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A comparative study in Italy and Australia using the Change Laboratory

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Index of abbreviations

CHAT Cultural Historical Activity Theory (*Teoria Storico Culturale dell'Attività)*

EPE entrepreneurship education

GDP gross domestic product

ITS Superior Technical Institute *(Istituto Tecnico Superiore)*

PMI piccole e medie imprese

RTO registered training organization

SES socio economic status

SME small and medium enterprises

SWOT strengths, weaknesses, opportunities, and threats

TAFE technical and further education

TTC trade training centre

TVET technical and vocational education and training

VCAL Victorian Certificate of Applied Learning

VCE Victorian Certificate of Education

VET vocational education and training

ZPD Zone of Proximal Development

ZSP Zona di Sviluppo Prossimo

Declaration

This is to certify that:

- the thesis comprises only my original work towards the PhD except where indicated in the Preface,
- due acknowledgement has been made in the text to all other material used,
- the thesis is fewer than 100.000 words in length, exclusive of tables, maps, bibliographies and appendices.

Preface

Prefazione

Homo *faber fortunae suae.*

Appius Claudius Caecus

The words attributed to Appius Claudius Caecus enjoy a widespread and unique popularity, and are often given as an example of how humankind is the manufacturer of its destiny. Nowadays, modern education systems are confronting the issue of how to teach students to turn ideas into actions. This requires autonomy, creativity, initiative and the capacity to seize opportunities. This is called entrepreneurship education, and is the type of education necessary for a citizen living in the era of globalization to be the manufacturer of his or her own destiny. Homo faber is also useful as it evokes the image of the craftsperson (faber literally means blacksmith). In this regard, the modern institution preparing craftspersons for working life is vocational education and training. Hence, homo faber characterizes the very subject of this research: entrepreneurship teaching in vocational education.

This comparative project has been written for an international reader interested in modern vocational systems, such as the Australian and the Italian systems. Entrepreneurship education and vocational

Questa enunciazione attribuita a Appio Claudio Cieco gode di un particolare e generale favore, e viene spesso citata come esempio di come l'uomo sia l'artefice del proprio destino. I moderni sistemi educativi si interrogano su come si possa insegnare allo studente la capacità di trasformare le idee in azione: questo richiede autonomia, creatività, iniziativa come pure l'abilità di cogliere le opportunità. Questa è chiamata educazione all'imprenditorialità, ed è un tipo di educazione necessaria perché il cittadino della società globalizzata possa essere l'artefice del proprio destino. 'Homo faber' inoltre evoca l'immagine dell'artigiano; a tal riguardo, la moderna istituzione che prepara l'artigiano per la vita lavorativa è la formazione tecnica e professionale. 'Homo faber' dunque caratterizza il tema di questa ricerca: l'insegnamento dell'imprenditorialità nell'educazione tecnica e professionale.

Questo progetto comparativo è stato scritto pensando ad un lettore internazionale interessato a moderni sistemi di formazione tecnica e professionale quali quelli australiano ed italiano. L'educazione all'imprenditorialità e l'educazione tecnica e professionale sono

education are considered key elements in combating youth unemployment and helping students face and thrive on the challenges of globalization. Other challenges they will be faced with include climate change and the consequent need for green technologies and economies. At the same time, when turning these challenges into opportunities, youth will have to create value and empower their communities. It is for this reason that improving vocational students' capabilities was another aim of this research.

Here it is argued that the 7th European key competence on the sense of initiative and entrepreneurship can be examined through a sociocultural laboratory of social change called the Change Laboratory. VET students are seen as boundary crossers, as in their vocational courses they often cross the boundaries between school and work. The boundary is characterized by tensions (and thus problems) due to different sociocultural environments encountering diverse objectives, rules, division of labour, community, tools and outcomes. These tensions can be also considered a resource, and thus a learning opportunity for students to show a sense of initiative and entrepreneurship. In this study, the challenges students are facing are discussed within the Change Laboratory workshops, together with teachers and work tutors (representatives of the two interacting activity systems), in a joint effort to redesign the activity systems (school and work) and their relationship.

Results from the two very different vocational contexts in Australia and Italy

considerati elementi chiave per contrastare la disoccupazione giovanile ed aiutare gli studenti a fronteggiare e a prosperare le sfide poste dalla globalizzazione. Altre sfide che i cittadini del futuro dovranno affrontare sono i cambiamenti climatici con il bisogno conseguente di tecnologie ed economie verdi. Mentre trasformano queste sfide in opportunità, gli studenti dovranno creare valore ed empowerment per le loro comunità. Questa è la ragione per cui un altro fine della ricerca è incrementare le capacitazioni degli studenti.

La tesi che qui si sostiene è che la settima competenza chiave Europea sul senso d'iniziativa e d'imprenditorialità possa essere studiata attraverso un laboratorio socioculturale di cambiamento sociale chiamato Change Laboratory. Gli studenti frequentanti istituti tecnici e professionali sono visti come attraversatori di confini, siccome durante i loro studi attraversano i confini tra scuola e lavoro; i confini sono caratterizzati da tensioni (cioè problemi) dovuti ai diversi ambienti socioculturali che vanno incontro ad obiettivi, regole, divisione del lavoro, comunità, strumenti e prodotti dell'attività diversi. Queste tensioni possono essere considerate risorse e dunque opportunità di apprendimento perché gli studenti possano mostrare senso di iniziativa e di imprenditorialità. Per far questo, i problemi sono discussi all'interno dei Change Laboratory da studenti ma anche insegnanti e tutor aziendali, cioè dai rappresentanti dei due sistemi di attività interagenti, in uno sforzo congiunto di riprogettazione dei sistemi di attività scuola e/o lavoro come pure delle loro relazioni.

permitted a comparison to better understand the elements that encourage a sense of initiative and entrepreneurship in vocational education.

This thesis is divided into 9 chapters.

The first chapter will present the problem. According to many scholars, since the 1970s the prominent role of knowledge as driver of innovation and change has determined a dramatic switch from managed society to entrepreneurial society characterized by extremely dynamic SMEs (small and medium enterprises). In this context, citizens must be equipped with a sense of initiative and entrepreneurship (which is essentially about 'turning ideas into action') in order to master globalization and change in a lifelong learning perspective. Entrepreneurship teaching is essential to improving the quality of vocational education and thus combating youth unemployment, a phenomenon widespread in Europe and elsewhere.

The second chapter will present a review of the literature to frame the research project. The main research streams are: the concept of competence and its developments; sociocultural studies on expertise seen as boundary crossing; a critical analysis of the introduction of the competence concept in education; sense of initiative and entrepreneurship as a European key competence for lifelong learning; entrepreneurship teaching in vocational education; and the Change Laboratory within Cultural Historical Activity Theory (CHAT) to

I risultati provenienti da due contesti così diversi quali Australia ed Italia permettono un confronto per comprendere quali sono gli elementi che incoraggiano il senso di iniziativa e di imprenditorialità negli studenti coinvolti in percorsi di scuola e lavoro.

Il presente elaborato è diviso in 9 capitoli.

Il primo capitolo presenta il problema. Secondo molti autori, a partire dagli anni Settanta il ruolo prominente della conoscenza come elemento promotore d'innovazione e cambiamento ha determinato un mutamento delle nostre società, che da 'pilotate' sono diventate 'imprenditoriali'. Quest' ultime sono caratterizzate dalle PMI (piccole e medie industrie). In questo mutato contesto, i cittadini devono essere provvisti di senso d'iniziativa e d'imprenditorialità (che consiste essenzialmente nella capacità di trasformare le idee in azione) onde padroneggiare il cambiamento e la globalizzazione in una prospettiva di apprendimento permanente. L'insegnamento all'imprenditorialità è essenziale per migliorare la qualità della formazione tecnica e professionale e contrastare la disoccupazione giovanile, un fenomeno diffuso in Europa ed altrove.

Il secondo capitolo presenta una rassegna della letteratura per inquadrare il presente progetto. I principali filoni di ricerca presi in considerazione sono: il concetto di competenza ed i suoi sviluppi; gli studi socioculturali sulla competenza vista come attraversamento dei confini; l'analisi critica dell'introduzione dell'approccio per competenze nella scuola; il senso d'iniziativa e d'imprenditorialità come

bring about expansive learning and social change.

The third chapter will outline the methodological framework, and will consider the practical details of the research. It is concerned with the timeline for the research in Italy and Australia including: the request for authorizations; the observant participation; the Change Laboratory workshops; and the follow up. Concerning the follow up, the same chapter will present the questionnaire used to gather data on the educational and socio-economic outcomes of the research. The questionnaire is divided into two parts. The first part is made up of multiple choice questions on the European 7th key competence on the sense of initiative and entrepreneurship. Following this, to better investigate the meaning attributed by the participants to the experience, the second part of the questionnaire comprises open questions on the 7th European key competence and the Change Laboratory.

The following chapters focus on the results. The reader - either Italian, Australian or international, can read them separately if interested in only one setting or in the comparative study.

Chapters 4 to 7 are organized according to the specific setting. In the 4th and 5th chapters the Italian results are illustrated, while chapters 6 and 7 display the outcomes for the Australian part of the project. The chapters on the two settings follow a similar structure. Chapters 4 and 6 describe the outcomes of each of the Change Laboratory workshops. This

competenza chiave europea per l'apprendimento permanente; l'insegnamento dell'imprenditorialità nella formazione tecnica e professionale; il Change Laboratory nell'ambito della Teoria Storico Culturale dell'Attività (CHAT) per promuovere l'apprendimento espansivo ed il cambiamento sociale.

Il terzo capitolo illustra la cornice metodologica ed i dettagli pratici della ricerca. Si riporta la scansione temporale della ricerca in Italia ed Australia incluse le necessarie autorizzazioni, l'osservazione partecipante, i Change Laboratory e la raccolta dei dati. Lo stesso capitolo presenta i questionari utilizzati per raccogliere i dati relativi ai risultati educativi e socioeconomici della ricerca. Il questionario è diviso in due parti. Il primo è costituito da domande a scelta multipla sulla settima competenza chiave europea sul senso d'iniziativa e d'imprenditorialità. A seguire domande aperte indagano i significati attribuiti dai partecipanti alla settima competenza chiave ed ai Change Laboratory.

I capitoli seguenti mostrano i risultati nei due contesti. Il lettore – italiano, australiano ovvero internazionale li potrà leggere separatamente se interessato solo ad un setting.

Mentre i capitoli 4 e 5 mostrano i risultati della parte italiana, i capitoli 6 e 7 illustrano i risultati australiani. Questi seguono un ordine similare: i capitoli 4 e 6 descrivono i risultati di ciascun laboratorio; quest'analisi è preceduta da un'analisi storica, soprattutto di come l'educazione all'imprenditorialità era impartita nella scuola. In linea con CHAT, un'analisi storica

is preceded by an historical analysis of the context as well as the way entrepreneurship education was delivered in the two settings. Consistent with the principles of CHAT, a historical analysis is necessary to better understand the meaning given by the participants to the sense of initiative and entrepreneurship as well as the Change Laboratory workshops. For each setting, chapters 5 and 7 describe the outcomes of the research. The chapters start with a detailed analysis of the multiple choice questions on the 7th European key competence. Following this, the answers to the open questions on the sense of initiative and entrepreneurship as well as the workshops are described according to a classification made by the researcher and common to both contexts. The artefacts made by the students are then described and commented upon as shared mental concepts according to the theory of expansive learning. The conclusions are then drawn according to the peculiarities of each setting.

Chapters 8 and 9 deal with the comparative study and the conclusions. Chapter 8 starts by comparing the quantitative and qualitative answers in the two contexts and then comments on the results. Chapter 9 summarizes the entire study, starting with the issue confronted, youth unemployment and the role of entrepreneurship education and vocational education in a globalized society. Chapter 9 describes the comparative study and presents the main findings. The chapter then identifies connections between the cultural approaches to entrepreneurship, the Change

si rivela infatti necessaria per comprendere meglio i significati attribuiti dai partecipanti al senso d'iniziativa e d'imprenditorialità come pure ai Change Laboratory. I capitoli 5 e 7 descrivono i risultati della ricerca; si inizia con un'analisi dettagliata delle domande a risposta multipla sulla settima competenza chiave europea; seguono le risposte alle domande aperte sul senso d'iniziativa e d'imprenditorialità e sul Change Laboratory analizzate secondo una classificazione messa a punto dal ricercatore e comune ad entrambi i contesti. Gli artefatti disegnati dagli studenti sono descritti e commentati sotto forma di concetti mentali condivisi secondo la teoria dell'apprendimento espansivo. Seguono le conclusioni, che sono effettuate sulla base delle peculiarità emerse in ciascuna ambientazione.

I capitoli 8 e 9 mostrano lo studio comparativo e le considerazioni conclusive. Il capitolo 8 inizia col confronto delle risposte quantitative e qualitative ottenute nei due contesti per poi commentarne i risultati. Il capitolo 9 riassume dapprima l'intero studio iniziando dal problema, cioè la disoccupazione giovanile e il ruolo dell'educazione all'imprenditorialità e dell'educazione tecnica e professionale in una società globalizzata. Il capitolo individua i possibili collegamenti fra gli approcci culturali all'imprenditorialità, il Change Laboratory e l'approccio delle capacitazioni. A seguire si cerca di guardare all'incrocio della Zona di Sviluppo Prossimo del senso d'iniziativa e d'imprenditorialità e della formazione tecnica e professionale. Si lanciano due proposte per la ricerca futura.

Laboratory and the capabilities approach. Next the chapter identifies the common Zone of Proximal Development of vocational education and the sense of initiative and entrepreneurship. Two proposals for future research are put forward.

The Italian reader still not too confident in English will also enjoy and have a taste of this dissertation. The preface, the conclusions and the introductory part of each chapter are translated into Italian.

Il lettore italiano ancora non troppo a proprio agio con la lingua inglese potrà ugualmente avere un assaggio e trarre beneficio da questo lavoro. La prefazione, le introduzioni di tutti i capitoli ed il capitolo conclusivo sono tradotti in italiano.

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This project was made possible by two factors. The first was an agreement signed in 2007 between the University Ca' Foscari and The University of Melbourne. The agreement is for a student exchange program: a student can complete their PhD at both the institutions and be granted a jointly awarded certificate. In addition to this a second element was necessary: this factor was a connection between the two doctoral schools. This was made possible by Umberto Margiotta, at that time PhD coordinator of the doctorate in Cognitive and Education Sciences at the University of Venice. Professor Margiotta was able to make a connection with John Polesel, senior researcher at the Faculty of Education at the University of Melbourne, Education Policy and Leadership Unit. Professor Polesel also encouraged the researcher to undertake this project.

This work has been supervised by two people: Massimiliano Costa, research fellow at the Ca' Foscari University, and John Polesel, Professor at the Melbourne Graduate School for Education. Massimiliano and John's suggestions have been complementary. Massimiliano assisted this project and contributed very much to improve its contents with his useful advice. His knowledge of educational processes within the industry and of competence has been extraordinarily important to grounding this work on solid basis. John's suggestions have been essential as well. John has helped in planning the research and establishing the structure of this work. His knowledge of vocational education and comparative educational policies has been invaluable.

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the researcher would like to thank his best friend Stefano Pellini, *amicus in incertis certissimus,* for his abiding support. Between his masters degree and doctorate the researcher spent two years at the Feuerstein Institute in Jerusalem where he worked as clinical psychologist and had the privilege to have Professor Feuerstein as inspirational guide.

Special thanks also to my Australian best friends Renato and Sami for their endless support. I would also like to thank the teachers who participated in the meetings and in their organization: Marj, Jossie, Amanda, Martino, Daniele, Lorenza, the work tutors and students that, in Australia and in Italy, were eager to participate in the workshops. Without their enthusiastic contribution this work would not have been possible.

1 Introduction

Entrepreneurship education increases the self-reliance of populations and makes them less dependent on an increasingly unpredictable job market.

In: Transforming TVET-from idea to action (UNESCO-UNEVOC, 2012, p. 98)

This chapter will frame the context for the research. It will start by describing the changes taking place in our societies due to globalization. A switch from managed society to entrepreneurial society has been observed, starting in the 1970s. In this transformed context SMEs have a prominent role in boosting innovation and employment.

Nowadays, a problem that many countries are facing is youth unemployment. Figures are provided to show how this phenomenon is pervasive, especially in Europe, and the causes for this are explained. It is argued that youth unemployment can be tackled with targeted vocational education and training based on an employment logic. The chapter continues by showing the downsides of vocational education in Italy and Australia. It is claimed that entrepreneurship education can improve the quality of vocational education.

Next an outline of the history of entrepreneurship and the definition of the term is provided. Subsequently the chapter demonstrates how entrepreneurship is implemented in Europe in terms of education

Questo capitolo presenta un panorama della ricerca su cui basare questo studio, ed inizia con una descrizione dei cambiamenti avvenuti nelle nostre società, che da pilotate sono diventate imprenditoriali. Tali cambiamenti sono avvenuti a partire dagli anni settanta, e sono imputabili al fenomeno della globalizzazione; in questo mutato contesto le PMI rivestono un ruolo decisivo nel promuovere innovazione ed occupazione.

Un problema odierno che molti stati stanno fronteggiando è la disoccupazione giovanile. Il capitolo fornisce alcune statistiche e spiega le cause di questo fenomeno così pervasivo in Europa, che può essere affrontato attraverso una formazione professionale e tecnica indirizzata verso una logica occupazionale piuttosto che educativa. Si evidenziano i problemi della formazione professionale e tecnica in Italia ed in Australia, e come essa possa essere elevata attraverso l'educazione all'imprenditorialità.

Successivamente si effettua un excursus storico e si dà una definizione di imprenditorialità, mostrando l'implementazione

policies and the gaps that remain to be filled. The final part describes how vocational education and entrepreneurship education together can boost innovation and growth in SMEs. The Change Laboratory, a type of workshop for social change suitable for vocational students who cross the boundaries between school and work, is presented.

di tale forma di educazione a livello di politiche europee ed evidenziando le criticità ancora presenti. La formazione tecnica e professionale assieme all'educazione all'imprenditorialità possono promuovere innovazione e crescita nelle PMI; a tal fine, il Change Laboratory è un tipo di laboratorio per il cambiamento sociale ideale per studenti che attraversano i confini tra scuola e lavoro.

(Vedi riassunto in fondo al capitolo).

1.1 The impact of globalization on our lives

The world is currently living through one of the most extraordinary moments in human history. According to Volkmann et al. (2009) "the power equation continues shifting across countries and regions, while rapid changes unfold in the marketplace reshaping both the political landscape and the interactions between governments and businesses". It has been argued that our societies are becoming more and more open and plural (Cárdenas Gutiérrez & Bernal Guerrero, 2011): within societies, individuals have more opportunities to realize their dreams and their space of action and initiative is improving.

A new definition of human development has come to the fore: "against the dominant emphasis on economic growth as an indicator of a nation's quality of life, Sen has insisted on the importance of the capabilities, what people are actually able to do and to be" (Nussbaum, 2003, p. 33). Human development is seen as a match between the ideas of development and substantial freedom: a "process of expanding the real freedoms that people enjoy" (Sen, 2001, p. 9). In addition to economic assets, human development depends on social assets, such as welfare and education systems, and political ones, such as civil rights and political participation. The freedom to act is represented by the possibilities and opportunities to access diverse courses of action due to individual resources and values. The centrality of the subject with their freedom to act is thus emphasized: thanks to their agency based on their capacities, the individual becomes the trigger of social and economic development, this time inclusive, sustainable and smart (Costa, 2012).

In this context of expansion of individual freedom, the paradigm of the 'entrepreneurial society' is emerging: "the old paradigm of the twentieth century is being replaced with the new paradigm of the entrepreneurial society – a society which rewards creative adaptation, opportunity seeking and the drive to make innovative ideas happen" (Bahri & Haftendorn, 2006, p IX). The 'knowledge era' we are living in is characterized by the knowledge society and the knowledge economy, and the 'knowledge mindset' (Badawi, 2013) becomes important to help the individual "navigate today's uncertainties and tomorrow's unknown developments, not only in labour markets but in all aspects of life" (p. 277).

One of the most important changes across societies according to the OECD (2010c) has been the shift from a 'managed' economy to an 'entrepreneurial' economy. The former was a mass production society characterized by "stable employment in large firms and a central role of unions and employers in regulating the economy and society in partnership with government. The social contract included regulation of labour markets and a strong welfare state" (p. 31). This society was predominant in the post-World War II era thanks to the advantages of size and large scale production (Audretsch, 2003). The importance of SMEs (small and medium enterprises) has been growing since the 1970s in North America and in Europe. The emergence of small niches in the markets, the rapid obsolescence of goods, and computer driven production have made it possible for small companies to compete with the larger ones, taking away most of the competitive advantages big firms used to have. Together with this shift, other changes have occurred: "the growth of the knowledge economy, open innovation, increased global connections, non-technological innovation, the Silicon Valley business model, and social innovation and entrepreneurship – represent an important change in the environment in which innovation takes place" (OECD, 2010c, p. 31). Both in advanced and developing economies, the shift to a knowledge society has made knowledge the most important factor of production. In this shift, SMEs have become more competitive due to their ability to be flexible. All these changes have contributed to the emergence of a new economy where SMEs and entrepreneurship play a crucial role as drivers of innovation growth and creation of jobs (OECD, 2010c).

At the same time, societies are facing global changes extending well beyond the economy, and global competitiveness is making demands on governance, organisation and lifestyle structures.

> In recent years, the economic fortunes of different countries around the world have become less predictable as national economies become more closely woven together. Companies look for locations with the cheapest operating costs, while capital moves quickly across national borders seeking the highest return. Many population groups find themselves moving to follow employment opportunities or to secure a better quality of life. (Bahri & Haftendorn, 2006, p IX)

There is a need to prepare youth for a life of greater uncertainty and complexity, such as: frequent occupational changes in the job and type of contracts; improved mobility; capacity to cope with different cultures; increased probability of self-employment; as well as more responsibilities, both in family and in social life (Gibb, 2002). Moreover, in the western economies phenomena like delocalisation have reduced the number of jobs available in manufacture. At the same time, the level of skills necessary to work in industry is getting wider and deeper:

> The world's population is growing at a time when traditional, stable labour markets are shrinking. In developed and developing countries alike, rapid globalization and technological change have altered both how national economies are organized and what is produced. Countries differ widely in their restructuring practices, but redundancies, unemployment and lack of gainful employment opportunities have been some of the main social costs of recent economic changes around the world. (Bahri & Haftendorn, 2006, p. 1)

In this scenario, in many countries youth are often left behind.

1.2 The plague of youth unemployment

According to the ILO, the International Labour Organization, five years after the beginning of the global financial crisis, global growth has started decelerating again and unemployment has risen, leaving 197 million jobless people in 2012. Of those jobless people, some 39 million have been made redundant in 2012 (International Labour Office, 2013). Youth has particularly suffered the consequences of the crisis with 6.4 million dropping out from the job market in 2012 alone (International Labour Office, 2012a). At the moment, 74 million youth are without a job, and another half million are expected to lose their job by 2014 (International Labour Office, 2013). According to the same source, the international youth unemployment rate is currently 12.6 per cent, but will rise to 12.9 per cent by 2017. The figure for youths unemployed for at least 6 months has increased from 28.5 per cent in 2007 to 35 per cent in 2012 (International Labour Office, 2013).

Moving from global figures for unemployment to the OECD countries, the crisis has been particularly severe in some of the most developed countries. In OECD countries in May 2012, for example, 48 million people (equivalent to a rate of 7.9 per cent) were unemployed, 15 million more than 2007 (OECD, 2012b). The figures throughout 2013 are expected to be stable with an average unemployment rate across the OECD countries of 8 per cent. The table below summarizes the figures for joblessness for key OECD countries from 2004 to 2012, with the forecasts for 2014.

Table 1-1. General unemployment and young unemployment rates in some OECD countries.

