formative interventions. *Theory & Psychology*, 21(5), 598-628.
- Engeström, Y., Engeström, R., & Karkkainen, M. (1995). Polycontextuality and Boundary Crossing in Expert Cognition: Learning and Problem Solving in Complex Work Activities. *Learning and Instruction*, 5(4), 319-336.
- Engeström, Y., & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational Research Review*, 5, 1-24.
- Engeström, Y., & Sannino, A. (2012). Concept Formation in the Wild. [Article]. *Mind, Culture & Activity*, 19(3), 201-206.
- Engeström, Y., Virkkunen, J., Helle, M., Pihlaja, J., & Poikela, R. (1996). Change laboratory as a tool for transforming work. *Lifelong Learning in Europe*, 1(2), 10-17.
- European Commission (1993). *Growth, Competitiveness, Employment: The Challenges and Ways Forward into the 21st Century*. White Paper. <http://europa.eu/documentation/official-docs/white-papers/pdf/growth_wp_com_93_700_parts_a_b.pdf>.
- European Commission (2006). *The Key Competences for Lifelong Learning – A European Framework*. <http://ec.europa.eu/education/lifelong-learning-policy/key_en.htm>.

- European Commission (2009). *Entrepreneurship in Vocational Education and Training*. <http://ec.europa.eu/enterprise/policies/sme/files/smes/vocational/entr_voca_en.pdf>.
- European Commission (2010). *Creative Learning and Innovative Teaching*. <<http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=3900>>.
- European Commission (2012). *Towards Greater Cooperation and Coherence in Entrepreneurship Education*. <<http://ec.europa.eu/enterprise/policies/sme/promoting-entrepreneurship/education-training-entrepreneurship/reflection-panels/>>.
- Fini, R. (2007). Education and social selection in Italy. In (Eds.) R. Teese, S. Lamb, and M. Duru-Bellat, . *International studies in educational inequality, theory and policy*, Vol. 2, 89-110. Dordrecht: Springer.
- Gibb, A. (2002). In pursuit of a new 'enterprise' and 'entrepreneurship' paradigm for learning: creative destruction, new values, new ways of doing things and new combinations of knowledge. *International Journal of Management Reviews*, 4(3), 233-269.
- Goodson, I. (1983). *School subjects & curriculum change: case studies in curriculum history*. London: Croom Helm.
- Guile, D. (2006). Learning Across Contexts. *Educational Philosophy and Theory*, 38(3), 251-268.
- Heinonen, J., & Poikkijoki, S.A. (2006). An entrepreneurial-directed approach to entrepreneurship education: mission impossible? *Journal of Management Development*, 25(1), 80-94.
- Polesel, J., Helme, S., Davies, M., Teese, R., Nicholas, T. & Vickers, M. (2004). *VET in Schools – a postcompulsory education perspective*. Leabrook: NCVER.
- Polesel, J. (2008). Democratising the Curriculum or Training the Children of the Poor: school-based VET. *Australia. Journal of Education Policy*. 23(6) 615–31.
- Polesel, J. (2010). VET and Young People: the Pathway of the Poor? *Education + Training*, 52(5).
- Sannino, A. (2009). Teachers' talk of experiencing: Conflict, resistance, agency. *Teaching and Teacher Education*, 26, 838-844.
- Sannino, A. (2011). Activity theory as an activist and interventionist theory. *Theory & Psychology*, 21(5), 571-597.
- Starr, K. (2007). Principal 'Disengagement': Are the Solutions Addressing the Problem? In Donahoo, S. & Hunter, R. C. (Eds) *Teaching Leaders to Lead Teachers: Educational Administration in the Era of Constant Change*, 335 – 353. Oxford, UK: Elsevier Science.
- Tynjälä, P. (2007). Review: Perspectives into learning at the workplace. *Educational Research Review*, 3, 130-154. doi: 10.1016/j.edurev.2007.12.001
- Tynjälä, P., & Gibels, D. (2012). Transitions and transformations in learning and education [electronic resource] / Päivi Tynjälä, Marja-Leena Stenström, Marjatta Saarnivaara, editors: Dordrecht-New York: Springer, c2012.
- Volkman, C., Wilson, K. E., Mariotti, S., Rabuzzi, D., Vyakarnam, S., & Sepulveda, A. (2009). *Educating the Next Wave of Entrepreneurs. Unlocking entrepreneurial capabilities to meet the global challenges of the 21st Century*. Geneva: World Economic Forum.
- Winch, C. & Clarke, L. (2003). Front-loaded vocational education versus lifelong learning: a critique of current UK government policy. *Oxford Review of Education*, 29(2), 239-252.
- Young, M. (2001). Contextualizing a New Approach to Learning: some comments on Yrjo Engström's theory of expansive learning. *Journal of Education and Work*, 14(1), 157-161.