Employment and labour markets: Key tables from OECD - ISSN 2075-2342 - © OECD 2012									
Unemployment rate% of labour force Youth unemployment rate % of youth labour force (15-24)									
	2004		2007		2010		2012		2014*
Australia	5.5	11.4	4.5	9.4	5.3	11.5	5.2	11.3	5.5
Italy	8.1	23.5	6.2	20.3	8.5	27.9	10.7	35.3	12.6
United States	5.6	11.8	4.7	10.5	9.8	18.4	8.1	17.3	6.7
OECD-Total	7.0	13.7	5.8	12.0	8.5	16.7	8.0	16.2	7.8
EU-27**	9.3	19.0	7.2	15.7	9.7	21.1	10.5	22.8	12.0
* the forecasts for 2014 concern the overall unemployment rate (OECD, 2013) ** data from Eurostat									
doi: 10.1787/unemp-table-2012-1-en									

Source: OECD Employment and Labour Market Statistics

The table displays the figures for unemployment for three key countries (Australia, Italy and the United States), the EU-27 and the OECD average before and during the global crisis, as well as the forecasts for 2014. For each year taken into consideration, the left column indicates the figure of the overall unemployment, while the right column represents the youth unemployment rate. In 2012, while in Australia the unemployment rate was one third below than the OECD average, in Italy it was almost three points above the OECD average, and youth unemployment was twice as high. Since 2004, the average OECD country's ratio of overall unemployment against young unemployment has been 1:2. This is the case for Australia. By way of contrast, in Italy this ratio peaks at more than 1:3. The overall 2014 forecast for OECD countries predicts that unemployment figures will fall slightly over the next 18 months. However they are predicted to increase by 0.3 per cent in Australia and by 1.9 per cent in Italy (OECD, 2013).

In these countries, which are the focus of this research, the OECD (2012b) suggests that the employment outlook is expected to be quite different. In Italy, which has been hit hard by the crisis, unemployment has been concentrated among youth and low skilled

workers. A comprehensive reform has been implemented in 2012 with the aim to combat the segmentation of the labour market, and this is likely to mitigate the social effects of the crisis. On the other hand, it can be said that Australia has weathered the impacts of the crisis better, its joblessness rate being one of the lowest of the OCED countries (OECD 2012b). However, underemployment is still a major problem especially for women. Furthermore, the labour share has been declining since the 1990s, and the corresponding bargaining power of workers has shrunk.

All in all, youth joblessness is a problem that is common to every nation. In the OECD countries youth joblessness is at least double the overall rate of unemployment. During the years preceding the global downturn its rate had decreased from 16 per cent in the mid-1990s to 14 per cent in the mid-2000s (Quintini, Martin, & Martin, 2007). In May 2012 youth unemployment rose to over 16 per cent. A consequence for this is the increasing rate of long term joblessness: in 2011, 35 per cent of the overall unemployed had spent at least one year seeking a job. This figure rockets to 44 per cent in the European Union (OECD, 2012b). Similarly, in the US long term unemployment rose from 10 per cent in 2007 to 30 per cent in 2012 (OECD, 2012b). In both the U.S. and Europe youth have suffered enormously from unemployment, and this has hampered their school-to-work transition. The Southern European countries have the largest percentage of youth at risk (Quintini, 2012). Governments are pushed to take vigorous action against the risk that poor transitions from school to work create in generating social and economic marginality (Quintini, 2011).

Not all young people have a satisfying transition from school to work. Those who do not can be divided into two groups. The first group is the 'left behind youth' (OECD, 2010b): they lack a certificate or diploma; they come from remote or rural areas and/or belong to disadvantaged minorities such as immigrants. As many of them are aged from 15 to 29, they may fall into the category of the so called 'NEET' (neither in employment, nor in education or training). The second group are the 'poorly-integrated new entrants'. Even if they have a kind of qualification, they end up finding temporary jobs, thus alternating between periods of employment and unemployment even during economic growth.

Overall, the crisis has shown how the problems in youth labour market are structurally linked to education and training (OECD, 2012a). Tom Karmel, director of the Australian National Centre for Vocational Education Research (NCVER), suggests that nowadays there

is “overwhelming agreement on the importance of education and training in the downturn, and this is driven by short-term considerations—the need to keep young people usefully engaged—and long-term considerations—the need to have skilled people in the future” (in Sweet, 2009). In developed economies young people can choose to undertake further education to postpone their entrance into the job market, thus hoping to get a better job when they finish their school path (International Labour Office, 2012b). However, further training and human capital development do not necessarily lead to better or more occupations. As the markets are undergoing rapid changes, the training systems are struggling to catch up, and often students do not have the skills required by industry (International Labour Office, 2012b). Dropout is another issue in many countries. In this regard, vocational programs suffer from higher dropout figures when compared to general education programs (OECD, 2010a).

Focus on youth unemployment in Europe

Although youth have been progressively shrinking in number and becoming more educated, they are experiencing difficult transitions into the job market in many European countries (Cedefop, 2013b). One out of five young unemployed Europeans has never worked, and 75 per cent of these are less than 35 years old. As stated by the European Commission (2012c), they need further consideration and help for at least three reasons. First, their situation is more challenging in comparison to adults, and it has been deteriorating over time. Youth face high unemployment rates and are increasingly affected by long-term unemployment as well as labour market segmentation. Secondly, there are negative long-term implications of unemployment at a young age, such as the increased probability of future unemployment, the reduced level of future earnings and the higher probability of working in an unstable job. Thirdly, such negative effects go well beyond work perspectives, encompassing health status, life expectancy, and participation in social and civil life. In the Baltic States and in the Mediterranean Countries for example, there is a danger of entering poverty and little probability of exiting from it.

Quintini and Manfredi (2009) discuss diverse types of transitions from education to the job market in several OECD countries. In countries like Germany with regulated labour markets and efficient apprenticeship roughly 80 per cent of the students find a job. In other countries with regulated labour markets but no work based training into formal education such transition proves to be much more complicated. This is the case in Italy and

Spain. Employers in these countries tend to hire young people without experience because of their lower labour expenses. This has led to a division of job markets: on one hand there are well paid permanent jobs, and on the other hand there are unstable jobs with poor perspectives and protections (OECD, 2010b).

One of the main causes for this is skills mismatch, an issue which can be seen throughout Europe, especially in the Mediterranean countries, with over-education affecting 30 per cent of the youth (Cedefop, 2012b). Recent analysis by the European Central Bank (in European Commission, 2012c) shows how skills mismatches are related to unemployment and are caused by structural imbalances between job demand and supply rather than a lack of geographical mobility. In other words, higher educated workers do not raise issues of over-qualification as long as industry is able to create a good number of jobs requiring highly educated and innovative workers. It is evident that countries with higher levels of vertical skills mismatches (over- or under qualification) have some common features (European Commission, 2012b). First, they have lower levels of public funding in education. This could compromise their capacity to answer to changing requirements of the labour market. Secondly, a large share of stakeholders think that the education and training system does not accomplish the needs of the industry. Thirdly, such countries have rigid job markets, and invest less in job market programmes. In recent decades the job market in Europe has been reshaped for three main reasons (Cedefop, 2012a). First, technological progress has brought an increased demand for highly skilled workers. Secondly, delocalization, that is the production of goods in developing countries, has caused many unskilled jobs to disappear in Europe. Thirdly, the rapid obsolescence of skills is magnified in an aging society. A further influencing factor is the need for new skills required by the advancing green economy. A possible strategy to combat skills mismatch is through higher education in general and specifically vocational education that provides skills in line with demands made by industry (Cedefop, 2012b).

Even if the economy recovers in 2013, unemployment is expected to be high (Cedefop, 2013). Much European policy aims to address this issue. The European Commission's youth opportunities initiative (within Europe 2020's flagship Youth on the Move) has requested the Member States to implement policies so that youth are made a job offer within four months after having finished school. This could be either an apprenticeship or an education opportunity. Europe 2020 – An Agenda for New Skills and Jobs, and the Bruges Communiqué both emphasise the need to invest in youth's skills so that they are relevant

for the industry. Moreover, both documents underline the role of vocational education and training (VET). In this respect, many Member States are searching for new policies combining vocational education and labour market services for both the unemployed and new labour market entrants (European Commission, 2011).

The principle underlying such policies is that unemployment can be tackled by improving ones' competencies, capabilities and individual motivations, as well as the (re)insertion into active life which is, most of the time, working life (Costa, 2012). Not only do these policies call for a different action from the state, but also from the citizen, who is seen as aware and participative. Drawing on Sen's capabilities approach, Costa suggests that the worker's competent action should be seen in terms of means – that is, agency and substantial freedom, rather than ends (such as productivity or level of incomes). The value of the action stems from the breadth of the possible choices. Moreover, more agency is necessitated by the individual in a learnfare perspective to define and negotiate their formative needs with the state (Costa, 2012).

1.3 Technical and vocational education and training can combat youth unemployment

In this situation, education in general and technical and vocational education and training (TVET[1]) in particular can play a primary role to effectively prepare young people to live in our fast changing societies. Through its TVET strategy (2012-2015) UNESCO acknowledges the value of vocational education to address problems like youth joblessness and socio economic inequalities. According to the Shanghai Consensus:

> crises such as the food, fuel and financial crises, as well as natural and technological disasters, are forcing us to re-examine how we conceive of progress and the dominant models of human development. In doing so, we must necessarily re-examine the relevance of currents models of, and approaches to, technical and vocational education in an increasingly complex, interdependent and unpredictable world. (UNESCO, 2012, p. 1)

[1] TVET and VET reflect two synonyms when referring to vocational education; while the first can be found in international documents, the second is commonly used in the Anglophone countries. Vocational education is defined as a type of education preparing the individual for paid employment. Vocational education should be considered as separate from training, which is "essentially concerned with the inculcation of routine activities so that they can be carried out with competence and confidence" (Winch, 2013, p. 90), and is a common part of life for every individual. Technical education deals with the preparation for using a set of techniques that are "derived from the application of scientific principles to practice" (p. 91).

Moreover, Cedefop (2013a, p. 6) suggests that TVET produces a vast array "of monetary and non-monetary benefits, including higher wages, better job prospects, better health and satisfaction with life and leisure for individuals; higher productivity and employee satisfaction for organisations; and higher economic growth and civic engagement for countries". All in all, "the wide range of benefits generated demonstrate VET's dual role, in contributing to economic excellence and social inclusion" (p. 6).

Despite its possible role, in many OECD countries VET has been run down at the expense of general education and the need to prepare students for university (OECD, 2010a). Furthermore, VET has been commonly considered as low status by both students and the general public. Vocational education has "been associated historically with those classes of society who have to work for a living and who do not partake of the kind of education fit for the gentry" (Winch, 2013, p. 93). As a matter of fact, Winch continues, many states schools have "traditionally had an academic ethos. Transition to employment is not a major preoccupation of their staff, nor indeed is it considered to be a major part of their mission" (p. 107).

However,

> increasingly, countries are recognising that good initial vocational education and training has a major contribution to make to economic competitiveness. […] OECD countries need to compete on the quality of goods and services they provide. That requires a well-skilled labour force, with a range of mid-level trade, technical and professional skills alongside those high-level skills associated with university education. More often than not, those skills are delivered through vocational programmes. (OECD, 2010a, p. 9)

It has been argued that countries such as Austria, Germany and Switzerland have done well in tackling youth unemployment as a result of the efficient school to work transitions they provide (Quintini, 2012; Quintini & Manfredi, 2009), and it is widely acknowledged that this is due to their VET and apprenticeship programs. In this respect, Iannelli and Raffe (2007) argue that there are two ideal types of transition systems based on the strengths of connections between VET and employment, and served respectively by an 'employment logic' and an 'education logic'. In systems with strong connections the employment logic prevails: vocational education has strong ties with the labour market and loose ones with the educational system. On the other hand, in countries where an education logic is dominant, vocational education has loose connections with the industry, is less differentiated from secondary education preparing for university, and allows the students

to access university. The Netherlands and the German speaking countries are examples of systems adopting an employment logic, whereas Scotland, and it is claimed also Italy and Australia, could be examples of countries where systems use an education logic. Iannelli and Raffe investigate which of the two types of transition systems has the best 'vocational effect', that determines the most successful transition to employment. They conclude that in countries characterized by an employment logic the vocational effect is strong.

Tikly (2013) suggests a reconceptualization of vocational education and development according to a human capability and social justice approach. TVET was born during the industrial revolution in America and Europe with an instrumental function, namely to provide industry with the necessary skilled workforce. The underlying theory of human capital takes GDP (gross domestic product) as the fundamental indicator for development. However, at UNESCO the dominant approach is one of sustainable development, which states that development should meet the needs of the present without hampering the coming generations' needs. Unfortunately, such a concept is rather vague, and consequently solutions could turn out to be top-down and prescriptive rather than context dependent and inclusive.

On the other hand, a commitment to social justice is the assumption underlying the capabilities approach of Sen and Nussembaum. The key idea of capability is "agency freedom": people can act to trigger changes they have reason to value. This concept of agency has consequences in the way TVET is conceived and evaluated. The most important function of TVET is to promote the development of autonomy and the ability to make choices instead of simply providing individuals with the learning resources. Moreover, implicit in the capabilities approach "is that the moral imperative needs to relate to the experiences and values of individuals and communities in different contexts, and can only be arrived at through processes of informed public dialogue at different levels" (Tikly, 2013, p.20). From this perspective Sen's capabilities can be viewed as the ethical basis of rights in education, and possibly entail the realization of a variety of opportunities, not just provision of basic entitlements.

Weaknesses of VET in Italy and Australia

In Italy secondary education is delivered by lyceums (grammar schools), technical institutes and professional institutes. The first *(liceo*) is intended to prepare student for tertiary studies, while the other two offer vocational education. While technical institutes

specialize in preparing technicians in a wide spectrum of specialized occupations (for instance industrial, commerce, surveying) the third type of school *(istituti professionali*) offer less advanced qualifications (Polesel, 2006).

Since 2010 vocational education has gone through massive reforms that are being progressively implemented. Such reforms aim at creating a close relationship between the world of work and trades. On the one hand, this will allow the local industry to have the skilled personnel they are looking for, which in turn will permit industry to thrive and create further employment and wealth. On the other hand, this skills match is intended to tackle youth joblessness. Concerning the technical institutes, for instance, there will be more workshops, autonomy and flexibility of the training on offer. Schools should also make use of work experience, so that students will alternate periods of study with periods of practice. Also the different stakeholders such as local industry, chambers of commerce and unions will be involved more in the decision-making processes of the technical and professional institutes (Gentili, 2012a).

Talking about vocational education, Gentili (2012b) was able to demonstrate a positive correlation between the growth of the Italian GDP and the number of enrolments in technical programs. This suggests that skilled technicians are the backbone of Italian competiveness and wealth. Hence, the reforms of vocational education are of utmost importance to permitting Italy to compete on the world market. Gentili suggests that the above mentioned reforms are a step in the right direction. However, the real challenge will be to put them into practice. Many scholars contend that since the 1980s the technical institutes have lost their contact with the enterprise world, thus becoming auto-referential (Aprea, 2012; Benadusi, 2011b; Bertagna, 2010; Gentili, 2011; Salatin, 2011). In 2011, for instance, there was a shortage of skilled technicians in **1**6 out of the hundred most requested professions (Mauriello & Pini, 2012). In the same year, the Excelsior report (cited inUgolini, 2012) suggests that Italian enterprises were short of 117,000 technicians. At the same time, the figure for the so called NEET, the youth not in training or looking for employment, was double the European average, peaking at 22.7 per cent in 2011 (Cnel & Istat, 2013). In summary, there is a shortage of skilled technicians on the one hand, and an untenable youth unemployment on the other hand (Fumagalli, 2012; Mengoni, 2012). A consistent body of research blames this mismatch as one of the main causes of the economic recession affecting Italy (Bertagna, 2010; Bianchi, 2012; Bulgarelli, Centra, &

Mereu, 2012; Roma, 2012). Indeed, *made in Italy* has been mostly the slogan of local technical know-how based on small companies and crafts (Benadusi, 2011).

At the basis of this mismatch there is an idealistic cultural prejudice stemming from Gentile's school reform in 1923, contrasting intellectual with manual work (Gentili, 2012a). Culture and work are considered as separated, the former being inferior (Bertagna, 2010). A dramatic reconfiguration of school programs is thus called for to combat this prejudice, not just to rationalize curricula and operate spending cuts, but to focus on the link between research, didactics, and the educational value of work (Costa, 2011). Bertagna (2011) suggests that a possible solution would be to make mandatory some form of manual work (in terms of work experience, workshops, apprenticeships) for every student, regardless of whether they are willing to engage in general education or VET, or if they go to university or look for a job after their high school certificate. This has to be done during high school as a positive attitude toward work can only be gained before the individual is 16 year old. In a similar vein, argues Winch (2013),

> Subjects like woodworking, metalworking and pottery provide opportunities for a more rounded development of the individual, while at the same time providing students with the skills, discipline and sensibility that will stand them in good stead in TVET and in the workplace. (p. 113)

In Australia vocational education is delivered by schools, RTOs (Registered Training Organisations), and TAFE (Technical and Further Education) institutes. In recent years, enrolments in VET in Schools have increased enormously, with more than 90 per cent of schools offering some form of vocational education (Clarke & Volkoff, 2012). VET in School students are more frequently found in government schools. Generally speaking, in Australia the labour market, as well as educational pathways, are fragmented (Wheelahan, Leahy, et al., 2012). Some fields of education have close connections with industry, for example in health, electrical trades and engineering. Consequently, they have stronger educational pathways. By way of contrast, other fields such as finance and agriculture have limited contact with the business world. In these cases educational pathways are fragmented. Hence, depending on the industry sector, in Australia educational logic coexists with employment logic. In any case, a common criticality for the whole of vocational education is that only an estimated 30 per cent of the VET graduates end up working within a related field of their VET studies (Wheelahan, Moodie, & Buchanan, 2012).

Despite vocational education becoming more popular, the quality of education offered is considered poor and characterized by a high presence of low SES (socio economic status) students, thus not contributing to democratization (Polesel, 2008). Recent reforms in Australian secondary schools have brought the spotlight on VET with the aim of raising retention to achieve year 12 qualifications, as well as delivering effective training to meet the skills needed by industry. However, the main users continue to be low achievers and socioeconomically disadvantaged students, and the pathways to post-school education and training or employment are still poor (Clarke & Polesel, 2013).

Moreover, as most of the qualifications completed by VET in School students are at basic Certificate II (54 per cent) or Certificate I (38 per cent) levels (Clarke & Volkoff, 2012), industry is not convinced that these qualifications make the students ready to work, the main deficiency of such programs being the lack of work experience (Clarke, 2012b). This is due to the weak relationships between school-based entry level vocational programs (especially Certificates I and II) and occupations. As a consequence, vocational education in school often fails to provide for smooth transitions into the work market and full time employment, with the students ending up in casual and low-skilled occupations (Clarke, 2012a). To the contrary, Certificate III or above qualifications (often provided by TAFEs rather than schools) offer better transitions into the world of work, especially for the regulated trades. This is because they provide a stronger component of work experience in industry. However, even if a work placement is provided to all vocational students, which often proves to be difficult, workplaces do not always teach appropriate practices to apprentices (Wheelahan, Leahy, et al., 2012). Their quality varies greatly, with some being very good and others very poor. A possible problem, for instance, is that employers do not always comprehend the nature of learning.

It has also been argued that Australian vocational training is too narrowly conceived in terms of skills (Wheelahan & Moodie, 2011). In such an atomistic approach, vocational programs consist of units of competence which are made up of micro skills needed for the specified job position. Skills are thought of as decontextualized from the cultural and social environment and thus competence is not seen as interactive. Vocational programs tend to focus on the skills necessitated by the present position and thus emphasize tradition. They do not concentrate on the whole human being, and do not encourage the development of the student's autonomy and ability to make choices or their creativity and innovation, both inside and outside the workplace.

The critiques of the competence based approach in VET in Australia and the competence approach in Italy will be discussed in more detail in the second chapter.

1.4 Why is entrepreneurship important?

This study now examines the role of entrepreneurship within vocational programs, in order to focus on the capacity of this aspect of VET to address the previously described social and economic problems facing young people.

Entrepreneurship should be a core component of vocational education and training. The Shanghai Consensus on TVET, for example, argues that "given the scale of youth unemployment and vulnerable employment, entrepreneurship education is a necessary component for a successful transition from school to work" (UNESCO, 2012, p.4).

Generally speaking, there is a general consensus that entrepreneurship is key to turning the challenges of globalization into opportunities: "most commentators would now agree that a spirit of entrepreneurship is one of the principal factors in whether communities can successfully overcome the difficulties that global changes have generated" (Bahri & Haftendorn, 2006, p. IX). A major scholar like Gibb argues that the entrepreneurial paradigm "can be seen as a central means for organisations and individuals to cope with uncertainty and complexity but also as the mechanism for them to create and thrive upon it" (Gibb & Hannon, 2005, p. 4). Similarly, for the World Economic Forum (Volkmann et. al, 2009) "innovation and entrepreneurship provide a way forward for solving the global challenges of the 21st century, building sustainable development, creating jobs, generating renewed economic growth and advancing human welfare" (p. 12). The OECD (2010c) also suggests that:

> The unparalleled challenges at global, national and territorial levels demand new strategies and tools to successfully address them. […] If economic globalisation offers opportunities to improve living conditions, it also implies substantial and continuous restructuring and change. […] Competition keeps increasing and as a consequence, all territories have to engage more strongly in innovation. (p. 186)

On the one hand, governments are withdrawing their participation in the social arena: "the reduced capacity of government to raise taxes in an era of mobile capital, resulted in a pulling back of the welfare state at the same time as greater turbulence and labour market flexibility increased the strain upon it" (OECD, 2010c, p. 31). A consequence of this

can be seen in the progressive transformation of the welfare states into 'workfare' or, more lately, 'learnfare' states (see Lodigiani, 2008; Margiotta, 2013). Active participation is the imperative of these new models: in the job market; in the definition of the career path; and in services planning and supply (Costa, 2012).

On the other hand, more and more governments are expecting their citizens to find innovative solutions for the progress and wellbeing of their communities. For instance, in the Global Entrepreneurship Monitor initiative (Martínez, Levie, Kelley, Sæmundsson, & Schøtt, 2010) it is acknowledged that governments have started to realize how important it is for the economic growth and social progress to motivate individuals, organizations and stakeholders to seize and develop opportunities. UNESCO and ILO also consider entrepreneurship "as the driving force for progress in the social, governmental, and cultural arenas and this throughout time" (Bahri & Haftendorn, 2006 p. 2). Similarly, Cedefop (2011) suggests that "getting people to face challenges and uncertainty in the world of work with entrepreneurial spirit will provide the European economy with independent and creative thinkers who can 'think outside of the box', respond to challenges and adapt to change" (p. 20). Finally, Volkmann et al. (2009) contend that "only by creating an environment where entrepreneurship can prosper and where entrepreneurs can try new ideas and empower others can we ensure that many of the world's issues will not go unaddressed".

According to Martinez et al. (2010), the quality and quantity of entrepreneurial spirit and innovation in a country are a kind of competitive advantage. Countries can be classified into three groups according to their levels of economic development and the consequent entrepreneurship policies and education needed. In countries with natural resources and mining or extractive type activities, government policies give the foundations (for instance in terms of laws or infrastructures) to let people concretize their entrepreneurial ideas. As the economy of a nation improves, the cost of labour increases and cheap labour ceases to be a source of competitiveness. As a consequence, need-driven entrepreneurship becomes less frequent and governmental policies start encouraging entrepreneurship directly. This is the case in most advanced nations, where it is no longer possible to rely on cheap labour and it is necessary to compete based on innovation. At this level, entrepreneurship education is needed for citizens to turn their ideas into action and contribute to economic prosperity.

However, it is important to bear in mind that while entrepreneurship can be a constituent of economic growth, it does not translate automatically into human development (Gries & Naudé, 2011). Seen from Sen's capabilities approach, income and wealth (as well as technology and economic growth) only partially account for human development, which is more concerned with expanding an individual's positive freedom. Indeed, the same adjective, 'positive', should be used when defining entrepreneurship, which is about identifying and exploiting positive opportunities, "since many individuals exhibit great initiative and ingenuity in exploiting opportunities for self-gain that are un-productive or even destructive" (Gries & Naudé, 2011, p. 217). Furthermore, "crime, corruption or rent-seeking may pay for the individual materially, but we do not consider such behaviour as enhancing the well-being of either the individual involved nor that of society" (p. 217).

According to Sen's approach, a capability is the ability of the individual to achieve a certain functioning. Functionings are defined as "valuable activities and states that make up people's well being" (Alkire, 2005, cited in Gries & Naudé, 2011, p. 217). In other words, "capabilities are what people are free to do and achieved functionings is what they do" (Anand et al., 2009, cited in Gries & Naudé, 2011, p. 217). Entrepreneurship can be seen as a potential functioning, and for this it could be valued not just for reasons connected to money gains, but also because it may provide "a sense of achievement, of identity and of being accepted; it may provide independence and it may provide a lifestyle" (Gries & Naudé, 2011, p. 217). Nevertheless, entrepreneurship is valued only when it is a potential functioning, in other words, when there are other possible choices. If an individual has to start their own firm because the labour market does not offer any job, the person has no agency, and no value would be attributed to entrepreneurship. According to Gries and Naudé (2011) entrepreneurship should not be seen just as monetary gain, but as the opportunity for individuals to create new firms thus pursuing the kind of lives they desire.

In line with Sen's capabilities approach, a new dimension of entrepreneurship that breaks away from the business world is emerging:

> The true meaning of entrepreneurship goes far beyond the act of starting and running a business. Entrepreneurs are essentially ideas people, who seize opportunities to generate value or well-being in society by providing for unmet needs with a new product or service, or by carrying out an existing activity in a novel or more efficient way. (Bahri & Haftendorn, 2006, p.5)

It is thus advisable to keep these programmes separate from those in economics, as "rarely have business courses assumed the students will be ideas generators, business creators and/or owners" (p. 21). In a similar vein, Gibb (2002, p. 251) urges us to "take entrepreneurship out of the locker room of economics, remove it from the meta theoretical models of Schumpeter et al. and place it in a wider inter-disciplinary context built upon a more pluralistic and diffused view of society". It is a phenomenon transcending economy that is taking three main directions: the social, the public or political, and the moral or the regulations space (Cárdenas Gutiérrez & Bernal Guerrero, 2011).

In the literature there are three different approaches to entrepreneurship (Kyro, 2006). The first approach is about venture creation, recognition of opportunities and innovation. Entrepreneurship is seen as creation of new businesses, and focuses on the person's conduct (rather than the person itself). A second approach is the so called individual oriented approach which focuses on how individuals learn to be entrepreneurial. The third approach to entrepreneurship is the cultural approach. This approach states that entrepreneurship can especially be located in two historical periods, when freedom, creation of new practices and transforming society became essential. The first period was at the beginning of industrialization, the second started in the 1970s. In line with Sens's capabilities approach, the essence of this third broad cultural approach is liberalism, development and democracy. Within this approach entrepreneurship education may be considered both from the individual or the collective point of view: most importantly, it shows how these two levels are interconnected (Kyro, 2005, p. 70). Similarly to the cultural approach to entrepreneurship, the capabilities approach also stresses the connection between individual and society: in its quintessence, individual freedom is a social product (Sen, 1999). The interconnection between individual and social agency is based on trust in logos, that is, in discursive practices, and the capacity of human beings to reflect on their actions (Costa, 2012). The spaces where individuals can discuss and make decisions are therefore of particular importance to improving their capabilities.

Bandura's self-efficacy theory has been used to measure human agency at the level of the individual. This theory posits that human agency has both internal and external determinants, and studies the internal psychological determinants: "perceived self-efficacy is a 'judgement of capability' in that it concerns "people's beliefs in their capabilities to exercise control over their own functioning and over events that affect their lives"

(Bandura, 2001 in Alkire, 2005, p. 238). Measures of agency are organized around the concept of self-efficacy, that is "people's belief in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over given events" (Ozer & Bandura, 1990 in Alkire 2005, p. 239). However, although agency is a personal dimension, it is characterized by social relationships of individuals, and self-efficacy theory does not adequately take into account the social aspect of agency.

New forms of entrepreneurship are emerging. Entrepreneurship for social inclusion, for instance, "seeks growth by allowing more people – especially marginalized ones such as the very poor, women in many contexts, minorities, disabled and disadvantaged – to engage actively in productive economic activities" (Volkmann et al. 2009, p. 9). It is useful for "self-employment, starting or growing micro or small enterprises and to social enterprise using business-based approaches driven by a social mission" (Rodríguez, 2009, p. 1). In fact, the same qualities necessary for entrepreneurship are also essential to succeed in the knowledge economy, both in the private and in the public sector. If it is true that not everyone needs to become an entrepreneur, it is also true that all individuals need to be more entrepreneurial within society. This is particularly important for young people, since they will have to be able to create their own employment opportunities:

> More than ever, there is a need to actively engage young people in finding creative solutions to improving the welfare of their communities, while contributing to collective prosperity in ways that do not damage natural resources. Intelligence should include the ability to envisage alternative futures, to resolve open-ended problems with more than one way of doing things. (Bahri & Haftendorn, 2006, p. 18)

An issue that has been raised in the literature is whether an individual is born entrepreneurial or can learn how to be entrepreneurial. Some people are of the opinion that individuals are born with an entrepreneurial attitude, for example Steve Jobs and Bill Gates, who both dropped out of school to start their business. Research also shows that children whose parents are entrepreneurs are more likely to be entrepreneurs (Volkman et al., 2009). Nevertheless, there are at least three reasons to promote entrepreneurship education (Kyro, 2005). First, it has been acknowledged that small firms rather than big ones create new jobs. Secondly, psychological research has failed to find traits of personality related to entrepreneurship (Martinez et al., 2010), that is, entrepreneurship is more about education than personal traits. Finally, culture plays a major role in the improvement of a number of firms and in entrepreneurial conduct.

Unfortunately, many authors argue that initiative and entrepreneurship have been neglected or even repressed in schools. Volkman et al. (2009), for example, claim that "the structures and delivery of mass education in most countries often thwart or throttle the natural entrepreneurial impulse in youth", and that "countries all over the world have begun to recognize the failure of their systems to educate young people to create, and not simply respond to, economic opportunities" (p. 25). Also for Cedefop (2011), the final goal of education so far has been to produce workers able to work in large companies in public administrations: as a consequence, education has been directed towards skills necessary to get a job rather than being geared to enhance self-employment and entrepreneurship.

However, recently it is increasingly argued that entrepreneurship could and should be taught in primary school, for example teaching pupils to be creative and flexible. Volkmann et al. (2009) suggest that there is entrepreneurial potential in every individual, as (p. 25) "risk-taking, opportunity recognition, competitive collaboration, and innovation define the species, and are a crucial aspect of self-expression". There is a need to rethink education according to an entrepreneurial paradigm, as, "the relevance of knowledge about facts is diminishing, while the need to learn how to access, analyse and exploit information and transform it into new knowledge is increasing" (Bahri & Haftendorn 2006, p. 18). Furthermore, Cedefop (2011) suggests that entrepreneurial pedagogy "is typically characterised by interactive and experiential methods, which require students to take an active role in the learning process, which is based on real-life situations and simulations" (p. 55).

Entrepreneurship is particularly important during secondary education, when students begin to "make decisions on how they should channel their talents, skills and energy, learning to assume the responsibilities of adulthood and preparing to enter the world of work" (Bahri & Haftendorn, 2006, p. 17). Bahri and Haftendorn contend that enterprise education could enhance the quality of secondary education for a variety of reasons. First, it is in line with many of the educational goals of governments. Secondly, it triggers aspects of the educational process like thinking and acting. Thirdly, it provides learning experience in conjunction with creativity. Fourthly, it recognizes diversity among individuals and promotes pedagogical progress across subjects and research of meaning, that is, how subjects relate to everyday life. It also fosters educational success and school-to-work transitions. This is because the local enterprise world is directly involved in the programs. Among the expected learning outcomes of entrepreneurship education there are:

"increased motivation, contribution to learning, development of creativity, self-confidence in different aspects of school life and in preparation for post-secondary pathways, the world of work and beyond" (Bahri & Haftendorn, 2006, p. vi).

There is also evidence that entrepreneurship education may assist students at risk of early leaving or with learning disabilities: "by unleashing the innate spirit, using interactive, experiential forms of teaching and learning, and connecting the classroom with the workplace, entrepreneurship education may be a factor in helping to keep students in school" (Volkmann et al., 2009, p. 25). In a similar vein, there is some evidence that "under-achieving students can excel in mini-company programmes, succeeding in practical assignments such as sales" (Cedefop, 2011, p. 14).

While research has produced an impressive number of studies on entrepreneurship, only a few of them are educational. This is because entrepreneurship has for long been considered an individual and business related topic rather than a collective and educational one (Kyro, 2005). Therefore, there is a need for educational models which communicate that entrepreneurship is a collective phenomenon.

The next section will focus on entrepreneurship in vocational education, where self employability after study completion is a suitable option.

1.5 Focus on entrepreneurship teaching in VET through the Change Laboratory workshops

VET students should be prepared for a spectrum of working life: as employees; working in cooperatives; in self-employment and starting ventures; and in family, social and voluntary work. Here it is argued that through entrepreneurship education, vocational graduates can widen their range of employment opportunities.

TVET (at all levels of education) and entrepreneurship education (EPE) have more in common with each other than either has with general education:

> First, TVET is already utilizing enterprises of all sizes to assist in training students and trainees. This real-life experience helps to expose them to the reality of entrepreneurship, and to see self-employment or starting up a business as a viable employment alternative. Second, some of the occupations for which TVET courses provide training lend themselves particularly to self-employment and the establishment of SMEs. Third, many TVET programmes and activities already include some of the main EPE skills, such as working in teams, problem-solving and thinking innovatively. […] For

> these reasons, and many others, EPE is crucial to TVET students, trainees, and equally important to their teachers and other educational personnel. (Badawi, 2013, p. 288)

Entrepreneurship is one of the core competencies "highly relevant to many occupations to which VET leads but have often neglected in traditional vocational programs" (OECD, 2010a, p. 67). In Europe, for example, there are many gaps to be filled regarding entrepreneurship teaching in VET (European Commission, 2009):

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

Hence, a key challenge is having teachers capable of teaching entrepreneurial behaviour, and providing guidance to students interested in starting a venture (Eurostat, 2012).

Some scholars have also argued that entrepreneurship in VET may be valuable in triggering growth in remote and suburban areas (Garlick, Taylor, & Plummer, 2007). The traditional approaches to growth in remote and suburban areas driven by the Australian Government failed as they did not take into account phenomena such as: global capitalism, the dynamism of the regional economies as well as the relationships among businesses. Enterprising human capital, on the other hand, is a major factor for regional expansion. In this respect VET may be placed in a key role in developing entrepreneurial competencies through its relationships with local businesses.

A key factor of entrepreneurship is innovation. There is no doubt that innovation plays a key role in SMEs to grant success and sustainability, and it does not have to come solely from the entrepreneur but also from the company's employees. Innovation goes beyond doing something new in a different way: it also means to add value to a business operation or be useful for the community where it is used (Dawe, 2004). By working side by side with SMEs, VET is in an ideal position to support their processes and development in three ways (Curtin & Stanwick, 2011). Vocational education can endow students with underpinning general skills, such as creativity and autonomy. Secondly, it can provide the up to date core

skills of the trade, thus preparing students to be agents of innovation. Finally, it can itself be part of the productive system. In so doing, it can contribute to engage industry in innovation processes. Moreover, TVET graduates are typically absorbed by high-tech SMEs (Badawi, 2013). There is also some evidence from research in Australia which suggests that more TVET graduates establish SMEs than do graduates of other types of education (Atkinson, 2011).

Toner (2011) describes two types of innovation. The first is radical innovation, and is the outcome of a major governmental investment; it results in a significant change in technology, economy or in the social environment. The second type is incremental innovation, and can be seen as the outcome of minor changes to a process or product which already existed. Toner suggests that the latter is the major source of growth of productivity. In this regard, VET in Australia has played a major role in adapting existing equipment to the Australian environment since the early settlers came to Australia (Pickersgill, in Curtin & Stanwick, 2011). Since then, people with technical backgrounds have been critical in the process of incremental innovation. Audretsch (2003) also agrees that R&D, which is mostly conducted in big companies, is not the most important source of innovation today. Innovation is mostly due to SMEs, whose strength stems from their ability to adapt ideas developed in other firms: this is sometimes known as knowledge spill over. In this context, "entrepreneurship takes on new importance in a knowledge economy because it serves as a key mechanism by which knowledge created in one organization becomes commercialized in a new enterprise" (p. 10).

However, the same concept of innovation should be questioned, as it should be seen as separate from scientific discovery, and instead viewed as a continuous learning process (Dawe, 2004). In his book on the cultural origins of human cognition Tomasello (1999) argues that cultural learning is a powerful mechanism in generating innovation based on social cooperation: a plurality of individuals create something together that no individual would be able to create on their own. In this respect, the third generation of activity theory within Cultural Historical Activity Theory (CHAT) presents itself as an ideal candidate to study innovation and entrepreneurial behaviours as an expansive learning process within and between organizations. CHAT is not only useful because it broadens the unit of analysis from the individual to the activity system to study entrepreneurship as collective phenomena, but also because some kind of triggering event is needed to inject entrepreneurial spirit in individuals. In other words, an intervention cannot be merely

descriptive, and an activist and interventionist theory and methodology is needed to study entrepreneurship.

Activity theory "stands as an activist theory of development of practices and can be traced back to Marx's idea of revolutionary practice, emphasizing that theory is not only meant to analyse and explain the world, but also to generate new practices and promote change" (Sannino, 2011a, p. 580). Within CHAT, the Change Laboratory workshop is a methodology which aims to transform social practices through the collective discussion of the problems the individuals are facing. The two core principles underpinning the Change Laboratory are Vygotskian double stimulation and ascension from the abstract to the concrete by Davidov (Sannino, 2011b). The dialectics triggered by the multiple points of view of the participants plus the materials gathered by the researcher during field research will provoke new ideas (in terms of shared theoretical concepts) which will be developed and put into practice. This process is expected to foster the participants' sense of initiative and entrepreneurship, as well as reflective learning processes. The agency is collective, as it is the entire group participating in the Change Laboratory that commits to changing the present state of things. By so doing, the ethical and social dimension of entrepreneurship is emphasized.

This study seeks to test the efficiency of a new methodology of entrepreneurial education – the Change Laboratory – in two large modern economies, Italy and Australia, focusing on their VET systems. As discussed above, it is likely that innovation comes from VET rather than other institutions. Given the importance of the relationship between VET and workplaces for the students' competencies, this project focuses on VET students undertaking work experience. In Australia, a VET in Schools Certificate III in Childcare was the focus of the study. The Certificate III was delivered over a year two days per week: one day students went to school for theoretical lessons on childcare, and the other day they went to the childcare centres as apprentices. In Italy, a technical high school diploma in building surveying was the focus. The course was delivered over five years. Two months' block work experience was made possible for a group of Grade V students.

As it has been made clear throughout this chapter, entrepreneurship is not simply about opening and running businesses. It is about creating a mindset that can help the students and future citizens to be entrepreneurial throughout their life in the different activities they will undertake: in the family, in the workplace, or in their social life. The

European key competence of the sense of initiative and entrepreneurship has been chosen to measure the knowledge, skills and attitudes related to entrepreneurship: initiating, creativity; capacity to work in teams and by project, to perceive their own weaknesses and strengths; and self confidence. All in all, this key competence is about putting ideas into action (European Commission, 2007), and it is enlarged to focus on the knowledge, skills and attitudes necessary from a lifelong learning perspective. In so doing, the spotlight is on the person and their capabilities rather than on the job position. Capabilities connect people, education and the workplace through the identification of the cultural, social and economic resources to enable the individual to develop, be creative and autonomous and thus able to exercise judgement (Wheelahan, Modie, Buchanan, 2012).

Seen within the CHAT framework, having students going from school to work turns them into 'boundary crossers'. Boundary crossing is a new dimension for the study of expertise where innovations are likely to be found: "experts face the challenge of negotiating and combining ingredients from different contexts to achieve hybrid solutions" (Engestrom, Engestrom, & Karkkainen, 1995, p. 316). In other words, by shifting and transforming concepts from school to work and vice versa, students could gain initiative and innovate, thus being entrepreneurial. The Change Laboratory, with representatives from the school and the workplace (teachers, work tutors) stimulates dialectics among the different actors (see Engestrom & Sannino, 2010). This is where the students' agency (and their sense of initiative) is triggered to look for new ideas on how to solve the problems they are having when moving from school to work setting or vice versa. Reflectiveness is one of the most important features to deal with contradictions and differences. The Change Laboratory is the place where the students' critical and transformative capacity is shaped. This represents the shift from competence to capability, that is, the capacity to realize.

The research project

The participants in the research were vocational students undertaking work experience, who attended Change Laboratory workshops. Once a week for two months they met with their work tutors and teachers to discuss the issues they were having in the transition from school to work. Materials called

I partecipanti al progetto sono stati studenti inseriti in percorsi di alternanza scuola lavoro che hanno partecipato ai Change Laboratory. Una volta la settimana per due mesi circa gli studenti si sono incontrati con i loro tutor aziendali ed insegnanti per discutere i problemi che avevano nella transizione fra

mirror were used to make these issues emerge during the meetings and bring about dialectics. Mirrors are gathered during field research, and may be interviews, videos of work activities, materials on the sense of initiative and entrepreneurship, documents representing the outcome of previous meetings. During field research hypotheses of the problems affecting the boundary crossing students were developed; and the materials related to unfolding these issues were projected over the workshops. The use of such materials and the points of view of the different actors were used to trigger discussion. Over the workshops, the participants (especially students) were required to find shared solutions and implement them. By so doing students were expected to enhance their collective agency and develop their sense of initiative and entrepreneurship.

In summary, the comparative project in two such diverse cultural contexts was intended to make it possible to draw conclusions on which elements are triggering entrepreneurial behavior and initiative in VET students in these contexts.

scuola e lavoro. La dialettica è stata aiutata dai cosiddetti materiali mirror: questi sono stati raccolti durante la ricerca sul campo; si trattava di interviste, video dell'attività lavorativa, materiali vari sul senso d'iniziativa e d'imprenditorialità, o documenti che rappresentavano gli esiti di altri incontri. Nella ricerca sul campo vengono infatti effettuate ipotesi sui possibili problemi degli studenti attraversatori di confini, e durante i workshop si mostrano al gruppo quei materiali che si pensa possano farli emergere. L'uso di questi materiali ed i punti di vista dei diversi partecipanti hanno scatenato una discussione costruttiva: durante gli incontri, i partecipanti (soprattutto studenti) hanno trovato soluzioni condivise e le hanno messe in pratica. Così facendo gli studenti hanno qualificano la loro agency collettiva sviluppando senso d'iniziativa e d'imprenditorialità.

Il progetto comparativo in due contesti culturali così diversi ha reso possibile trarre conclusioni su quali elementi promuovono comportamenti imprenditoriali in studenti inseriti in percorsi di formazione tecnica e professionale.

2 Literature review

The child seems to say: "I do not mind how much you know, I want to know things for myself. I want to have experience in the world and to perceive it with my own effort; you keep your own knowledge and let me acquire mine". We must understand clearly that when we give freedom and independence to the child, we give freedom to a worker who is impelled to act and who cannot live except by his work and his activity.

Maria Montessori, The Absorbent Mind (1949).

In the above quote Maria Montessori identifies that one of the main features of entrepreneurship education is teaching for autonomy and responsibility within a lifelong learning perspective.

Presently, learning takes place both in the school and in the workplace, and the concept of competence tries to integrate these different sources of learning. There are also learning processes taking place at the boundary between school and work experience which may boost competence in vocational students.

The sense of initiative and entrepreneurship is a European key competence for lifelong learning. This is useful to measure the educational outcomes of this comparative study between Australia and Italy, as it takes into account the whole student with their knowledge, skills and habits in a lifelong learning perspective. Employability skills are also relevant, as they are an entry level socio-economic outcome for entrepreneurship

Nella citazione sopra Maria Montessori identifica una delle caratteristiche principali dell'educazione all'imprenditorialità, cioè formare all'autonomia ed alla responsabilità in un'ottica di apprendimento permanente.

Ormai è assodato che si apprende sia a scuola che sul posto di lavoro, ed il concetto di competenza cerca di unire queste fonti diverse di apprendimento; ci sono inoltre processi di apprendimento che si sviluppano ai confini tra scuola e stage che potrebbero promuovere la competenza in studenti inseriti in percorsi di formazione tecnica o professionale.

Il senso di iniziativa e di imprenditorialità è una delle competenze chiave europee per l'apprendimento permanente, e può essere utilizzata per misurare i risultati educativi d'apprendimento di questo studio comparativo, dato che tiene conto dello studente nel suo insieme in una prospettiva di apprendimento permanente, con le sue conoscenze, abilità ed attitudini. Anche le abilità connesse all'occupabilità (employability skills) sono importanti ché possono essere considerate

teaching.

Heinonen and Poikkijoki's model of entrepreneurship teaching is cited in the European literature, and is based on Kolb's theory of experiential learning. Different theories of learning underpin different teaching models. This chapter will argue that Kolb's model is not adequate for entrepreneurship teaching, as it does not take into account learning as a collective process to bring about innovation and social change. A new theory of competence is needed to study learning at the boundary between school and work. A possible alternative is the theory of expansive learning within Cultural Historical Activity Theory (CHAT). Not only is expansive learning based on innovation, collectives and boundary crossing between activity systems such as school and work, it also offers a toolkit – the Change Laboratory - for organizational transformation and social change. Within the Change Laboratory workshops, theoretical concepts and their representations track the participants' sense of initiative and entrepreneurship.

To underpin this new model of entrepreneurship education based on expansive learning and the Change Laboratory this literature review will make use of the following research streams:

- the concept of competence and its developments;

- sociocultural studies on expertise seen as boundary crossing;

- critical analysis of the introduction of

come base per i risultati d'apprendimento socioeconomici dell'insegnamento all'imprenditorialità.

Il modello di Heinonen and Poikkijoki è citato nei documenti europei come modello per l'insegnamento all'imprenditorialità, ed è basato sulla teoria di Kolb sull'apprendimento esperienziale. A diverse teorie dell'apprendimento corrispondono diversi modelli di insegnamento; qui si sostiene che il modello di Kolb non è adeguato per l'insegnamento all'imprenditorialità perché non considera l'apprendimento come processo collettivo che porta innovazione e cambiamento sociale. Una nuova teoria della competenza è inoltre necessaria per studiare l'apprendimento ai confini tra scuola e lavoro. Una possibile alternativa al modello di apprendimento esperienziale è la teoria dell'apprendimento espansivo nella cornice della Teoria Storico Culturale dell'Attività. Non solo l'apprendimento espansivo è basato su innovazione, collettività ed attraversamento dei confini tra sistemi di attività interagenti quali scuola e lavoro; esso offre uno strumento - il Change Laboratory - per la trasformazione organizzativa ed il cambiamento sociale, all'interno del quale i concetti teorici e le loro materializzazioni caratterizzano il senso d'iniziativa e d'imprenditorialità.

Per sostenere questo nuovo modello d'educazione all'imprenditorialità basato sull'apprendimento espansivo ed il Change Laboratory questa rassegna della letteratura farà uso dei seguenti filoni di ricerca:

competence in education;

- the sense of initiative and entrepreneurship as a key competence for lifelong learning;

- entrepreneurship teaching;

- the Change Laboratory within CHAT to promote expansive learning and social change.

- il concetto di competenza ed i suoi sviluppi;

- studi socioculturali sulla competenza vista come attraversamento dei confini;

- analisi critica dell'introduzione dell'approccio per competenze nella scuola;

- il senso d'iniziativa e d'imprenditorialità come competenza chiave europea per l'apprendimento permanente;

- l'insegnamento dell'imprenditorialità;

- il Change Laboratory nell'ambito della Teoria Storico Culturale dell'Attività per promuovere l'apprendimento espansivo ed il cambiamento sociale.

2.1 The concept of competence

One of the most controversial issues facing educationalists is the multiform nature and polysemy of the concept of competence. (Margiotta, 2009). Competence embodies the link between learning and work, personal existence and professional life (Tessaro, 2012). Today it does not represent the exchange between the worker and their organizational context, but rather the meaning connecting the worker and their capabilities taken as freedom to do or to be (Sen, 2001). The capabilities approach qualifies the value of competence within a conversion process where the freedom to act becomes the freedom to realize one's own functionings (Costa, 2012).

During the last 20 years competence has become a keyword in the field of education, and taken over other terms such as skills and knowledge. This is because in our fast changing societies

> even highly developed knowledge and skills are no longer sufficient to meet the new challenges, situations and problems that are constantly facing people, companies, organizations and nations. There must be something more, a personal or common commitment, a readiness to act and change, an overview and insight, an obliging and cooperative attitude, a totality of qualities necessary to follow new developments and changing demands. (Illeris, 2009c, p. 1)

An active subject showing mastery and capacity to properly apply their skills when faced with new problems is a common element amongst the different conceptions of the term 'competence' (Ajello, 2011).

The next paragraphs aim to analyse and define the concept of competence. On the one hand, competence is a work in progress because its evolution is part of a bigger process which tries to give a name, shape and meaning to the deep transformations affecting society. On the other hand, the confusion, or rather polysemy, affecting this term is due to the different origins of the terminology used to define it: psychology, sociology, pedagogy, philosophy, sciences of language, economy and law (Gentili, 2011). Competence is also a word commonly used in everyday language. Baldacci (2010) contends that to free this term from the ambiguities typical of the common language, a conceptual clarification is necessary before using it in empirical pedagogy. An educational analysis of this term should be undertaken on three levels: the informal level of the common language, the intermediate level of the empirical pedagogy, and the formal level of the sciences of education.

The professional qualification can be considered as the antecedent of competence in adult education (Illeris, 2009a). This shift from professional qualification to competence has been caused by two factors (Gentili, 2011). On the one hand, there has been a crisis of the formative models centred on learning in structured contexts such as school, and the related school and academic certificates. On the other hand, in work environments, social and tacit knowledge has progressively gained more importance than the knowledge acquired at school. According to Costa (2011) there are a number of reasons why the concept of competence has recently gained such importance. First, labour has become loaded with knowledge while the aspect connected to manual execution is shrinking. Secondly, the non-material aspect of labour such as internal and external relations, communication, individual responsibility and the sharing of a company's values have gained more importance. Thirdly, people have increased their mobility, both within the company and in the labour market. Fourthly, learning based on application of instructions does not permit shaping of the worker's mindset in terms of problems solving, taking flexible and autonomous initiative, and mobilizing knowledge to deal with complex situations.

The different approaches to competence

Before undertaking further analysis of the concept of competence, it is useful to define terms such as knowledge and skills, which are sometimes used as synonyms for competence, and other times as its constituents. Knowledge indicates the abstract representation of facts, procedures, principles and theories in a certain domain (Cinquepalmi, 2011). It should not be confused with comprehension, as the capacity to reproduce information does not necessarily imply its comprehension, which is needed when knowledge is mobilized in a new challenging situation. On the other hand, skills associated with the mental processes are useful to manage knowledge, including problem solving, reasoning, processes of analysis, and synthesis (Cinquepalmi, 2011). Skills are internal mental processes and they should not be confused with the observable behaviours which are often used to measure them.

However, it is often difficult to infer a skill from its related behaviour. It is for this reason that Chomsky (1965) in linguistics used for the first time the word competence to describe the knowledge needed by a native speaker to produce and understand a potentially infinite number of correct sentences in a given language. An important difference between performance and competence is that while the latter is the sentence produced by the subject, the sum of the sentences does not account for the individual's mastery of their mother tongue language - their competence (Chomsky, 1986).

From the work of Rychen and Sagalnik (2001) and Sandberg (2000) three main approaches to competence can be distinguished: rationalistic, holistic and interpretative.

Rationalistic approaches

The rationalistic approaches to work organization precede and provide the basis for the first theorizations of competence. They can be traced to Taylor and his theory concerning the scientific organization of labour. David McClelland, an American psychologist and the founder of Hay-McBear, a society specializing in competence assessment, used this term for the first time in industry. In a famous article - Testing for competence rather than intelligence, McClelland (1973) argued that IQ tests and school qualifications fail to predict work performance. Consequently, for recruitment and career advancement it is more appropriate to use competence, which is not simply related to intelligence or habits, but to an organized set of behavioural and cognitive elements casually connected to work achievements. Two scholars of McClelland, Klemp and Boyatzis

(Boyatzis, 1982, 2008; Klemp Jr, 1980), define competence as a typical internal feature causally linked to an effective or superior performance in a given context that can be measured with a prearranged criterion. Spencer and Spencer (1993) went a step further in their model. For Spencer and Spencer competence is seen as an iceberg with five characteristics: motivations, traits, self-image, knowledge of specific topics and skills. These are divided into two groups: while the knowledge and skills are the tip of the iceberg, as they are relatively easy to be developed through training, the others are under the water. These are more deeply rooted in an individual's personality and require more effort to alter.

In the rationalistic approach competence is regarded as "constituted by a specific set of attributes that workers use to accomplish their work. Hence, those who perform their particular work more competently than others are regarded as possessing a superior set of attributes" (Sandberg, 2000, p. 11). In the rationalistic approach the individual and the world are separate entities, and reality exists regardless of the human mind. A job is objective and separated from the worker. These theories are also functionalistic, as the criteria of performance, the models for measuring, the competence indicators and the professional task profiles are at a premium.

Holistic approaches

The second approach to competence is the holistic one. Like the rationalistic approach, it considers competence as a set of personal attributes. Unlike the previous one, it concentrates on the global and complex nature of competence, which is not merely based on a job, but includes the typical life situations.

The model of competence advanced by Le Boterf (2011) is an illustrative example of such an approach. Competence is seen as an appropriate combination of resources. The contributing factors include: the necessary resources that can be either personal or come from the environment; the actual competencies, which are expressed in terms of activities or professional practices and correspond to schemas specific to the individual; and the performance indicating the results of the actions carried out. There is no cause and effect relationship between resources and competence since the same resource could serve for many competencies. The capacity to combine the resources is the person's capacity to build the competencies s/he needs: competences does not come from the resources one activates, but from the mobilization itself (Le Boterf, 2000). Le Boterf uses the verb 'to

orchestrate' to specify how, in order to become competent, resources are activated appropriately and are timely in a specified context. In addition Beckett (2009) emphasises the relational dimension of competence, which is holistic and not simply a list of skills and knowledge. One of its main features is the ability to make professional judgments and articulate the choice made among colleagues.

Another type of holistic approach is advanced by Rychen and Sagalnik (2001) and it is known as DeSeCo project. Since the 1980s the OECD has sponsored many projects seeking to define competence. Those converged into the DeSeCo project (OECD, 2005; Salganik & Rychen, 2003). The OECD's main focus was on how its Member States could equip their citizens with the capacities not only to cope with, but also shape globalization and continuous change. According to Illeris (2009) this raises almost a contradiction, as citizens should be taught how to face problems not known when the learning takes place. To address this issue the OECD looked for key competencies, and classified them into three broad categories: using tools interactively, interacting in heterogeneous groups and acting autonomously. The first group, using tools interactively, includes language, knowledge and information as well as technology. The second group is about interaction in heterogeneous groups. The competent citizen should learn how to relate well to others, and cooperate as well as manage and resolve conflicts. The third group, acting autonomously, is related to the competencies of: acting within the bigger picture; being able to make life and personal plans; and defending and asserting rights, interests, limits and needs. The three broad groups are combined differently according to the specific context. This model breaks away from competence seen as a combination of knowledge and skills. The subject's ability to reflect on his/her experience becomes crucial.

The OECD definition of key competences is based on the four pillars written by Delors (1998) in the famous UNESCO report named 'Learning: the treasure within'. These are: learning to know; learning to do; learning to live together; learning to live with others; and learning to be. The four pillars of education are classified according to three groups of competencies: basic, transversal, technical and professional. The DeSeCo project is a prototypic model of holistic competence, as it combines complex demands with psychosocial prerequisites in a complex system which makes it possible to perform an effective action. The model of Rychen and Sagalnik encompasses "lifelong learning and the learning society that strongly linked school and work, academic subjects and work

performance, and academic achievement of school subjects and the competencies of the workplace" (Han, 2009, p. 65).

Interpretative approaches

These approaches are underpinned by a phenomenological epistemology. The assumption is that the person and the world are indissolubly tied together by experience. Competence does not stem from the encounter of two separate entities, the worker and the job, but forms a sole entity through the meaning that work acquires in the worker's experience. For one's competence development, the capacity to self-learn and learn from experience become fundamental. The capacity to change one's point of view and to reframe a problem is considered more important than the mere accumulation of knowledge or skills.

Pellerey (2011), a representative of this approach, analyses the relational nature of competence according to three dimensions. The first relation is between the subject and the task: here a big role is played by the subject's interpretative capacity to give meaning to the specific situation. The second relation is between the subject and the social and collaborative context. The third relation connects the individual and the situation with the cultural and practical context evolving in time. A practice can only be understood against the sense and value it is given within the specific community context where it is put into action. The concept of competence operates a switch from 'being able to do' something linked to executions of procedures and pre-established schemas of action to 'being able to act'. It thus gives sense to and interprets the situation an individual must cope with, enabling an individual to design and complete actions responding effectively to a specific situation. In this there is also a dimension of 'being able to want' involving the subject's meanings, motivation and will (Pellerey & Orio, 2001).

The next section will analyse the sociocultural studies on expertise as prototypical examples of the interpretative approach.

2.2 Socio cultural studies on expertise

While learning traditionally belongs to formal education, it has been widely recognized that it also takes place in the workplace (Tynjala, 2008). In this respect, there is also a general agreement on the importance of the sociocultural context where the learning

takes place (Tinjala, 2008). Sfard (1998) uses two metaphors - acquisition and participation - to indicate how research understands the concept of learning. In the first metaphor concepts "are to be understood as basic units of knowledge that can be accumulated, gradually refined, and combined to form ever richer cognitive structures" (Sfard, 1998, p. 5). In the second metaphor, learning as participation is "conceived of as a process of becoming a member of a certain community" (p. 6). In the theory of legitimate peripheral participation by Lave and Wenger (1991), for example, the authors emphasise the knowledge embedded in communities of practice that one can learn through participation. Sfard contends that, while these two metaphors of learning are quite diverse, giving up one of the two is not possible, as they entail different kinds of learning as content or process. The first metaphor may be more appropriate to school learning, while the second appears to be more appropriate to workplace learning. The modern concept of competence attempts to bring together these different sources of learning which originate from a diverse range of environments.

Another synonym used for competence, indeed mostly popular in America, is expertise. Engestrom (1992, 2004b) and Engestrom at al. (1995) started a critique of the cognitivist approaches to expertise typical of the research conducted in the 1980s. Engestrom et al. identify three basic assumptions of these cognitive studies, which essentially see the human mind as working in a vacuum isolated from the context. Expertise is considered as universal and homogenous. In other words, there is one best way to do things. Moreover, expertise is about individual mastery of well defined and invariant problems. It is learned through practice and repetition, and is represented by the master-novice continuum. These issues characterize what Engestrom et al. call 'a vertical vision of expertise'. To the contrary, they argue, nowadays problems vary greatly; solutions do not last long and can seldom be applied to other problems: "expert must face, diagnose and resolve novel situations for which they have little or no directly applicable practice. Such factors create situations where employees at all levels of their hierarchy face tasks that they find impossible to solve" (Engestrom, 2004b, p. 146). The social dimension of expertise is also important, since workers work within and between teams to find hybrid solutions to the new problems they are faced with. This also implies that they work in different cultural contexts with different rules and tools. Furthermore, problems sometimes look complex, undefined and new so that there is a general feeling – even from the experts - that nobody knows the solutions. Moving to the other pole of the master –

novice continuum, people newly arrived are not merely a tabula rasa; they also bring knowledge from other work or school contexts. This is to say that, while they gain expertise, they also bring new ideas and contribute to shape the cultural environment they are working in.

Drawing from Victor and Boyontin's historical analysis of the form of work in Western societies, Engestrom (2004a, 2008a, 2008b) contends that the form of production called co-configuration is becoming dominant today. In co-configuration the client is part of the production process as they contribute to mould the good or service. One of the main characteristic of this form of production is negotiated knotworking, where a knot refers to "rapidly pulsating, distributed, and partially improvised orchestration of collaborative performance between otherwise loosely connected actors and organizational units. Knotworking is characterized by a movement of tying, untying, and retying together seemingly separate threads of activity people forms knot" (Engestrom, 2005, p. 316).

A new multidimensional vision of expertise is thus called for to study these new forms of production and organization. According to Engestrom et al. (1995) the classic vertical dimension of expertise characteristic of the cognitive studies should be questioned. Individuals do not work alone when solving problems and the cultural environment they are in is essential to understanding the solution that will be found. Different solutions will be put into practice according to the diverse contexts in which they will operate. Hence, a horizontal dimension of expertise enriches the vertical one. This emphasises that workers often move to other socio cultural contexts to find shared solutions, that is they cross the boundaries of their organizations, and work in groups with people to find innovative solutions to problems they have never been faced with before:

> In their work, experts operate in and move between multiple parallel activity contexts. These multiple contexts demand and afford different, complementary but also conflicting cognitive tools, rules, and patterns of social interaction. The criteria of expert knowledge and skill are different in the various contexts. (Engestrom et al., 1995, p. 319)

The term boundary crossing was introduced to stress how professionals at work need to "enter onto territory in which they are unfamiliar and, to some significant extent therefore unqualified" (Suchman, 1994, p. 25), and "face the challenge of negotiating and combining ingredients from different contexts to achieve hybrid situations" (Engestrom et al., 1995, p. 319). In another article, Engestrom (1996) further specified his view of human development, and therefore learning, which is not like climbing up a developmental ladder

(another metaphor used for the vertical dimension of learning), but should be seen as movement across borders. Furthermore, development can be collective rather than individual, and can be seen as discontinuous, as sometimes it can take the shape of a violent rejection of the old. In this new model of expertise, cognition is not merely restricted to the individual, rather, it is distributed in the community and in the artefacts used to perform the work activity. By so doing, expertise has been enriched to encompass the cultural context, the movement across different settings, teamwork and innovation.

Some scholars have attempted to synthesise the cognitive constructivists and the sociocultural theories of expertise. In her literature review on workplace learning, Tynjala (2008) contends that professional expertise consists of four tightly interwoven sources of knowledge: theoretical, practical, self regulative and sociocultural. Theoretical knowledge is connected to lectures and books, and is explicit. Practical knowledge is commonly referred to as skills; it is mostly implicit and it deals with learning by doing. The third knowledge important for professional expertise is regulative, and consists of the learner's reflection on their activities. The last source of knowledge is the sociocultural, and it can only be gained through participation in workplace activities. It consists of norms, rules, and patterns of activity characterizing a specific workplace. Tynjala (2008) suggests that such four sources of knowledge become expertise only through progressive problem solving, which makes them tightly interconnected to each other. This model is called integrative pedagogy, as it calls for an integration of the above mentioned different types of knowledge important for the professional expertise needed in today's fasting changing societies. Similarly with Engestrom et al (1995), Tynjala and Gijbels (2012) argue that more recently jobs require the capacity to deal with poorly defined and ever changing problems, as well as different environments. Hence, Tynjala's model of integrative pedagogy aims to shape learning environments helping students gain expertise useful to face fast changing workplaces and societies.

Learning at the boundary

Tynjala's model, applied to vocational education argues that, of the multiple types of knowledge, some coexist next to each other and others are seldom taken into consideration. Examples of the former could be theoretical, practical and sociocultural knowledge. Theoretical knowledge is learned mostly in the classroom, practical knowledge during workshops or work experience, while sociocultural knowledge is learned in the

workplace. On the other hand, regulative knowledge is seldom dealt with through diaries and discussions with peers, mentors and teachers. Overall, a space for progressive problem solving where these diverse sources of knowledge may be combined to generate expertise is often missing.

Hence, there is an unexploited potential in vocational programs, as they do not fully turn the sources of knowledge they deliver into expertise. A proper space would be necessary for students to think about their conduct between school and work, the practice in the light of theory and vice versa. The same space could be appropriate for progressive problem solving where students with their mentors and teachers could deal with the problems they have in school and work, so as to turn these problems into sources of learning. In summary, a workshop at the boundary between school and work experience in VET would be necessary to convert different sources of knowledge into expertise.

In the literature it has been suggested that a useful way to think of the relationship between school and workplace is in terms of a boundary crossing (Akkerman & Bakker, 2012). This can be seen as an enriched notion of transfer with three relevant differences (Tuomi-Gröhn, Engeström, & Young, 2003). Firstly, while transfer focuses on one direction, from school to work, boundary crossing sees the relationship as bidirectional, as school and work enrich each other. Moreover, while transfer sees this movement as individual, boundary crossing sees it as a social phenomenon (Saljo, 2003). Secondly, while transfer stresses the commonalities between the different practices, boundary crossing specializes in finding productive ways to interact, thus considering the differences as a positive source of learning. Thirdly, boundary crossing sees the workplace as a part of the schooling process.

In their literature review on learning at the boundary, Akkerman and Bakker (2011, p. 139) define boundaries as “sociocultural differences that give rise to discontinuities in interaction and action”. They argue that it is the similarities between the nature of sameness and discontinuity that make them of interest to researchers: “both the enactment of multivoicedness (both–and) and the unspecified quality (neither–nor) of boundaries create a need for dialogue, in which meanings have to be negotiated and from which something new may emerge” (p. 142). The authors contend that such growing interest in boundaries by education researchers should be understood against two

emerging phenomena in social sciences: the study of larger units of analysis, and the appreciation of diversity as source for learning.

Akkerman and Bakker (2011) identified four learning mechanisms at the boundary. The first learning mechanism is identification. In identification, “previous lines of demarcation between practices are uncertain or destabilized because of feelings of threat or because of increasing similarities or overlap between practices” (p. 142). This leads to renewed insight into what the diverse practices are about. The second group of studies entail coordination, and “analyse how effective means and procedures are sought allowing diverse practices to cooperate efficiently in distributed work, even in the absence of consensus” (p. 143). The third group concentrates on the studies regarding the reflective potential of boundaries, thus emphasising “the role of boundary crossing in coming to realize and explicate differences between practices and thus to learn something new about their own and others’ practices” (p. 144). There are two types of reflection at the boundary: perspective making and perspective taking. The former involves making explicit one’s understanding and knowledge of a particular issue. The latter is that the boundary makes it possible “to look at oneself through the eyes of other worlds” (p. 145). The fourth learning mechanism is transformation. These studies often take as a starting point a problem people are facing that obliges them to reconsider intersecting practices. Learning mechanisms such as reflection and transformation are often caused by a formative intervention known as the Change Laboratory, where people from different practices are invited to meet, discuss and work on shared problems at the boundary.

After having explained the types of leaning at the boundary useful for a model of integrative pedagogy in vocational education, this literature review will continue to examine critiques of the application of the competence approach in education in Italy and Australia, the two countries chosen for this comparative study.

2.3 Critics to the competence approach in education

In Italy, as well as in French speaking countries, a fierce debate is taking place following the introduction in school of the competence based approach. The dilemma is about knowledge versus competence. On the one hand, some scholars claim that the competence approach entered into schools after having failed in industry, thus marking the subordination of education to economy and harming the school’s humanistic tradition

and preparation of future citizens. On the other hand, other scholars value the competence approach as a solution to overcome the separation between theory and practice, and for the two worlds - school and industry, education and labour - to come to terms and speak a common language (Viteretti, 2011).

There are many reasons why the competence approach is opposed. For instance, Hirtt (2009) lists five causes: the goals behind this approach are connected to industry; theoretical knowledge is abandoned; it cannot be considered a pedagogical constructivism and actually it contrasts with the progressive pedagogies; and with its deregulation it enhances social differences. Similarly to Hirtt, Israel (2011) argues that defining the types of competences needed for a certain position in the workplace was problematic, because a company director eventually needs the same competencies as the lowest employee. In addition, many commissions and projects in the world tried to define competence without success. Despite its patent failure in the industry, such an approach has been transferred to school without being questioned. The main reason for its failure in industry was that it is not possible to measure the affective and motivational factors embedded in competence. Israel suggests that the only real strength of the competence approach is that it allows the validation of work related competencies across Europe. The European Qualification Framework, which measures learning outcomes in terms of competences, responds to this need for validation, but inevitably displays an anti-cultural approach where there is no room for literature, history or philosophy and it is all about technical and operative capacities. On the contrary, schools should be institutions which educate citizens and ground their freedom on culture, rather than a place where future workers are trained.

On the other hand, for many scholars (Ajello, 2011; Benadusi, 2011a; Pellerey, 2011; Ribolzi, 2011) this alleged opposition between competence and knowledge represents a false dilemma, since they can integrate one another. Following some British philosophers such as John White, McIntyre, Raz and Griffin, Pellerey (2011) suggests that knowledge and competence should be considered complementary forms of thought rather than opposites. The theoretical rationality prevails in the knowledge, whilst the practical rationality is evident in the competence: both are essential for the individual's education. The former is good to enrich the person in many ways, such as: sensibility to values, empathy and understanding, aesthetic appreciation and critical reflection. Furthermore, in the school of knowledge it is often hard to teach these values, because most humanistic topics are dealt with in a rather superficial and repetitive fashion, and therefore cannot

thrive in the individual. On the other hand, practical rationality can help theoretical rationality flourish (Pellerey, 2011). The competence approach overcomes the idealistic view of schools as places which transmit abstract knowledge not contaminated by practice. Rather than representing the crisis of disciplinary knowledge, the competence approach calls for the learner's involvement, emphasising the learner's path and objectives (Ajello, 2011). It is important to transmit the sense of what one is learning so that the person can make use of it, thus avoiding useless knowledge described by Engestrom (1991) as encapsulation. Educating to competence means establishing connections with meaningful social practices such as citizenship. This approach does not obscure the role of knowledge, which is emphasized by being put into action. By so doing, the competence approach promotes knowledge transfer outside school, so as to permit a full mastery and attribution of meaning to it. Most importantly, there is no contradiction between the two ideas that school should prepare students both for their future job and social life.

One of the limits of the old didactics based on disciplines is their incapacity to integrate the different sources of knowledge. According to Andreas Schleicher (cited in Viteretti, 2011), responsible for the PISA surveys commissioned by the OECD, we are experiencing a shift in the way we think of knowledge: instead of being considered as stored somewhere in the mind, it is part of a continuous circle of cooperation and communication. The competence approach is based on disciplines, but gives up to notionism and encyclopaedic knowledge. It still transmits the rigor of disciplines, but it calls for an integration of the various subjects, particularly the humanistic, scientific and technological ones.

The pedagogy of competence aims at bringing formal learning closer to non-formal and informal learning. In the new paradigm there are alternative ways to infuse theoretical knowledge in the students besides class lectures. School education is designed in the light of permanent education and according to the following principles: centrality of learning; unity of theory and practice; interdisciplinary modular teaching; project work and problem solving. The workshop modality concerns all the disciplines in order to overcome the traditional dichotomy between humanistic against scientific and technical culture: the primary methodological tool is to involve students in active learning and facilitate their transition to industry with work experience and apprenticeships (Gentili, 2011). According to Margiotta (2011) school acts indirectly on students by creating the conditions within

which they learn. Hence Margiotta suggests that competencies at school deal with the construction of a productive learning space.

Also, recent scientific discoveries have pointed out the limits of the teaching models based on the sole cognitive dimension where knowledge is acquired as pure transmission of defined structures and meanings that are already codified. The mind is deeply rooted in the person's body, and the process of acting, thinking and talking take place at the same time (Gallese & Sinigaglia, 2011; Mario, 2013). To the contrary, according to the Human Information Processing models popular in the 1970s, the sensory data are gathered, elaborated and then a motoric answer is produced as output (Margiotta, 1997). In the new models, perception is considered as an implicit preparation of the organism for action, where the relevant data are selected to frame the problem correctly. The motor system has a decisive role in the construction of meaning. Teaching for competence should thus see the individual as a unity of mind and body, cognitions and emotions, knowledge and decision (Gentili, 2011).

In Australia, the critiques the competence based approach receives are of a different nature. Vocational programs are delivered based on units of competency: "units of competence describe discrete workplace requirements and the knowledge and skills required that are needed to demonstrate competent performance for that workplace requirement" (DEEWR, in Whelahan and Moodie 2011, p. 14). Such units are based on a reduction of each job to its components, such as roles and requirements. A qualification comprises of a set of units of competence. A consequence is that this approach does not provide the appropriate theoretical knowledge to the student: the only bits of knowledge taken into consideration are the ones connected to the specific units of competency. Another problem of the competence approach in VET is that learning outcomes are connected to existing job descriptions, thus emphasising tradition, discouraging the development of innovative practices and ruling out the person's proactive behaviour as well as the reflexive one.

Given these problems affecting the competency based approach, some authors have suggested a move to the capabilities approach (Wheelahan & Moodie, 2011). Capacity in the workplace is "an emergent property of more fundamental, complex and wide-ranging knowledge, skills and abilities. Capacity arises from the inter-relationship between

personal, social and working lives, and that means learning for work needs to go beyond work" (p. 21). Vocations should thus be conceived as based on capabilities.

> Capabilities link individuals, education and work by identifying the individual, social, economic and cultural resources that individuals need to develop as autonomous, innovative and creative workers within broad vocational streams. Capabilities are differentiated from generic skills, employability skills or graduate attributes because they are not 'general' or 'generic'. In the capabilities approach, the focus is on the development of the individual and on work, and consequently students need access to the knowledge, skills and capabilities they need to work in their vocational stream. (Wheelahan et al., 2012, p. 10)

However, it should be noted that the European concept of competence appears to be different from the Australian one, and overcomes the issues of the Australian competence based approach in vocational education. As has been noted before, competence is a term affected by polysemy. In the European context, competence is about knowledge, skills and attitudes. Teaching in Italy is thought to be too theoretical, and knowledge is not turned into competence because it is not problematized in the light of practice. In contrast, in Australia competence refers only to skills and knowledge, while the attitudes are absent. A bottom up, molecular (and narrow) approach is used in designing training packages, and only the micro skills connected to a specific job position are emphasised. However, these do not become competence as they are not problematized in the light of deep theoretical knowledge.

The critiques of the competence approach by Hirtt and Israel, but also by Wheelahan and Moodie appear to focus on a narrow and functionalistic approach of competence which can be linked back to the rationalistic models. The holistic and interpretative approaches to competence seem to overcome most of the criticisms, and will be used for this research. Within the interpretative approach, competence will be seen as boundary crossing, and this will provide the setting and the environment (the Change Laboratory workshops) in which to stimulate the students' entrepreneurial behaviour. Within the holistic approach and in line with the DeSeCo project, the next section will present the European key competence for lifelong learning on the sense of initiative and entrepreneurship.

2.4 The competence of entrepreneurship

Similarly to the OECD, the European Union has also developed its own key competencies for lifelong learning. The European Commission definition states that "key competences are those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment" (European Commission, 2007, p. 3). In the same document it is stated that every European citizen must be equipped to adapt to globalization. Furthermore, the individual has to be proactive so that, not only s/he will be able to cope with change, but s/he will also contribute to mould it. Competence is considered from a lifelong learning perspective: school is not the only institution where the individual learns. Formal learning remains important, but next to it there are also non-formal and informal learning: one can gain competence in the workplace or in social life, and during recreational activities. In so doing, the process of becoming competent spans the individual's entire life. There is no doubt that the European key competencies have been conceived of within a holistic approach. These competencies for lifelong learning are listed in the table below.

Table 2-1 The European key competences for lifelong learning

Key Competencies for lifelong learning	
1	Communication in the mother tongue
2	Communication in foreign languages
3	Mathematical competence and basic competences in science and technology
4	Digital competence
5	Learning to learn
6	Social and civic competences
7	Sense of initiative and entrepreneurship
8	Cultural awareness and expression

Source: European Commission (2007), p. 3.

A possible way to measure the learning outcomes of the individual in terms of competencies is the European Qualification Framework (EQF). This was created by the Member States to connect the countries' qualifications systems. The aim is twofold: improving the citizens' mobility throughout Europe and promoting lifelong learning. In the framework, every competence, skill and habit is defined in terms of responsibility and autonomy according to eight levels (European Commission, 2008). Similarly to the EQF, Australia also has its own AQF which is based on 10 levels. Choosing the European framework for both settings will make it possible to make comparisons.

This research focuses on the seventh European key competence of the sense of initiative and entrepreneurship, which is defined in the table below.

Table 2-2. The 7th European key competence on the sense of initiative and entrepreneurship

Definition of the competence on the sense of initiative and entrepreneurship
Sense of initiative and entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. This supports individuals, not only in their everyday lives at home and in society, but also in the workplace in being aware of the context of their work and being able to seize opportunities, and is a foundation for more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance.

Source: European Commission (2007), p. 11.

In summary, this competence concerns the ability to turn ideas into action. Similarly to the other key competencies, it is composed of knowledge, skills and attitudes appropriate to the context. Knowledge includes the information relevant to identify available opportunities. It is also important to consider the wider context of where the person is operating, as well as the ethical dimension of their industry area. The skills most relevant to turning ideas into action are: planning, project management and teamwork, but also an individual's capacity to assess their own strengths and weaknesses. The attitudes include proactiveness, initiative, autonomy and self-confidence.

Similarly to the European competencies for lifelong learning, Australia has categories of generic skills. Interest in generic skills started in the 1980s, and culminated in 1992 with the Mayer key competencies useful in preparing youth for work (Australian National Training Authority, 2003). In the 1990 great energy was devoted to implementing Mayer's key competencies. More recently industry has refocused on these skills. Drawing on these studies, the Australian Chamber of Commerce and Industry and the Business Council of Australia conducted wide research on the generic 'employability' skills in Australia and overseas (Gibb, 2004). Recently the terminology has become an issue, and generic skills are named in different ways, often according to the sector they are used in, as shown in the table below.

Table 2-3. The Australian generic skills are referred to depending on the field

Example of terms when referring to the Australian generic skills
key competencies and general capabilities in Australian schools employability skills and associated attributes in the Australian vocational education and training (VET) sector graduate attributes or capabilities in the Australian higher education sector several other terms in other countries and international frameworks, including core skills, essential skills, generic skills, transferable skills, key competencies, graduate skills, graduate qualities, graduate capabilities, and 21st-century skill.

Source: Bowman (2010), p. 6

Even though "there is no one 'correct' term to use" (Bowman, 2010, p. 10), given the importance of having close relationships with industry, in VET generic skills are often referred to as employability skills. The definition by the Australian Chamber of Industry and Commerce & Business Council of Australia is: "employability skills are skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions" (Australian National Training Authority, 2003).

The employability skills are (Wibrow, 2011): communication, teamwork, problem-solving, initiative and enterprise, planning and organizing, self-management, learning and technology. Here it is argued that the Australian employability skills in VET are very similar to the knowledge, skills and habits embedded into the European competence of the sense of initiative. Similarly to the European sense of initiative, there is a reflective component, the ability to learn.

Given this definition and these attributes, this paper will focus below on entrepreneurship education, and will discuss how employability skills can be seen as socio-economic outcomes for entrepreneurship teaching.

2.5 Entrepreneurship education

In 2006, the OECD commenced the Entrepreneurship Indicators Program, which aimed at finding suitable indicators to compare the progress made in entrepreneurship by the OECD state members. One of the main problems facing the comparison was to find a shared definition for entrepreneurship, as every study focusing on this subject had used a different one. The next paragraphs will analyse the terminology and examine its history.

An historical perspective on entrepreneurship

In general, entrepreneurship is viewed as the capacity to find opportunities and consequently transform them into new ideas to be introduced in the market (Audretsch, 2003). The term was first used by Ricard Chantillon in 1730 to indicate each type of self employment. However, the first scholar to develop a theory on entrepreneurship was Joseph Shumpeter in 1934. The entrepreneur is a disruptor and the principal actor in innovation: s/he provides "new combinations", thus provoking changes in the markets which cause long term evolution and growth in the economy (Schumpeter, 1934). There are also other views on entrepreneurship (Ahmad & Seymour, 2008): the entrepreneur can be an opportunity identifier, as s/he discovers and quickly exploits previously-unnoticed profit opportunities. A third view sees the entrepreneur as a risk taker, by giving possible answers to the needs found in the market, and taking risks for this in the face of possible returns in the future. The fourth theory considers the entrepreneur as a resource shifter, as s/he endows existing resources with new wealth-creating capacity. A last view depicts him or her as a breakthrough innovator.

A clear distinction between entrepreneur and manager should be made. The first is a person with a vision and the ability to start a business. The second is an individual able to run a business successfully (Badawi, 2013). While many authors agree that entrepreneurship is a type of activity triggering innovation and change, such a term is intrinsically complex for at least two reasons (Audretsch, 2003). The first is that entrepreneurship is a phenomenon encompassing many organizational forms: the individual, groups and networks, projects, firms, and also bodies such as entire industries or even regions. The second source of complexity stems from the problem of how to measure results.

In their literature review for the OECD, Ahmad and Seymour (2008) shed light on three terms: entrepreneurs, entrepreneurial activity and entrepreneurship. The different definitions are displayed in the table below.

Table 2-4. Definition of entrepreneur, entrepreneurial activity and entrepreneurship.

Entrepreneurs are those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets. Entrepreneurial activity is the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets. Entrepreneurship is the phenomena associated with entrepreneurial activity.

Source: Ahmad and Seymour (2008), p. 14.

It seems that some cultures promote entrepreneurial behaviours better than others. In some societies the need for security is so strong that individuals prefer to obtain a position in a company rather than starting a venture. Individuals may become entrepreneurs by necessity or by choice. In the former case these people are generally respected, in the latter they are often discouraged by their families (Badawi, 2013).

Internationally, America is the role model in entrepreneurship. There are at least three reasons for that (Volkmann et al., 2009). Firstly, the United States has the highest number of high growth enterprises: Microsoft, Google and Apple to name but a few. Out of the 100 most important US companies, more than half did not exist 20 years ago. As an illustrative example, Google was founded in 1998 by two students at Stanford University - Larry Page and Sergey Brin, who started working in their garage, and only six years later their company was listed on the stock market. Secondly, the US has the most entrepreneurial-friendly culture. The garage, for instance, has been considered as the starting point of the Silicon Valley model. Thirdly, the US also has the longest tradition in entrepreneurship teaching. This started at the beginning of the 20th century, with organizations such as Junior Achievement. Generally speaking, entrepreneurship in higher education has been delivered only for 50 years. The first pioneering Universities were Kobe University in Japan in 1938 and Harvard Business School in 1947 (Martínez et al., 2010).

Entrepreneurship in Europe

Even though America is the champion of entrepreneurship, more and more developed countries are catching up. One example is the European Union, where, since the 1990s, promoting an entrepreneurial culture "has become the *sine qua non* of political response to globalization" (Gibb, 2002). In a Euro Barometer survey in 2009 (The Gallup Organization, 2010), EU citizens were almost evenly divided in their preference to be an entrepreneur or to be employed (45 per cent against 49 per cent). The fear to fail is an

obstacle to starting a new business, as well as the incapacity to identify opportunities. The average European entrepreneur is male and has a high school certificate.

In March 2000, with the Lisbon strategy it was decided to transform Europe into the most competitive knowledge based economy. The aim was to improve the Union in terms of economy, employment and social cohesion (European Commission, 2000). Enterprise education was identified as playing a primary role to attain these goals. In 2003, a Green Paper on "Entrepreneurship in Europe" discussed two issues related to entrepreneurship: why only few businesses in Europe are growing and why so few people in Europe start a business (The Gallup Organization, 2010). Another important step was the Oslo conference on entrepreneurship education in 2006. At the conference representatives exchanged experiences and good practices with the aim of improving entrepreneurship education in the Member States (European Commission, 2006). The goals of the Lisbon strategy have been renewed in the Agenda 2020 (European Commission, 2013). The intention is to extend education on entrepreneurship to all the levels of education. Entrepreneurship in Europe is also expected to improve the quality of education: "promoting the development of entrepreneurial attitudes in pupils from an early age means stimulating active forms of learning, that draw on the creativity and imagination of children" (European Commission, 2004, p. 20). The need to incorporate creativity, innovation and entrepreneurial attitudes is underlined in flagship initiatives such as Youth on the Move, an Agenda for New Skills and Jobs, and Innovation Union (European Commission, 2012a). Since 2006 the sense of initiative and entrepreneurship has been one of the eight European key competencies for lifelong learning (see Official Journal of the European Union, 2006).

Entrepreneurship teaching

A recent empirical study published by the European Commission (2012b) inspected the learning outcomes of entrepreneurship education. Results suggest positive outcomes on the European key competencies. Entrepreneurship education fosters youth's entrepreneurial competencies such as: mindset, intentions to set up a business, employability skills, and role in society and economy.

In her literature review on entrepreneurship teaching, Kozlinka (2012) contends that the outcomes for entrepreneurship teaching should be seen according to two levels: educational and socio-economic. The European competence on the sense of initiative and entrepreneurship focuses on the whole student and their lifelong learning, and

consequently can better represent the yardstick in term of educational outcomes for this comparative research. Regarding the socio-economic outcomes for entrepreneurship teaching, Kozlinska (2012) suggests that they can be measured according to three levels. The first level should be seen as an entry level, and concerns employability skills as capacity to get a job. In this respect, Smith and Comyn (2003) found that VET students adopt different strategies to improve their employability skills in the workplace. First of all, they make use of proactive behaviours: they ask for questions, develop social relationships, mix with the rest of the staff, and seek the most suitable mentor.

Kozlinska's second level of measurement of the socio-economic outcome for entrepreneurship teaching is intrapreneurship, which is defined as entrepreneurial behaviour within a company. In other words, employees find and exploit opportunities within their company, or take on a leading role within it, and consequently gain power to put into practice new ideas. The final and upper level is the creation of a new business. Following this classification, employability skills can be regarded as possible socio-economic outcomes for entrepreneurship education in VET, and will be used in this comparative project.

Across Europe the way entrepreneurship education is embedded into education can vary greatly (European Commission, 2012d). It can be delivered through existing subjects or be presented separately as a new topic. Throughout European primary schools entrepreneurship education is mentioned in two thirds of the Member States, and often taught as a cross curricular topic. In high school almost all the countries recognize such education, and entrepreneurship is taught as both a cross curricular and stand alone topic. At the university level, partnerships between education and business are regarded as desirable.

An important issue is the content of what students should learn to be entrepreneurial. The table below illustrates as examples twelve concepts young people should learn before getting their high school certificate, as suggested by the World Economic Forum (Volkmann et al., 2009).

Table 2-5. Twelve basic rules about entrepreneurship a high school student should learn.

The importance of mental and physical health	Leadership and giving back
The joy of business and opportunity recognition	Financial statements
The economics of one unit	The basic sales call
The laws of supply and demand	How to write a business plan
Do not compete but create a comparative advantage	The rule of 72 (necessary to estimate the number of years it will take to double an investment).
Wealth creation	
Marketing: putting yourself in the costumer's shoes	

Source: Volkmann et al. (2009), p. 31.

Moving from the learning outcomes to the process, according to the European Commission entrepreneurial education "should offer the students the tools to think creatively and to be an effective problem solver" (2009, p. 7). Concerning vocational education, there are actions that should be taken to foster the students' entrepreneurial behaviour (European Commission, 2009). First of all, companies should participate in the delivery of VET programs, and dual system countries (such as Germany) may be taken as models. Furthermore, young people should take part in projects and activities characterized by learning by doing approaches. The corresponding teaching methods should include not just lectures, but active methodologies like business games, computer simulations, ventures conducted by the students, project and teamwork, visits to companies and work experience. Guidance on entrepreneurship in VET is another essential ingredient to help youth understand the nature of an entrepreneurial career (Cedefop, 2011). All in all, schools should be entrepreneurial in the way they prepare students for their future (Cedefop, 2011).

Apart from these guidelines, which appear to be directed to organizational matters of entrepreneurship, it seems that the pedagogical component of entrepreneurship education is missing in the European debate. Studies on entrepreneurship have in the past attracted scholars specializing in economics rather than education. This is due to the fact that it has long been considered an individual and business related subject instead of an educational and socially oriented subject, as pointed out by Kyro (2006): "in order to advance the educational debate there is a need to combine contribution to entrepreneurship studies and address more attention to the dynamics of learning" (p. 65).

Heinonen and Poikkijoki (2006) outline a model for entrepreneurship teaching in the university context. They ground their entrepreneurial directed approach on Kolb's circles of experiential learning, where "reflective observation through abstract conceptualization

and active experimentation leads to concrete personal experience" (p. 85). Heinonen and Poikkijoki claim that an entrepreneurship approach should be based on learning by doing, but should also provide young people with opportunities to actively participate and to mould the learning situation. Intention is a necessary component, though some type of triggering event is needed to "learn to understand entrepreneurship" and "learn to become entrepreneurial" (Heinonen & Poikkijoki, 2006, p. 83). In this regard, they suggest that the triggering event for entrepreneurship is the acquisition of entrepreneurial knowledge itself. The goal of entrepreneurship education is infusing in university students "entrepreneurial skills and behaviour as a prerequisite for an entrepreneurial process" (p. 81). This model for entrepreneurship has been taken up by the European Commission (see Kozlinka, 2012), and is sometimes cited in European Commission documents as a possible approach for entrepreneurship education (see European Commission, 2012c, p. 19).

Here it is argued that there are some issues when Kolb's model of experiential learning is used for teaching entrepreneurship. In Kolb's theory learning is an individual phenomenon: "this process is portrayed as an idealized learning cycle or spiral where the learner 'touches all the bases'—experiencing, reflecting, thinking, and acting" (Kolb & Kolb, 2005, p. 194). Furthermore, "learning occurs through equilibration of the dialectic processes of assimilating new experiences into existing concepts and accommodating existing concepts to new experience" (p.194). In so doing, the social dimension of learning (and social entrepreneurship) is ruled out. Secondly, it is true that in Kolb's model, learning is a process of creation of knowledge, but this is internal to the individual, thus the dimension of social change is absent. This theory has been recently challenged as it does not explain why the sequence of four actions follow one another in the prescribed order, suggesting some rationale behind the sequence is missing (Engestrom & Sannino, 2012). Kolb's model does not provide a framework for social change and innovation and therefore it is not an adequate learning theory to underpin entrepreneurship. Moreover, Heinonen and Poikkijoki (2006) suggest in their model that knowledge of entrepreneurship itself could be a kind of triggering event, but this may not be enough to bring about change. Here it is suggested that individual and collective agency – thus the sense of initiative and entrepreneurship - is mobilized when the group is faced with an issue important for them.

A new theory to study entrepreneurship based on social change is needed. The theory of expansive learning within Cultural Historical Activity Theory is a suitable candidate to study the students' sense of initiative and entrepreneurship when they cross the

boundaries from school to work. Expansive learning privileges "communities as learners, on transformation and creation of culture, on horizontal movement and hybridization, and on the formation of theoretical concepts" (Engestrom & Sannino, 2010, p. 2). It is a theory of innovation: "learners learn something which is not yet there" (Engestrom & Sannino, 2010, p. 2), therefore none of Sfard's (1998) metaphors of learning explained above would account for it. The two relevant and complementary metaphors for learning should be "knowledge creation", and "participation, expansion or translation" (Engestrom & Sannino, 2010, p. 2). A laboratory of social change, the Change Laboratory toolkit, is the place where participants discuss real problems they are experiencing and find new shared solutions. In so doing, they mobilize their agency and sense of initiative. The triggering events could be mirror materials gathered through observant participation in the field, thus relevant for the actors involved in the change effort. Such mirrors are used to "stimulate involvement, analysis and collaborative design efforts among the participants" (Engestrom & Sannino, 2010, p.15). The next section will give an overview of the Change Laboratory and the cycle of expansive learning it is expected to trigger.

2.6 The Change Laboratory to promote expansive learning

As has been explained above, in vocational education there is an unexploited learning potential at the boundary between school and work experience. This can be unfolded through the Change Laboratory, a toolkit developed within Cultural Historical Activity Theory framework (CHAT). CHAT can be described according to five principles (Engestrom, 2001a).

First, CHAT considers an organization – either school or workplace - as a collective, object oriented and artefact mediated activity. The cognition is considered as 'distributed' among the community, tools, division of labour and rules. The focus is enlarged to encompass two or more activity systems, as it could be the network between the VET school and local industry. Secondly, an activity system is a source of multiple (often conflicting) points of view due to the different roles of the actors. Thirdly, each activity system takes shape and is transformed over a long period of time. As a consequence of this, the historical perspective of the activity system becomes crucial to understanding its present shape and how it could be transformed in the future. Fourthly, conflicts and contradictions are seen as a possible means of transformation and development of the

activity system. Fifthly, there is always the possibility of an expansive transformation of the activity system, the main result of this being the transformation of the object. As a consequence, some of the practices, members, division of labour, rules and tools change as well.

Expansive learning

In expansive learning, the very subject of learning moves from the subject to collectives and networks. At the beginning some members of the activity system start questioning the existing practice. As the contradictions of the activity emerge and become visible, the tensions become more evident. This is because more members do not accept the state of things, although it is not clear what should be done and learned. While more actors join in, they start making a collaborative analysis, and a model of a new form of practice is progressively thought through and implemented with the necessary adjustments. During expansive learning, the main transformation occurs in the object of the activity. The famous triangle of Engestrom (1987) may be useful in analysing and identifying relationships between the different elements composing the activity system: subject, rules, community, division of labour, instruments made of tools and signs, and the most important part of the activity system, the object and the outcome. The object is frequently referred to as raw material and is essential for sense making. For instance, in one of his famous studies on a children's care hospital in Helsinki, Engestrom (2000) sees the patient as the object, while a child's assessment is the outcome.

During the collective effort to conceive of a new practice, a collective theoretical concept of the activity is shaped. This process is called ascending from the abstract to the concrete, and was first theorized by Davidov (in Sannino, 2011a). A new basic theoretical idea, a germ cell, embeds the simple relationship of the new form of practice, and is progressively enriched to create a model or vision of the new activity system. Ascending from the abstract to the concrete is achieved through a number of epistemic actions, the learning actions of the cycle of expansive learning. These are (Engestrom & Sannino, 2010):

- Questioning, criticizing parts of the present practice;
- Analysing the problem to find the explanatory mechanisms. There are two types of complementary explanations: one is historical-genetic as the issue is traced to its origins. The other is actual-empirical, and the situation is explained through its inner relationships;

- Modelling the new explanatory relationship in a visible form that explains and possibly solves the problem;
- Examining the model. The new model is challenged to find its implications and potentials;
- Implementing the model in the practice with its applications and enrichments;
- Reflecting on the model to stabilize and generalize the new practice.

According to Engestrom and Sannino (2010) the cycles of expansive learning are distributed in space and time, and therefore are not always easy to observe. Even more importantly, there is a need within our societies to facilitate and support deliberate efforts of change. This is why different types of formative interventions have been developed within the Vygotskian legacy to facilitate transformations in term of cycles of expansive learning. In line with the Marxist tradition of revolutionary practice, theories are not just good to study and explain a social phenomenon, but also to bring about social changes in the practices (Sannino & Sutter, 2011). In accordance to this tradition, CHAT stands as an interventionist and activist theory for social change of practices. Within it, three types of formative interventions have been developed: the Clinic of Activity, the Fifth Dimension and the Change Laboratory. These are all based on two epistemological principles, ascending from the abstract to the concrete, which have been discussed above, and the double stimulation.

Double stimulation was first theorized by Vygotsky with the aim of helping the subject solve a problematic situation. Vygotsky saw human psychological functioning in the mediation of action through cultural tools and signs (Engestrom, 2011). In double stimulation two types of stimuli are given to the subject:

> The first stimulus is the problem itself. Human beings employ external artefacts which they turn into signs by filling them with significant meaning. These signs are used as second stimuli with the help of which the subject gains control of his or her action and constructs a new understanding of the initial circumstances or problem. Through this process, according to Vygotsky (1987, p. 356), the subject transforms a situation which is meaningless for him or her into one that has a clear meaning. (Sannino, 2011a, p. 585)

The Change Laboratory

Within CHAT, the Change Laboratory is seen as a tool to promote social change. In the Change Laboratory “the basic idea is to arrange on the shopfloor a room or space in which there is a rich set of instruments fir analysing disturbances and constructing new models of

work practice" (Engestrom, Virkkunen, Helle, Pihlaja, & Poikela, 1996, p. 1). The members of a pilot unit of a larger organization meet weekly for a couple of months (plus follow up) with the researchers and other representatives of the activity system (such as the management). Sometimes the meetings take the shape of boundary crossing, and members from the related activity systems (such as clients and providers) take part in the change effort.

The basic equipment to arrange a Change Laboratory workshop is a 3*3 set of surfaces on which to brainstorm about work activity, plus video recording of the meetings for later analysis. The participants sit in front of the surfaces whereas a person appointed as writer jots down their thoughts. These surfaces could be for instance three flipcharts which are used according to a vertical and a horizontal direction. The horizontal line represents the different degree of abstraction: on one side the mirror materials are shown.

Mirror materials are used to trigger discussion within the group and are gathered by the researcher through observant participation on the field. They can be videos, interviews, documents, charts, illustrating regular work activity but also issues. Mirror materials are "used to stimulate involvement, analysis, and collaborative design efforts among the participants" (Engestrom, 2011, p. 612). The participants should look at themselves 'in the mirror' and reflect on the work activity they are part of. The mirrors are also intended to help the participants see the problem from another point of view. The researcher gathers as many materials as possible during field research, and makes a hypothesis on the possible problems within and between activity systems. In order to trigger dialectics, during the workshops the researcher shows a selection of materials based on the hypotheses s/he has made. Sannino (2011a) contends that the mirror acts as first stimulus, it "is highly conflictual and its use is aimed at provoking and arousing agentive initiatives in the participants in the intervention" (p. 594).

At the other end of the surfaces there is the model/vision representing the model of work activity, the germ cell and its developments. In the middle there is a surface for ideas and tools at an intermediate level of representation. The horizontal dimension of the surfaces represents the necessary historical analysis of the activity system(s), which encompass the present, past and future. In the case of the flipcharts, this is represented by the different pages recording the outcomes of the previous meetings. During the meetings one can observe the discussion moving across the time line. For instance, the participants

could move from the discussion of the salient problem in the present to the past to trace its roots. From the past they could understand the basic contradiction and envision a new germ cell which would be progressively enriched and turned into a model to be realized practically.

This process – ascending from the abstract to the concrete - is one of the two principles characterizing the formative interventions. The other principle is double stimulation. In the Change Laboratory, the first stimulus is represented by the mirror material which unfolds the contradiction of the activity system and seeks to trigger dialectics within the group. The second stimulus, the one mediating the solution of the problem, is the new model of the entire activity. In such a highly mediated learning environment, the journey of the participants through the vertical and horizontal dimension of the surfaces promotes cycles of expansive learning.

Some cycles might be micro and take place over one meeting, hence being potentially expansive (Engestorm & Sannino, 2010). Another important aspect is that the six phases described above of expansive learning are prototypical. In other words, over the Change Laboratory workshops they do not necessarily take place in the same order as described, and some of them might not even happen. Nevertheless, a recent preliminary study on a Change Laboratory conducted in a university library in Finland seems to confirm the overall structure of the cycle of expansive learning (Engestrom, Rantavuori, & Kerosuo, 2013).

During the workshops the famous triangle of Engestrom (1987) can be shown and explained to the participants to assist in analysing work activity. Two or more interacting triangles can also be shown to help the participants think about interactions between the activity systems. Generally speaking, due to the principle of double stimulation, the triangle(s) has a mediating effect and can be modified by the group to make it mediate the solution to the problem more effectively. In this respect, Engestrom (2011) suggests that:

> An effective second stimulus is actively constructed by the participants. This does not mean that the second stimulus cannot be initially suggested or presented by the interventionist. In Change Laboratories the interventionists commonly suggest that the participants use the triangular model of an activity system as a template for analysis and design. However, while the participants may indeed use the offered template, they sooner or later switch to a model or instrument of their own, or at least modify and fill the template with their own contents. (p. 24)

Concept formation

In expansive learning the development of a model from a germ cell can be studied as collective concept formation (Engestrom, Pasanen, Toiviainen, & Haavisto, 2005). Generally speaking, theoretical concepts have been an object of interest for researchers because they are identified as driving the individual's conduct. However, they have been often studied as fixed entities belonging to the individual seen as isolated from the context. Engestrom et al. (2005) suggest that theoretical concepts could be better studied from a different point of view. Firstly, concepts are best understood when they are seen as collective and evolving historically. Secondly, they are produced by different points of view, so they are intrinsically debated and mutable. Thirdly, they orient the action to the future; thus they embed visions, models, and affects. Finally, they are best understood when they are challenged and tried in practice. Hence, doing concept formation shows both the vertical dimension of learning (from the germ cell to the full model) and the horizontal one, between different participants and points of view, the boundary crossing actions.

In this respect, Engestrom (2003) contends that the horizontal dimension of expertise, perhaps the most interesting one presently, can be inspected with the help of Cussin's theory of the cognitive rails. The basic metaphor is that of individuals exploring a territory. By walking through the same new territory, people discover new paths, but also repeat the ones made by the others. Progressively they get more and more familiar with the territory as some tracks become landmarks for all of them. In the theory of cognitive rails, the territory to be discovered is the new shared concept. The participants discuss and explore the concept along trails, which are new at the beginning, but tend progressively to be repeated by the individuals. In so doing, the participants stabilize the trails and therefore the shared concept. Concept formation during the Change Laboratory is particularly important as the researcher can trace and study concepts through the recordings and the artefacts made by the participants. Hence, the competence of the sense of initiative and entrepreneurship can be studied as a shared theoretical concept, and traced through the banners, open questions and recordings during the occurrence of the Change Laboratory workshops.

3 Methodological framework

This chapter will provide the reader with practical details of the research in the two contexts.

In the first section the two different settings and the timeline of the comparative research conducted in Italy and Australia will be examined. In both settings the first step was finding a vocational course suitable for the project. In essence this meant identifying a course in which students were taking extended periods of work experience during school. Once the suitable school had been found, it was necessary to obtain authorization to conduct the research and go through the ethics process. Only then could the presentation of the project to the students and their family start. This was followed by four months observant participation in the classes and in the students' workplaces. The project culminated with weekly Change Laboratory workshops over two months. Then a follow up of emails, interviews and meetings sought to collect the educational and socio-economic data for the research.

The second section of this chapter presents the instrument used in this project to gather data. This is a questionnaire with two parts. The first part is made up of multiple choice questions, and focuses on the knowledge, skills

Questo capitolo intende fornire i dettagli pratici della ricerca nei due contesti.

La prima parte esamina i due setting e la scansione temporale del progetto comparativo in Italia ed Australia. In entrambi i casi, il primo passo è stato la ricerca di un corso idoneo allo studio, ove cioè gli studenti potessero intraprendere percorsi prolungati di stage. Una volta trovato l'istituto, si sono dovuti ottenere i permessi per effettuare le ricerca più le autorizzazioni etiche; solo allora il progetto è stato presentato agli studenti ed alle famiglie. Questo è stato seguito da quattro mesi di osservazione partecipante nelle classi e nei luoghi di lavoro, ed è poi culminato con i laboratori a cadenza settimanale per un arco di due mesi. Successivamente, un follow up costituito da email, interviste ed incontri ha cercato di raccogliere i risultati d'apprendimento educativi e socio-economici.

La seconda parte del capitolo presenta invece gli strumenti utilizzati per la raccolta dei dati. Si tratta principalmente di un questionario diviso in due parti. La prima parte è costituita da domande a scelta multipla e raccoglie dati sulle conoscenze, abilità ed attitudini che caratterizzano la settima competenza chiave europea sul senso d'iniziativa e

and habits informing the 7th European key competence of the sense of initiative and entrepreneurship. The second part of the questionnaire aims to discover the meanings attributed by the participants to the sense of initiative and entrepreneurship, the Change Laboratory workshops, and the entire project.

This chapter will first consider the quality assurance of this research.

d'imprenditorialità. La seconda parte è invece composta da domande aperte, che sono ritenute più idonee per esplorare i significati connessi al senso d'iniziativa e d'imprenditorialità, ai Change Laboratory ed al progetto complessivo.

Il capitolo inizia considerando gli aspetti relativi alla *quality insurance* della ricerca.

3.1 Quality insurance

As reported by the RIN (Research Information Network, 2010) quality assurance and assessment are important for a variety of reasons. As funds are limited, they must be targeted to the best research projects and researchers. Quality assurance is also valuable in ensuring that research plans are carried out properly, efficiently and effectively. Once the project is finished and results are prepared to be presented, controls are necessary to verify that what is published is of high quality. According to the same document of the RIN, measures to assure and assess the quality of research plans vary greatly across fields and disciplines, but can be seen as a six step process: programme and project proposals, monitoring and oversight during projects, sharing early findings with colleagues, formal publication, data sharing, post-publication assessment and review. The following paragraphs will describe how quality assurance has been carried out in this research.

First, this doctoral project has been overseen by two institutions, the Ca' Foscari University and the University of Melbourne, with different stringent criteria to ensure the quality of research. In addition, having two supervisors from two diverse institutions and with different competencies ensures quality. The supervisor at the University Ca' Foscari was particularly knowledgeable about the area of the research, entrepreneurship and sociocultural studies of competence. The Australian supervisor's expertise was in VET and comparative educational policy models.

Moreover, ensuring that the theoretical model is applied correctly is of utmost importance for the quality of research. While thinking about entrepreneurship teaching within sociocultural studies, in 2011 the researcher had the opportunity to attend a month

long course on 'Activity Theory and Formative interventions' at the Helsinki Summer School. There he learned about formative interventions and the Change Laboratory directly from its theorists: Yrjo Engestrom, Annalisa Sannino and other scholars. This research project was presented twice to Annalisa Sannino, who acted as principal investigator. The first time was during the Helsinki Summer School in 2011, and the second was in February 2012. This project was also presented twice to Professor Anna Maria Ajello (at the University of Rome 3), an Italian leading expert in sociocultural studies and competence.

Peer reviewing is also important for quality assurance. This research project has been presented and discussed in four different summer schools (Siref – The Italian society for pedagogical and formative research - 2011, 2012, 2013; University of Brixen 2013). In October 2012 this project was also presented at the CRADLE (Centre for Research on Activity, Development and Learning at the University of Helsinki) and discussed with the doctoral students and other experts in CHAT.

Peer reviewed publications are a final and important element of monitoring quality of a research project. This research has been published five times. Two articles have been published in the Italian journal *Formazione & Insegnamento*, two in *the European Journal of Education and Teachers Training*, and one has been accepted for publication by the Italian journal *Scuola Democratica*. Three articles have been written in English and two in Italian. These are all peer-reviewed journals.

3.2 The two different settings

At the Helsinki Summer School 2011 the researcher was initially discouraged from setting up two Change Laboratories, as one usually generates sufficient material for a PhD dissertation. This is because of the massive work of preparation and data analysis that a Change Laboratory generally requires. However, the researcher with the aid of his supervisors chose to set up two Change Laboratories, and compare the two settings to identify elements of entrepreneurship teaching which could be generalized to other vocational education contexts. This chapter will explain the decisions made by the researcher to adapt the Change Laboratory for a comparative project on entrepreneurship teaching and make it manageable. These decisions concerned the selection of the participants, data gathering and data analysis, and will be examined in the sections below.

This research was conceived of as a comparative project. In addition to Italy, the researcher aided by his supervisor and the doctoral school coordinator, were looking for a country where it would be possible to compare the Italian VET system with a very different system. It was decided this should not be a European system, as the educational policies of the Member States are converging. Australia provides an example of a very different VET system, and thanks to the agreement between the two Universities it was possible to set up a partnership.

An important difference between the two contexts is where vocational education is delivered and whether it allows the student to continue his or her studies at the university. In Italy primary education is five years in duration, and secondary education is divided into two parts: lower secondary is 3 years and upper secondary is 5 years. In Australia education is delivered differently according to the state or territory; in Victoria primary school is 6 years and secondary school is 6 years. Thus in Italy a high school diploma takes 13 years to complete while in Australia it takes 12 years.

In Italy technical institutes specialize in delivering vocational education, and once the student has chosen the school and the course s/he wants to undertake, all the subjects are mandatory. After graduation, the student can continue to tertiary studies. By way of contrast, Australian colleges always deliver general education, although most of them also have vocational courses. There is a certain degree of freedom, and students can choose the subjects they decide are suitable. In the Australian state of Victoria, where the project has been conducted, at the successful completion of general studies the student is granted the Victorian Certificate for Education (the VCE) which enables a student to undertake tertiary studies. Students in Years 11 and 12 can also choose a hands-on option that provides work-related experience beyond basic literacy and numeracy skills. This is called VCAL (Victorian Certificate for Applied Learning) and, similarly to the VCE, is an accredited secondary certificate. However, unlike the VCE, VCAL alone does not enable a student to go on to undertake tertiary studies.

In Italy a technical Institute for Building Surveyors was found in the Lombardy region. Two classes were selected, at that time Grade IV classes with 17 year old students, and the core of the project (work placement and Change Laboratory workshops) started at the beginning of Grade V. In Australia a Catholic College (secondary school) in Melbourne's suburban area provided the comparison study. The class was undertaking a Certificate III in

Childcare: this course was jointly delivered by the college and a Registered Training Organization (RTO). The RTO provided the teachers, materials and work placements. With its links with the other schools in the district, the Catholic college found the students suitable for this course. The students were in Years 10 and 11 - that is 16 and 17 years old. It is therefore important to note that students in Italy were at least one year older than their Australian counterparts.

The table below depicts the comparative project timeline.

Table 3-1. Timeline of the overall project.

Year	2011		2012				
Month	Nov/Dec	Jan/Feb	March/Apr	May/Jun	Jul/Aug	Sep/Oct	Nov/Dec
Italy	RA	OP				CL	FU
Australia			RA	OP	CL		FU
Legenda: RA= Requesting Autorzations OP= Observant Participation CL= Change Laboratory FU= Follow-up							

The table summarizes the comparative research project conducted in Australia and Italy from November 2011 to December 2012. In Italy the project started at the end of 2011 with a request for the necessary authorization to carry out research at the technical institute and the presentation of the project to the students' families. It continued in January and February 2012 with observant participation in the two classes involved, and culminated in September and October 2012 with eight Change Laboratory workshops. In Australia the project started in March and April 2012 with the search for an adequate setting and requesting authorization as well as seeking ethics approval. It was only possible in May 2012 to start the observant participation in the class involved and this continued until August of the same year. At the same time, six Change Laboratory workshops took place from July to August. In both settings, the remainder of 2012 consisted of following up with interviews, emails, questionnaires and meetings. In December 2012 all the data were collected and the researcher was able to start data analysis.

Having provided the reader with a timeline of the comparative research project, the following paragraphs will describe the different phases of the research in more detail. These are: requesting authorization and ethics; field research; selection of the participants; the Change Laboratory workshops and a description of the mirror materials used over the workshops; and the follow up.

Requesting authorizations and ethics

The path to obtaining the permission to conduct research was quite different in the two countries. In Italy there is no ethics process to be undertaken. The project was first introduced to the school principal of the technical institute for building surveyors. The principal judged that the project was suitable for her school and organized a meeting with the researcher and the construction teachers of two classes appropriate for the project, at that time Grade IV classes, equivalent to year 12 in Australia. In that meeting the researcher explained to the teachers the aim and the modality of the project. The teachers agreed that the project was interesting and feasible. It was decided that the teachers would look for employers where the students could undertake block work experience using their connections with the local industry. The same teachers also introduced the project to the respective class councils who gave the project formal approval. The project was eventually presented by the researcher to the families of the students who might be involved. It was made clear to the families that in the classes only 15 out of the 45 students could take part in this experience. At the same time, the project was presented by the school principal to the local chamber of commerce and the regional school office to look for funding.

In Australia the process was longer. Through the connections of the Education Policy and Leadership unit at the Melbourne Graduate School of Education, a day visit in a Catholic College located in Melbourne's suburban area was organized, and a suitable vocational course was found. The project went then through the authorization of the Regional Board of the Catholic Schools in Victoria. Contemporaneously, a request for ethics approval at the University of Melbourne was submitted. This was a two stage process and took more than two months. Once this was completed it was possible to present the project to the students and to start the observant participation.

The observant participation in the school environment and in the workplace

Field research is important in CHAT as the researcher must understand the cultural environment of the subjects participating in the research. Only by walking in the participants' shoes will the researcher make suitable hypotheses on the contradictions underlying the ruptures of the daily activities (Sannino, 2011a). Observant participation is necessary both in the school and in the workplace as there may be issues facing students

in both activity systems. Historical analysis is equally important in CHAT as only by understanding the history of an activity system can one envision its future (Sannino, 2011a).

Another reason why field research is important is to gather the materials to be shown during the meetings. Generally speaking, the researcher avoided interviewing those people (students, teachers, work tutors) expected to attend the workshops and, instead brought within the workshops opinions, critics and points of view from other key people. The aim was to enrich the workshops.

The table below summarizes the field research conducted in Australia and Italy.

Table 3-2. The field research in Italy and Australia.

Observant participation		**Italy**	**Australia**
In the school	Logistics	2 months, twice a week in each class	4 months, once a week
	Materials gathered	Field notes and documents	Field notes and documents
	Videos/interviews	6 teachers (2 vice school principal, 1 responsible for work placement) 12 students 1 school principal	3 teachers
In the workplaces	Logistics	2 months once a week	2 months once a week
	Materials gathered	Field notes	Field notes
	Videos/interviews	4 work activities 2 work tutors	3 childcare centre directors 3 work tutors

The rows identify field research conducted in schools and workplaces. In Italy observations in the field were carried out twice a week in each class over two months. In Australia the observations were carried out once a week over four months. In Italy the researcher was able to interview six teachers; two of whom were vice-principals and another was responsible for work placements. In the same setting, he was also able to interview twelve Grade IV and V students who had undertaken two weeks' work experience the year before. By way of contrast, in Australia it was not possible to interview the students of the childcare course. The researcher was able to interview three teachers of the class involved in the research. In both contexts there was no issue in writing field notes (in Australia the researcher took notes on the computer) and in collecting

documents on entrepreneurship and class materials such as handouts, tests, projects, and the like, as well as chatting with the students.

In Italy and Australia field research in the workplaces was carried out over two months contemporaneously with the workshops. In Italy it was possible to videorecord the students participating in the work activities in four different settings and interview two mentors. In Australia the researcher interviewed three childcare centre directors and three work tutors.

In Italy field research started in January 2012. For two months, the researcher would go into the two classes and sit and chat with the students. He would attend the lessons and the other activities such as workshops, physical activities, tests. During this period the researcher could interview students even from classes other than the two involved in the research that had gone through a short work placement the year before, and inquire about the meaning of their work placement with respect to the competencies they had gained. Other interviews were conducted with teachers of the classes, the vice school principal, and the teachers who were and had been responsible for work experience. In so doing the researcher also aimed to trace the history of the school. A second period of observations was undertaken in September and October 2012, when the Italian students were going to the workplaces every day and attending the Change Laboratory workshops on Thursday afternoons. Field research was carried out in the form of half day visits mostly to the building sites. In this case it was possible to videorecord the students taking part in the company's work activities.

In Australia the observant participation was done twice a week for four continuous months. From May to August 2012, when the Change Laboratory workshops were taking place, the researcher would also visit the students' workplaces where the students interacted with children and toddlers. The researcher could also interview the work tutors and the directors. As none of them were able to join the workshops, showing their interviews during the workshops was a way to have their opinion voiced.

Recruiting the students

In both cases participation in the project was voluntary. While in Italy the students had a particular incentive, the ability to undertake a long period of work experience, this was already available for every student in Australia. This is why participation was high in Italy and more limited in Australia.

One issue during the research was the number of students that could participate in the Change Laboratory workshops. The literature did not provide guidance on how many people should take part in the workshops: the Change Laboratory is often conducted in "a relatively independent pilot unit in a large organization" (Engestrom & Sannino, 2010, p.15), as could be the case in a class (the pilot unit) in a school (the larger organization). During the Helsinki Summer School it was suggested to the researcher that fifteen is the ideal number of people in the workshops to allow everyone the possibility to participate. Less than 10 would probably limit the points of view, and it would thus be more difficult to trigger dialectics. By way of contrast, with twenty or more participants it would be difficult for every participant to contribute. It was decided that the ideal group size of the workshops was fifteen people, plus the researcher. As teachers and work tutors would also be needed to input relevant points of view in the workshop, the idea was to select a dozen students.

In Italy this meant that, out of two classes and forty five students, only one fourth could be granted work placement and workshops. It was clear that this selection could create tensions as the project looked attractive in the students' eyes for the long work experience component during school that could be put on the students' résumé. Another element of attraction was that workshops would be organized to facilitate the coordination between school and work. Students would not be left alone in the workplace, and this experience could not turn into cheap labour for the employers. A last element making this research attractive was the participation of three universities: Venice, Melbourne, Helsinki, and the interest this had triggered in the local media, both television and newspaper. Indeed, the school principal had informed the local media of this initiative to show how her school courses were cutting edge.

In the two classes, the construction teachers made the criteria for participation clear to the students. The first criteria would be their marks. Since the project was expected to start in September, the same period of the remediation exams, no student could have a topic to remediate at the end of the school year in June. A second element taken into consideration was the student's proximity to the workplace selected for the project. This was because only few students can drive, and reaching the workplace using public transport was expected to be complicated. The third criterion for selection was the student's intention to find a job after graduation rather than continuing their studies. Students could put this experience in their CV and be assisted in the job search. Moreover,

an employer could express their interest to take on the student after his/her graduation. After applying these criteria, only one student refused the offer to join in, and thirteen students were selected.

In Australia the class was made up of seventeen students. When the project was presented the hope was that all of them would be interested in participating. However, unlike Italy, work experience was already available for every student. The school principal gave his permission for the research, but never came to the workshops to see what was happening or advertised the endeavour. As will be described in Chapter 7, in the class the atmosphere was rather negative and students appeared resistant. As a consequence, many students saw this project as additional homework, and refused to join in: in the end only five students participated in the project. Hence, the Australian pilot group was very small. However, this allowed each student to input and actively participate. In the end this group was very pleased to have participated in the research: they were able to create a very special and close relationship with their teachers and career counsellor.

The Change Laboratory workshops

The following table summarizes the main numbers of the Change Laboratory workshops in Italy and Australia.

Table 3-3. The Change Laboratory workshops in numbers.

Change Laboratory		**Italy**	**Australia**
Participants	Students	13	5
	Work Tutors	4	0
	Teachers	3	2
Occasional Participants	Work Tutors	2	0
	Teachers	2	1
	School Principal	1	0
	VET coordinator	0	1
Number of meetings		8	6
Logistics	When	Thursdays from 2 pm to 3 30	Tuesdays from 1 to 2 pm
	Where	At the school	At the school

The table first identifies the participants in the meetings, and makes a distinction between the people who participated almost every time and the ones who came only once or twice. For each person in every setting the participation was voluntary. In Italy thirteen students took part in the workshops while there were five students in Australia. In Italy four mentors and three teachers also participated in the meetings, while in Australia two

teachers took part in them. In Italy another two work tutors, two teachers and even the school principal came to observe the dynamics of the Change Laboratory. By way of contrast, in Australia only the teacher/course coordinator and the VET coordinator came. Eight meetings were held in Italy on Thursdays and six in Australia on Tuesdays. In Italy they would last one and a half hours, while they lasted only one hour in Australia. In both contexts the participants would meet in the school in a meeting room, not in the rooms where the participants would attend their regular lessons.

In this respect Engestrom et al. (1996) suggest the workplace to be a good place to hold the meetings (rather than the school). In this research the initial idea was to meet outside the school in the workplace, so that the students could feel freer to intervene, and it would have been probably easier for mentors to join in. However, in both contexts the school turned out to be the most convenient place to meet from a logistical point of view and because of the materials needed: a big table, projector, and flipcharts.

In Italy there were eight weekly workshops which started at the end of August 2012. The first meeting took place on a Saturday morning, and only the students, the researcher and the school principal participated. The two construction teachers, the humanities teacher/vice-principal and at least two work tutors out of four also participated in the other Thursday meetings. In Australia the workshops started in July 2012. The students, the career counsellor, and most of the time the teacher, took part in the six meetings. In both settings, each meeting would last one hour or more.

In both settings the participants sat in a semi-circle and faced the screen where the mirror materials were projected. According to the principle of double stimulation applied to the Change Laboratory the mirror materials act as first stimulus - the conflict or the problem the participants are faced with (Engestrom, 2011). In this project, these were represented by interviews of work tutors or videos showing the students' work activity. In Australia the researcher avoided showing videos of students involved in the project during their work activity during the meetings. This was because the young participants were interacting with children and this could cause privacy related issues. Furthermore, the Australian students were rather shy, and did not like to see themselves in the mirror. By way of contrast, in Italy there was no issuing in showing the videos of the same students participating in the workshops.

The same surface on the wall was used to project a Power Point presentation useful to keep track of each meeting. In this respect, at the end of each meeting, the researcher would listen to the audio recording and make a summary of the workshop in the form of bullets on a new slide. This was used in the following meeting to recall the main issues of the previous workshop, thus giving a sense of continuity over the course of the Change Laboratory workshops. This strategy was taken from Feuerstein's phases of the lesson to make the lesson a mediated learning experience (Feuerstein, Feuerstein, & Falik, 2010). Another useful strategy to remind the participants about the time before was to start the meeting by reading aloud the sentences that had triggered discussion during the previous session.

The Power Point was also used to show the outcomes of the meetings other than the Change Laboratory workshops. This was used in the case of the VET coordinators' meeting and class councils that could have been of interest for the students. The Power Point presentations in the two settings were also useful to depict schemas or diagrams at intermediate level of representation so as to help the participants to envision the future of work activity, as suggested by Engestrom et al. (Engestrom, 1994).

In the Italian setting the presentation was also used to show the outcomes of a questionnaire on the sense of initiative and entrepreneurship administered to the students, teachers and work tutors in the first and second meeting. In Italy also two flipcharts were made available in the room. While the Power Point and the videos were projected in the middle of the wall, the flipcharts were placed on the left and on the right. A student appointed as scribe would jot down the main points as they arose in the meeting. The other flipchart was used to make a schema, for example of new ideas, concepts or summaries of the workshop. For the same purpose in Australia students were given posters. In Italy and Australia the banners of the students were digitalized and put on the Power Point as well to keep track and be projected when deemed appropriate. The most interesting diagrams are described in the results of the research as artefacts representing shared concept formation. Seen from the principle of double stimulation these posters and schemas are the second stimuli, the ones made (or adapted) by the subjects to mediate the solution of the problem.

Another important element was to establish a cooperative climate during the workshops so as to make the students feel free to contribute. The researcher tried to

moderate the group by not intervening too much and leave as much space as possible to the participants. He encouraged the students to intervene and participate actively in the meetings. Sometimes the students were shy, but most of the time, especially after having watched a mirror material, they would advance their point of view and the discussion would become animated.

For the same reason the meetings were organized and managed in a flexible way. The researcher always prepared the materials to be presented during the workshops beforehand: the summary as well as the mirror materials (videos, charts and documents). Each workshop (except the first) always started with a summary of the previous meeting. Then the conversation would start, prompted by the mirror materials, ideas or questions from the teachers, mentors and students. Only when it was clear that the discussion was finished would the researcher propose a different material for discussion.

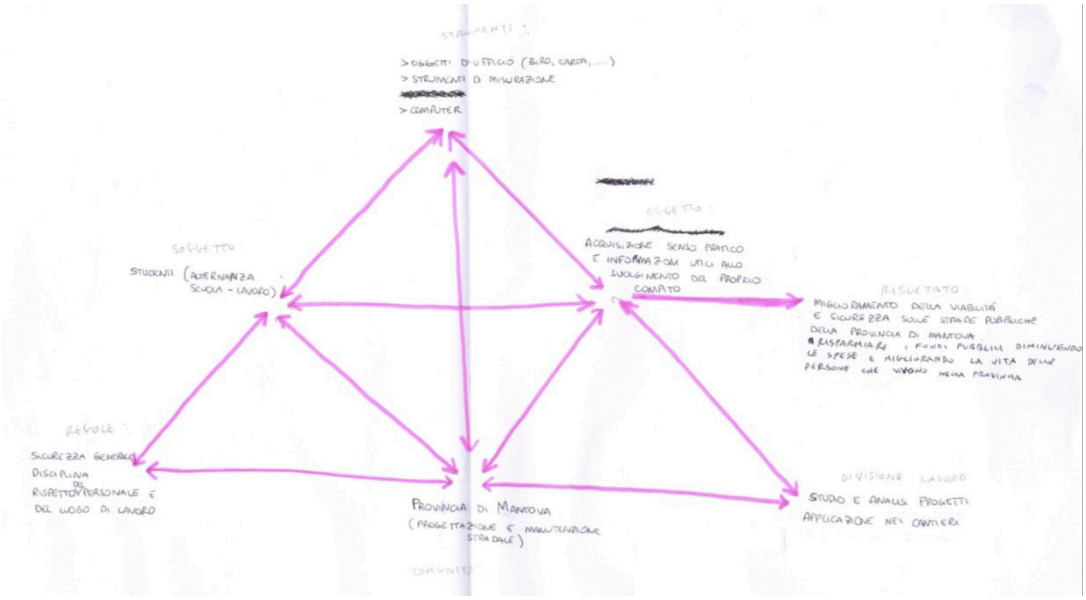
Of course the participants had to be accustomed with the semiotic tools of the Change Laboratory. Some knowledge about the Engestrom triangle (1987) and the cycle of expansive learning (Engestrom & Sannino, 2010) was necessary for the participants to understand the meaning of the workshops, that is, analyse their work activity in a systemic way, looking at the interactions between the subject, the object, the rules, the division of labour, the community and the tools. To do so, the first meetings were used to show the participants the triangle of Engestrom and to give the participants practical examples.

In the Australian setting the researcher projected the Engestrom triangle (1987) and gave examples of rules, division of labour, tools, community, object and tools related to the class environment. Next, the group was asked to use their workplace as an example of an activity system. Using the triangle as an analytical tool, they were asked to give examples of rules, division of labour, community, object and tools in order to think about how these elements are connected to each other. Only in the second meeting was the object of analysis enlarged to two interacting activity systems, school and workplace, seen with a common shared object – the students' learning. This work proved to be successful, as the participants became accustomed to using the triangle to analyse the interconnections within and between activity systems. The teacher, for example, acknowledged her 'sympathy' for the Engestrom triangle, which was useful in seeing how the elements which comprise an activity system are interwoven. One should not consider

an element as stand alone, because most of the issues or resources emerge from the interconnection with the other elements.

In Italy the activity to familiarize the participants with the tools of the Change Laboratory was slightly different. The first lesson was used to explain to the students the Engestrom triangle (1987) and give examples of its elements within the school environment. After that, the students were split into groups according to the workplace they were working in and given a poster. They were asked to use the Engestrom triangle and think of the division of labour, community, rules, tools, object and outcome of their workplace seen as an activity system. Following this, each group explained their banner to the rest of the class. The image below, for example, depicts the banner made by the group working at the local government.

Figure 3-1. The Engestrom triangle is used by the students to illustrate their workplace.



In the triangle are presented the tools (at the top), the student subject (middle left), the object and outcomes (middle right). At the bottom, from left to right there are: rules, community and division of labour.

During the second meeting, the researcher summed up the main concepts of the Engestrom triangle and introduced the idea of multiple interacting activity systems. However, during the workshops the group in Italy seldom made use of the Engestrom triangle to problematize the issues emerging from the discussion and to see their relationships with the other elements of the triangle, as did the group in Australia. This is probably because the teachers and the work tutors were not present at the first meeting.

In the second meeting the triangle of Engestrom was summed up, but probably this was not enough for teachers and mentors to understand its heuristic power.

The cycle of expansive learning was also projected over the meetings in the two settings to show how the design effort tends to pass through different phases (Engestrom et al., 2013).

The mirror materials

The table below gives an overview of the mirror materials used - shown by the participants in Australia and Italy.

Table 3-4. Type of mirror materials shown to the participants in Italy and Australia.

Mirror Materials		**Italy**	**Australia**
Videos of Activity	Students participating in work related activities	2	
Video Interviews	Students' interviews	1	
	Work Tutors' interviews	1	1
	Childcare centre director		2
	School principal	1	
Slides	Outcomes of meetings	class council	VET coordinators
	Materials on the sense of initiative and entrepreneurship	Data on the questionnaire on the 7th European key competence How employability skills are seen in Australia	

In the rows the mirror materials have been divided into three broad categories. The first category is represented by the videos showing the students' activity in the workplace. During the workshops in Italy two videos of different building sites' activities were used to trigger discussion. A second category of mirrors is made up of the interviews with key people. In Italy, three interviews were used: one depicted a student, another a work tutor, and a third the school principal. In Australia three interviews were utilized as mirror: one depicted a work tutor, while another two depicted a childcare centre director. A third category of mirror materials was projected in the form of slides. These may be outcomes of meetings that took place elsewhere. In Australia a table summarized the outcomes of a meeting held the day before between the RTO course coordinator of the course and VET coordinators. Similarly, in Italy the outcome of a class council was projected during the workshops. Also the outcome of a questionnaire on the 7th European key competence and

pictures on the Australian employability skills were used during the Italian workshops as mirrors.

The data gathering

In addition to the RTO course coordinator, the researcher only sought feedback from the people who had taken part in the Change Laboratory workshops. The table below summarizes how follow up was carried out in Italy and Australia.

Table 3-5. The follow up actions in Italy and Australia.

Follow up			**Italy**	**Australia**
Type of questionnaire	Pre-test	Quantitative	Completed during the first meeting, used a mirror material	Completed during the first meeting but was not used
	Post-test	Quantitative	Completed during the last meeting	Completed at home
		Qualitative	Completed during the last meeting	Completed via phone interview
Respondents to the questionnaires	Students		13	4 (5 for the qualitative part)
	Work tutors*		3	
	Teachers*		3	2
Follow-up	Meetings			VET coordinator and career counsellor RTO's coordinator
	Emails		3 teachers (twice) 1 school principal	
* Respondents to the qualitative questionnaires only.				

The first row outlines the type of questionnaire, quantitative or qualitative. The quantitative part of the questionnaire was administered twice, once at the beginning of the workshop series as pre-test, and once at the end of the workshop series as post-test. The pre-test was used only in Italy as mirror material. The qualitative part was administered only as post-test. For the post-test, in Italy both the quantitative part and the qualitative part were given to the participants during the last meeting. By way of contrast, in Australia the qualitative part was completed through a telephone interview, while the quantitative part was filled out at home.

In Australia the follow up was enriched by two meetings. One meeting was with the VET coordinator and the career counsellor of the school, while the other was with the RTO's course manager. As the researcher was in Australia at that time, in Italy the follow up was only possible through emails to three teachers and the school principal.

3.3 The questionnaires

This section will describe the questionnaires used to measure the outcomes of the project on entrepreneurship teaching. The questionnaire, in English or in Italian according to the setting, is composed of two parts. The first part is quantitative and focuses on the knowledge, skills and habits related to the European key competence of the sense of initiative and entrepreneurship. This part sought to understand to what extent students felt they improved this competence over the project, their self perceived level based on the European Qualification Framework (EQF), and how the relative attribute was seen as important for their professional expertise. This part was self-reporting and thus was given only to the students. The original version was written in English and later translated into Italian.

The second part of the questionnaire was qualitative. From a sociocultural point of view, it was important to understand the meanings attributed by all participants to the experience. Hence not only students, but also teachers and work tutors filled out the questionnaire. In this respect, answers to open questions can account better for the meaning attributed to the Change Laboratory workshops and the 7th European key competence, since the subject can display his/her subjectivity and understanding. The original version was written in Italian and was later translated into English. For quality assurance reasons both questionnaires underwent a process of selection of the items and wording made by a panel of experts.

The choice of the questionnaires may appear unusual, as at the CRADLE (Centre for Research on Activity, Development and Learning) at the University of Helsinki each Change Laboratory meeting is transcribed and conversation analysis is carried out. This was not possible with two Change Laboratories in two different languages. Furthermore, the attention of the researcher was on how the sense of initiative and entrepreneurship was thought about and triggered during the workshops. It was therefore decided that the quantitative questionnaire would better account for the educational outcomes of entrepreneurship teaching seen from the European educational policies, while, in line with sociocultural studies, open questions would better examine the meanings attributed by the participants to the experience. Analysis of the banners as products of the group and artefacts representing the shared mental concepts was suggested during the presentation of this project at the CRADLE in October 2012. Such analysis aimed at connecting the

participants' collective agency triggered within the Change Laboratory with the sense of initiative and entrepreneurship.

The multiple choice questions

This part was intended to quantify the educational outcomes of the research. In both contexts, the 7th European key competence of the sense of initiative and entrepreneurship was used as yardstick. The descriptors for knowledge, skills and habits were selected according to the European definition of the competence of the sense of initiative and entrepreneurship (see European Commission, 2007, p. 11), and also from the specific learning outcomes for entrepreneurship education at school in Europe (European Commission, 2012d, p. 19). As the subjects of the research were vocational students the descriptors of this competence dealing with business have not been considered. This choice is supported in the literature by the fact that the socio-economic outcomes for entrepreneurship teaching are not just venture creation, but also employability skills and intrapreneurship (Kozlinska, 2012). The descriptors of the 7th European key competence of the sense of initiative and entrepreneurship employed in the multiple choice questionnaire are shown in the table below.

Table 3-6. Descriptors of knowledge, skills, and attitudes related to the 7th European key competence of the sense of initiative and entrepreneurship used in the multiple choice questionnaire.

7th Key European competence on the sense of initiative and entrepreneurship	
Knowledge	on the services for students in my school; on the professional practices (or work processes) related to the work place; on the job opportunities and constraints at the workplace; on the available job opportunities and constraints after graduation; on the social and moral role of the industry area (how it can be a force for good).
Skills	project work; planning the way the tasks are carried out; problem solving; communicating (new) ideas; negotiating a solution (arranging or settling by discussion and mutual agreement); teamwork (working productively and effectively with others); organizing school and work related activities.
Habits	self-confidence (a feeling of trust in oneself and in his/her own abilities); creativity (generating an idea which is new for the individual); taking the initiative (the ability to initiate or begin something); risk taking; persevering when having problems; resourcefulness; self-management (taking responsibility for their own work and learning); judging and identifying one's own strengths and weaknesses.

Administered to the students only

Overall, the questionnaire is composed of twenty questions, five on knowledge, seven on skills and eight on attitudes related to the 7th European key competence on the sense of initiative and entrepreneurship.

The questions on knowledge investigate to what extent students have information useful to identify available opportunities both in the school and in the workplace. This knowledge concerns: the services for students in the school; the professional practices and work processes in the workplace; the possible job opportunities both in the workplace and after graduation; and the social and moral role of the industry area. Individuals should be aware of the ethical position of their enterprise, and how it can be a force for good. This last question on the values guiding an individual's conduct at work is particularly important from a capabilities approach where the individual turns ideas into action but at the same time creates value for the entire community. On the other hand, the general knowledge about the way the economy works was not put into the questionnaire as it was not directly related to the project.

The skills related to the sense of initiative and entrepreneurship for VET students are those that concern proactive project management: working by projects; planning; problem solving; communicating ideas; negotiating a solution, working in groups; and organizing school and work related activities. Other skills related to the sense of initiative and entrepreneurship have been excluded as business related skills: making a business plan, accounting and estimating. These have been excluded as this study is about entrepreneurship as a social phenomenon rather than venture creation. Thus it concentrates on the employability skills (see Kozlinska, 2012) as entry level outcomes for entrepreneurship education.

The habits connected with the sense of initiative and entrepreneurship used in this research are linked to an entrepreneurial mindset. They are: self-confidence; creativity; initiative taking; risk taking; perseverance; resourcefulness; and self-management. This list is completed by a reflective habit such as the ability to identify and judge one's own strengths and weaknesses.

Each of the twenty questions on the 7th European key competence described above was analysed according to three further dimensions. The first dimension asks the student to what extent s/he thinks s/he has improved over the experience. The possible answers for knowledge and skills were: not at all, a little bit, somewhat, very much, whereas for the

attitudes the descriptors were: less than before, like before (the same), a little bit more, much more. This differentiation between knowledge and skills against habits has been used because while it is relatively easy to change knowledge and skills, changing attitudes takes more effort. For the latter a more fine grained scale is needed to measure smaller changes. Furthermore, for some attitudes such as self-confidence, it was taken into account that the overall experience may even have had a negative effect on some habits. This for example was the case of one student who said that the Change Laboratory workshops had eventually lowered her self-esteem. She had the impression that her contribution had been misjudged as shallow by the teachers. According to Engestrom and Sannino (2010) it is not rare that, when analysing work activity through the mirrors, the subject takes upon him/herself the blame for the disturbances. In this case, the work of the researcher as moderator of the group is to interpret errors made by the individuals as signs of major contradictions regarding the activity system.

For each of the 20 questions on the sense of initiative and entrepreneurship, the second dimension asks the student to quantify his/her level according to an EQF (European Qualification Framework) descriptor appropriate to the level (age and grade) of the student. The EQF is a common European reference framework connecting the qualifications of the Member States and thus working as a translation device (European Commission, 2008). In so doing, it allows the different qualifications across Europe to be more easily understood and compared. There are two aims underlying the EQF: improving European citizens' mobility and facilitating their lifelong learning. The EQF is based on eight levels spanning from basic levels, like the 1st, which stands for school leaving certificates, to the 8th accounting for the most cutting edge form of competence in a sector or branch, such as a doctorate. As a tool for lifelong learning, it includes all qualifications gained in education (general of vocational), academia and training, and encompasses initial as well as continuous education and training. It is based on learning outcomes rather than years of study as the method to compare the diverse European educational systems. The learning outcomes are defined as "a statement of what the learner knows, understands and is able to do on completion of a learning process" (European Commission, 2008, p. 3).

In Italy the diploma in building surveying belongs to technical training and its learning outcomes are comparable to an EQF level 4 (ISFOL, 2012, p. 85). Level 3 is suggested as appropriate for learning outcomes for lower vocational education which is delivered by the

professional institutes, and level 2 for high school Grade 1 and 2, which is comparable to the Australian Years 9 and 10. An EQF level 5 accounts for apprenticeships in post diploma training, just one level below a Bachelors degree. As the Italian students were at the beginning of Grade 5, in this research they were expected to be between EQF levels 3 and 4.

With regards to qualification frameworks, Australia has its own AQF which is based on 10 levels. The AQF and the EQF are similar both in the number of levels and in the competence tested (knowledge and skills). As for the AQF learning outcomes, a level III accounts for a vocational Certificate III, and level IV for a Certificate IV (AQF Council, 2013).

Nevertheless, choosing the European Qualification Framework for both settings allows a better comparison. Since the students chosen for the Australian project were year 11 and 12 VCAL students, it might be expected that their EQF learning outcomes would be a level 3 (work and study under supervision with some autonomy) compared to a level 4 as expected outcomes for the Italian technical diploma in building surveying. In other words, for type of education, the Australian Certificate III can be compared to a three year qualification delivered in Italy by the professional institutes[1].

For Level 3 the European Commission (2008, p. 2) offers the following descriptors: "taking responsibility for completion of task in work of study; and adapting own behaviour to circumstances in problem solving". On the other hand, EQF level 4 descriptors are: "exercising self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervising the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities" (p. 2).

To sum up, the table below shows some examples of descriptors for the EQF levels appropriate for grade and type of vocational education of the participants deployed in the multiple choice questionnaire.

[1] Seen from the Australian point of view, the Italian diploma in building surveying is comparable to an Australian Certificate IV or diploma.

Table 3-7. Examples of descriptors of the EQF levels utilized in the questionnaire for knowledge and skills.

	EQF level	Corresponding descriptor
Knowledge		(Example of question: How specific do you think your knowledge is about the student services provided by your school?).
	2	Basic factual knowledge.
	3	Knowledge of facts, principles, processes and general concepts.
	4	Factual and practical knowledge in broad contexts.
	5	Comprehensive, specialized, factual and practical knowledge.
Skill described according to the level of autonomy		(Example: I can work by projects ...)
	1	under direct supervision in a structured context.
	2	under supervision but doing it with my supervisor.
	3	under supervision but I make some decisions.
	4	on my own.
Skill described according to the capacity to interact actively in a group		(Example: At the moment I can work in a team …)
	2	I participate but I seldom take initiative.
	3	I participate and I take initiative.
	4	I actively participate.
	5	I can lead a group.
Skill described according to the level of complexity		(Example: I can negotiate ...)
	2	to accomplish tasks and solve routine problems.
	3	to accomplish tasks and solve problems applying basic methods.
	4	to generate solutions to specific problems.
	5	to develop creative solutions to abstract problems.

Knowledge descriptors span from EQF level 2 to 5. For skills questions numbers 1, 2, 3 and 7 the EQF levels span from level 1 to level 4; whereas for questions 4, 5, 6 from 2 to 5. There are no EQF descriptors for the habits. In this respect, the Official Journal of the European Union (2008, p. 4) defines competence for the EQF model as “proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development”. This definition excludes the habits in the EQF, which are not described according to the eight levels. The same habits are a foundational part of the concept of European competence for life learning (European Commission, 2007, p. 5): “competences are defined here as a combination of knowledge, skills and attitudes appropriate to the context”. As a matter of fact, habits and values were excluded from the EQF model; for further discussion see (Guillén, Fontrodona, & Rodríguez-Sedano, 2007). As the EQF does not take into account habits, the students were asked to rate the corresponding attitude according to four levels: non-existent, weak, good or excellent.

For each of the 20 questions on the sense of initiative and entrepreneurship, the third and last dimension deals with the importance attributed to the relative knowledge, skill or

habit for the student's professional development, the possible answers being: not important, a little bit, somewhat, very much.

Used as a follow up test, this part of the questionnaire was given to the students only, both in Australia and Italy. However, in Italy a similar questionnaire was also administered to the students, the teachers and the work tutors during the first and second meeting. The teachers and the work tutors had to rate their students' knowledge, skills and habits in relation to sense of initiative and entrepreneurship. The results were used as a mirror material to discuss differences and reasons between the students' self perception and the teachers and work tutors' point of view.

The open questions

The main goal of the open questions was to explore the meaning attributed by the participants to the experience, the workshops, the sense of initiative and entrepreneurship. This part was given to all the participants in the workshops: teachers, work tutors and students.

There are five questions. The first asks the participant to define the sense of initiative and entrepreneurship. The following three questions (number 2, 3 and 4) enquire about the Change Laboratory workshops. The second question asks the respondents what they think they have gained from participation in the workshops. The following two questions (3 and 4) inquire about the pros and the cons of the Change Laboratory according to a SWOT analysis model. This is a structured planning method used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved in a project or in a business venture. The fifth and last question asks the subject how s/he would improve the overall experience. In Italy the students were asked advice on how to improve the work experience. In Australia the students were asked to suggest how to improve the Certificate III in Childcare. The questions are illustrated below.

Table 3-8. The five open questions used in the qualitative part of the questionnaire.

Qualitative questions	
1	What do you think the sense of initiative and entrepreneurship mean?
2	What do you think you have gained from the participation in the Change Laboratory (that is, in the meetings)?
3	What do you think the strengths of the Change Laboratory are?
4	What do you think the weaknesses of the Change Laboratory are?
5	For Italy: In the light of your participation how would you improve work experience at our institute? For Australia: In the light of your participation how would you improve the Certificate III in Childcare at the Catholic College?

Administered to all the participants in the Change Laboratory workshops: students, mentors and teachers.

For each of the questions the participants had from two to four blank lines to write their responses. The answers were then transcribed into a table. Data was then put inductively into categories valid for both the Italian and Australian settings. Since different, the answers for question number five were classified separately according to the context. The outcomes are described separately in the Chapter on the Australian and Italian outcomes of the research, while they have been aggregated in chapter 8 for a comparative analysis.

Due to the larger number of participants and consequently points of view, in Italy the open questions were able to be analysed against the type of participant. Furthermore, the answers to the first question about the sense of initiative and entrepreneurship have been connected with the dimensions characterizing the banner about the sense of initiative in the workplace seen as a shared mental concept. In so doing, coherent with the theoretical framework, the individual and collective dimensions of the 7th European key competence have been considered as interwoven.

4 The Italian Change Laboratory

This chapter describes the Italian part of the research at the technical institute for building surveyors located in a small city not far from Milan, in the Lombardy region. First, to better understand the context of this research, this chapter will provide a historical analysis of how the sense of initiative and entrepreneurship was dealt with in the school before the project began. The chapter will then describe the 'school work alternation' method used for the first time at the institute to implement long work experience, and discuss the meaning of work in the Italian context. Next the chapter will provide an outline of the eight Change Laboratory workshops with the students, teachers and work tutors. In conclusion, the chapter describes the reactions in the school after the project ended.

The Italian research was comprised of two parts. A first initial observation period in January and February 2012 was carried out in the two (by that time Grade IV) classes participating in the project. The second part of the research was characterized by weekly Change Laboratory workshops, and spanned from the end of August to the end of October 2012. During this period, thirteen Grade V students in two surveying classes undertook two months' block work experience. They were divided into four groups and sent to the local government or to private

Questo capitolo descrive la parte italiana della ricerca effettuata presso un Istituto Tecnico per Geometri situato in una città lombarda non lontana da Milano. Per meglio comprendere il contesto della ricerca si inizia con un'analisi storica di come il senso d'iniziativa e d'imprenditorialità veniva approcciato nella scuola prima dell'inizio del progetto, e si continua con una descrizione del modello dell'alternanza scuola lavoro utilizzato per la prima volta per implementare lunghi periodi di stage, discutendo poi il significato del lavoro nel contesto italiano. Il capitolo fornisce una descrizione degli otto Change Laboratory con gli studenti, gli insegnati ed i tutor aziendali, e termina con le reazioni nell'Istituto dopo la fine del progetto.

La parte italiana della ricerca è composta da due momenti. La prima è un periodo di osservazione in gennaio e febbraio 2012 nelle due classi (quarte al tempo) coinvolte nel progetto. La seconda è costituita dai Change Laboratory a cadenza settimanale da fine agosto a fine ottobre 2012 abbinati ad un percorso di stage per i tredici studenti (a quel tempo di classe quinta) che, divisi in quattro gruppi, sono stati inviati presso gli uffici della Provincia locale o presso

builders.

In the public sector, three students went to the local government 'streets sector', while another three went to 'buildings maintenance'. Both offices were located in the city centre. In the private sector, four students undertook work experience at a local small construction cooperative and another four went to a private constructor. The relevant headquarters were located in the suburbs. Both in the public and private sector, the building sites where students were learning were scattered around Lombardy, Emilia Romagna and Veneto. This did not represent a problem, as students were able to travel by car with their mentors. These employers were found by the two construction teachers of the classes involved in the research thanks to their relationships with the local building companies[1].

costruttori privati.

Le aziende sono state individuate dai due insegnanti di costruzioni delle classi coinvolte nel progetto grazie alle loro relazioni con i costruttori locali[1]: tre studenti sono stati inviati presso la Provincia nel settore mantenimento strade, mentre altri tre nel settore edifici pubblici. Entrambi questi uffici erano situati nel centro città. Nel settore privato quattro studenti sono stati inviati ad una cooperativa di costruzioni mentre altri tre da un costruttore privato. In questi ultimi due casi le sedi erano situate nella periferia. Sia nel settore casi pubblico che in quello privato, i siti delle costruzioni erano sparsi tra Emilia, Lombardia e Veneto. La mobilità non ha tuttavia rappresentato un problema dal momento che gli studenti viaggiavano con i rispettivi tutor aziendali.

4.1 Historical premises: how was the sense of initiative and entrepreneurship taught before the beginning of the project?

In the third generation of CHAT problems and potentials of an activity system must be understood against their own history (Engestrom, 2001a). The Change Laboratory and the research outcomes are better contextualized and understood when compared against the way the sense of initiative and entrepreneurship was taught before the beginning of the research. This competence is maximized when school and companies have strong connections (European Commission, 2009). During observant participation the researcher noted three ways in which the school and its students connected with local enterprises:

[1] At the beginning four different private employers were found, but two of them withdrew just few weeks before the beginning of work experience because of the crisis in the building sector. The local government came then as second choice.

short work experience; school visits to the building sites; and technical teachers also working for the local building companies and design studios.

At the end of the 1990s technical and professional institutes in Italy realized the importance of having students undertake work experience; since then a compulsory two weeks' block work experience has been mandatory during Grade IV. The student has to search for their employer, and by so doing s/he is proactive. As many students live in the countryside, they generally find a workplace close to their place and thus end up being scattered around the province. Since the school is located in the city centre it is difficult for teachers to travel far from school and visit the various employers to check what the students are working on. Hence it is impossible to verify to what extent each work placement is a suitable learning experience. In the institute, which has roughly 500 students, there is only one teacher in charge of work experience. S/he carries out the relevant paper work. Since the policy reforms of the late 1990s aimed at giving schools more autonomy (see Ajello, Chiorrini, & Ghione, 2005), every teacher is paid for 18 teaching hours weekly which must be spent in class. Moreover, because of the spending cuts made in recent years by the government there is no extra wage for other activities or funds devoted to professionals other than teachers. Generally speaking, because of the need for workshops and various types of equipment, technical institutes are far more complicated and expensive organizations to run than lyceums, where the main teaching method is through lectures. Nonetheless all schools are funded at the same level. It is possible to imagine the detrimental impact this had on the technical institutes and how discouraging it is for the personnel.

From the researcher's information obtained during field research, the students do not consider two weeks' work experience to be enough, as they think they could become more competent by working than sitting in the classroom. Indeed, students believe that school does not provide adequate preparation for their future jobs. It is also felt that, as students at technical institutes are considered more 'hands-on' learners, they would benefit more from experiential learning in the workplace.

When the teachers were interviewed on the history of work experience in the school, they told a story about two students working for the local city council who had to spend the entire day in a cemetery to measure the size of a gravestone. This story was known by

most of the people in the school, and was used as example of what work experience should not be like.

In the two weeks' work experience students do as part of their study, students[2] generally find a design studio as employer and learn the specific designing software for surveyors. Since youth seem to be good at picking up IT skills, students are often asked to transcribe blueprints from paper to computer. Although this is not very educational as it is concerned with training[3], the student feels s/he is working like a real surveyor. During work experience youth also go to the building sites and take measurements, another important skill for surveyors. However, surveyor related competencies take time to be developed. In this regard, teachers argue that short work experience is more for orientation purposes than competence acquisition.

In relation to ties between the school and the local enterprises, it is common for the teachers of subjects like topography, constructions and technical design to work privately for the local companies[4]. Unfortunately, these connections only have a limited impact on curriculum and teaching style. The curriculum is imposed by the Ministry of Education, and there are not many opportunities to tailor it to the local enterprises. Additionally, the curriculum is so vast that the teachers have literally 'to chase it', and the lessons end up being based solely on lectures. When during observant participation the researcher went to the school workshop together with the class, he observed the teachers delivering lectures even there. Entrepreneurship is not an explicit goal of the curriculum in surveying. Students seldom work by projects or in team, and they are infrequently confronted with real surveying related problems. Students' initiative and autonomy were rarely encouraged in the class.

The cooperation between teachers and companies may be observed in the visits to the building sites organized on a regular basis. However, such visits are difficult to implement: the class (made up of 25 students) tends to block work activity in the working sites, which are ultimately businesses and are profit driven. It is also difficult to arrange protective

[2] Although still considered a male profession, nowadays in Italy there are increasing numbers of girls studying surveying. However, more female students would be needed to address the skill shortage of technicians (Palma, 2012). In this research, there were 4 girls out of 13 students.

[3] According to Winch (2013) training is concerned with the repetition of activities so as they can be performed in a competent and confident way.

[4] The Italian teacher's salary is lower compared with the European average, and the profession is considered unattractive. Sometimes teachers choose teaching as challenge, or to secure a stable income.

helmets and shoes for the youth and to have them climbing scaffolding or taking measurements. Moreover, some students are not interested and they do not take the visit seriously.

During field research the researcher could also observe the students' different attitudes toward this project and the proposals they were asked to make showing their interest in undertaking two months' work experience. Some were keen to start working instead of going to school and did their best in their subjects throughout Grade IV to be chosen. For others this project appeared useless as they wanted to continue studying after graduation and there was no reason to do hands on work and undertake unpaid work. Others did not see the learning potential in work placement and said they would work only if paid.

Long work experience was implemented for the first time at the school through the so called school work alternation. This is a formative tool introduced in Italy in 2005 allowing students aged 15 to 18 to leave school and learn the same competencies in the workplace[5]. It is one of the means by which the Italian regulators aim to combat youth unemployment and the mismatch between school learning outcomes and the skills required by industry (Ugolini, 2012).

4.2 Outline of the Change Laboratory workshops

This section will summarise each of the eight weekly Change Laboratory workshops held at the institute for building surveyors from September 1 to October 25, 2012. Thirteen students, four work tutors[6] and three teachers (one of them also being the school vice principal) took part in the workshops on a regular basis. Other work tutors, teachers and the school principal occasionally participated as well.

In addition to describing the main activities in each workshop, this chapter will also present some of the materials used during the meetings, such as pictures, charts, diagrams and presentations. The description may be helpful in permitting the project to be repeated

[5] See decreto legislativo 15 aprile 2005, n.77.

[6] As it was difficult for the mentors to stop their work to attend, it was agreed that they would alternate their participation, with only two of them being present at one time. However, they would sometimes visit even when they were not scheduled to. This resulted in a great mentor participation in the workshops, and their interest can be taken as an indicator of the success of the experience.

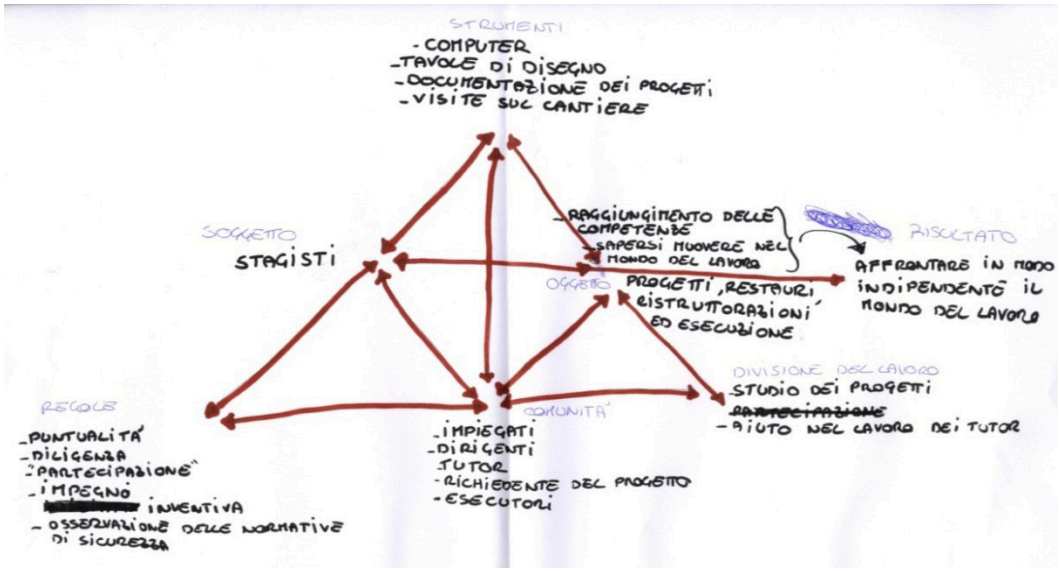
in other contexts and in allowing the reader to better understand the nature of the Change Laboratory. It also serves to point out the massive field research necessary to gather the mirror materials useful to trigger dialectics within the workshops.

First workshop

The students, the researcher and the school principal participated in the first meeting. It was the only workshop which took place on a Saturday. It was an introductory meeting: the school principal welcomed the students and explained rules and practical details, for example how to get refunds for meals and bus tickets. The students talked about the goal of the Change Laboratory that is discussing (and possibly solving) the problems students would be faced with during their work experience, thus triggering their sense of initiative and entrepreneurship. The students filled out a short questionnaire on this competence which was used two weeks later as mirror material.

The triangle of Engestrom (1987, p. 87) was used as an example of a tool to analyse work activity in both work and school settings. The school was used as an example of an activity system, thus showing the object, outcomes, mediating tools, division of labour, rules and community of this activity. Following this the students were asked to work in groups to think about their workplaces in term of the Engestrom triangle. By then they had already been at work for one week so they already had the knowledge of their workplace needed to complete the triangle. One of the four posters made by the students is presented below as example.

Figure 4-1. Example of students' group work. Representation of their workplace in terms of the Engestrom triangle.



The students drawing the schema above were doing their work experience at the local government, in the sector of public buildings maintenance. At the top there are the instruments and signs in the workplace: the computer, the drawing table, the project documentation and the visits to building sites[7]. The subjects are the students undertaking work experience. In the bottom left part there are the rules: being on time, diligent, involved, creative, observance of the security norms and actively participating in the activities. In the bottom middle there is the community: clerks, managers, mentor, customer and executors. In the bottom right there is the division of labour: studying the projects and assisting the mentor. The object of the activity is twofold (in the middle left). Above the arrow is the object, seen as sense making: achieving competencies; being able to tackle the world of work. As a result, the student can cope autonomously with the world of work. Below the arrow, the students put the object, seen as "raw material"[8]: projects, refurbishments, renovations of historical buildings. The outcome, which could be seen as sense making, is to cope autonomously with working life.

[7] The students also put the visits to the building sites in the area for signs and tools. This is interesting as it shows their awareness that the visits are mediators for learning (the object of the activity seen by them).

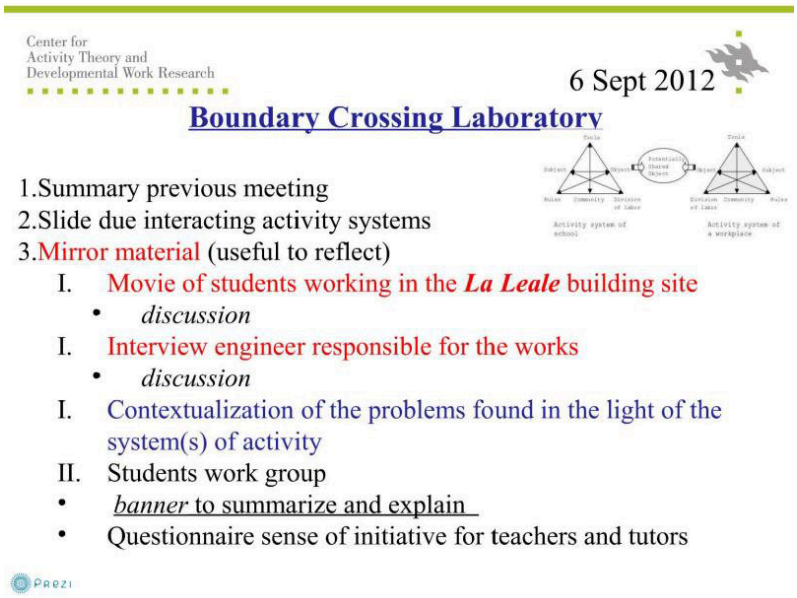
[8] Being an application of activity theory, the theory of expansive learning is an object-oriented theory: the object is both resistant raw material and the future-oriented purpose of an activity. The object is the true carrier of the motive of the activity (Engestrom & Sannino, 2010, p. 5).

Second workshop

This meeting was held on a Thursday, as were the following meetings. From this workshop on, the participants were the students, the two construction teachers, the school vice principal, two or more work tutors and the researcher.

The work tutors and teachers were asked to complete a questionnaire on the sense of initiative. Next, the researcher showed a possible plan of the lesson prepared earlier, which can be seen below translated into English.

Figure 4-2. 2nd meeting. Schedule of the workshop.



The researcher also explained briefly how school and the workplace could be considered as two interacting activity systems with different rules, tools, objects, division of labour and community, but possibly a common shared object - the student's learning (see Konkola, Tuomi-Gröhn, Lambert, & Ludvigsen, 2007).

Before the beginning of the meeting a group of students was having a problem in their workplace. Hence, one of them was encouraged by the researcher to talk about it during the workshop. It seemed that their mentor had left the students unattended for few days and in the meantime had not left any tasks to be performed. The teachers and the work tutors present agreed that it was up to the students to show initiative in the workplace. They suggested that the students ask the mentors' colleagues what they could do before the mentors' return. Regarding initiative, a mentor said he was impressed by his students'

readiness to absorb (i.e. to learn) and show initiative, as when they finished a task they asked immediately what was next.

Next, two recordings taken the day before during a visit at a building site were shown as mirror material. In the recordings the newly arrived students were taking measurements of the building under construction, as illustrated in the picture below.

Figure 4-3. 2nd meeting, mirror material. Students taking measurements in a building under construction.

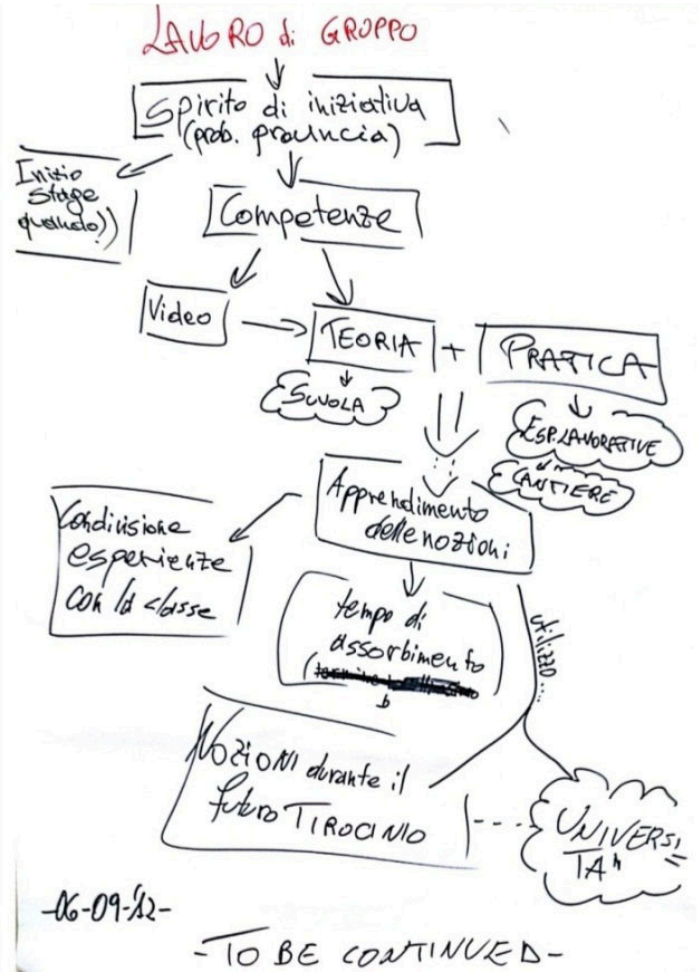
The two work tutors were on the left, while the four students were in the centre. A (female) student is directing her classmates (closer to the windows). The mentors' supervision appeared attentive; for example the mentors asked questions such as "what do you measure next?" It was apparent that the students were not able to work autonomously. This is perhaps unsurprising as it was their first measurement in a real construction area. The work tutors also took charge of explaining the meaning of the actions undertaken, that is, why a measure has to be taken in a certain way and how it fits with the bigger picture – the blueprint. It was clear that the two supervisors could have been much more brief in their explanations; nevertheless they took the time to explain at length, indicating that this training was an important investment for the company.

After having seen the movie a technical teacher reassured the students that many of the contents and proficiency necessary at the workplace are dealt with during Grade V, so students were not to be blamed if they lacked some knowledge or skills. Moreover, it was normal that students are a bit clumsy at the workplace as it was their first time. The discussion moved on to how to use the competencies gained during this work experience. A technical teacher said that his students would be asked to deliver presentations and discussion during the school lessons, and also suggested that they prepare a report of the activities as a project for the graduation exam at the end of that year.

In the second video the engineer responsible for the building that the second video was filmed in was interviewed about issues connected to having students working and learning in the workplace. In the interview the engineer expressed concern about the preparedness of the students, as it was clear that they lacked basic skills in topography. This issue of lack of competence did not trigger further discussion as it had been previously discussed. It was also stressed that the students themselves made the decision to participate in this project. The teachers encouraged them to 'have a go', to ask questions and to show initiative to their work tutors to get the most from this unique experience.

In the last part of the session the students were asked to summarize the discussion in a form of banner which is shown below.

Figure 4-4. 2nd meeting. Group work made by the students.



Italy (n=13)

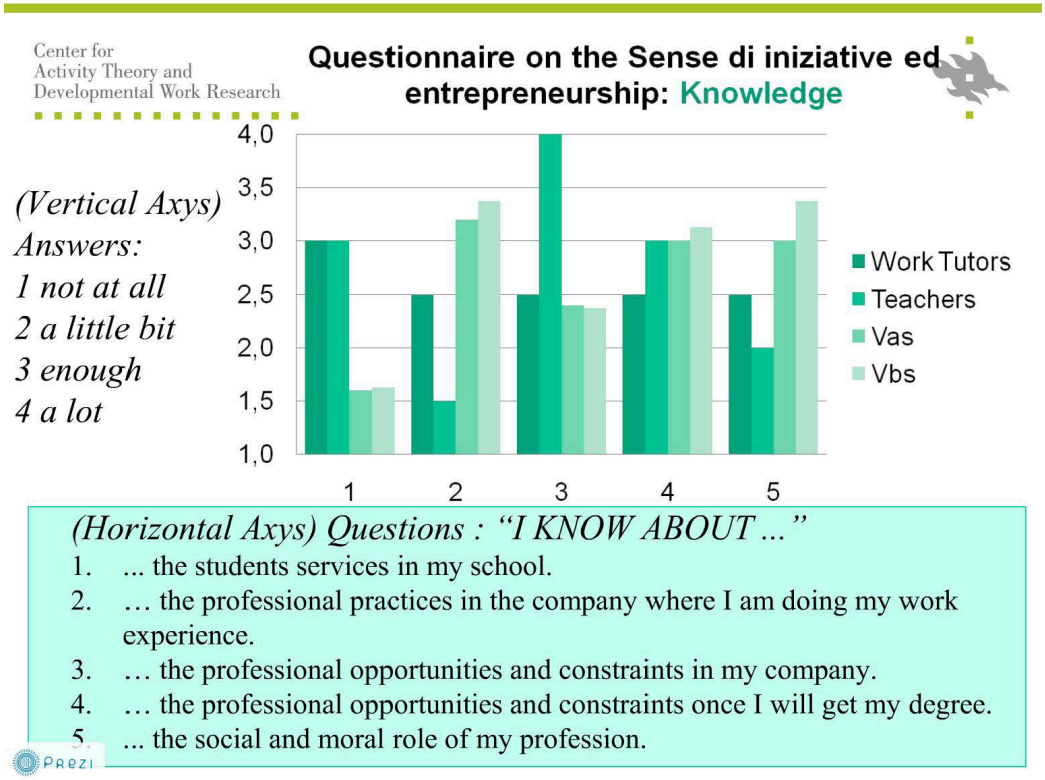
The sense of initiative is represented in the form of 'spirit of initiative' (the first black frame on the top). The students report that competencies are made of theory (provided by

the school) plus practice (provided by the experiences in the workplace, especially in the building site). Theory and practice taken together make it possible to learn content. Such learning depends on 'the absorption time' and the sharing of the experience with the rest of the class (during the workshops). It was expected to be useful after the diploma either for the year' supervised practice[9] or for university.

Third workshop

A good part of the session was spent discussing the results of the questionnaires on the sense of initiative given to the students, the work tutors and the teachers in the 1st and 2nd meeting. These mirror materials were shown to the group in the form of charts. The picture below represents the figures obtained in relation to the 'knowledge' competency.

Figure 4-5. 3rd meeting, mirror material. Entry questionnaire on the sense of initiative and entrepreneurship, figures for knowledge.



The chart illustrates the answers to questions concerning knowledge connected to the competence of the sense of initiative and entrepreneurship. The five questions are presented at the bottom of the chart, and start with "I know about". The possible answers to the questions are on the middle left, and span from 'not at all' to 'a lot'. The

[9] necessary to become a licensed surveyor.

questionnaire was administered to the students as a self-evaluation exercise. At the same time, it was given to work-tutors and teachers to rate their students. Answers were divided into four groups: the students of Va, the students of Vb, the work tutors and the teachers. Possible differences in perception of knowledge related to this competence were used as mirror materials for discussion. Another two charts similar to the above one were displayed for the skills and the habits related to the sense of initiative.

A number of important ideas emerged during discussion when looking at the same object. The students' competence (knowledge plus skills and habits) on the sense of initiative and entrepreneurship may be seen from four points of view of comparison. First, students claimed they did not know about the student services in their school because they thought there were none, while teachers and work tutors thought students should know the few services available. Secondly, students thought they knew about the professional practices in their workplaces after only two weeks' work, while their teachers and tutors did not think so. Thirdly, some students evaluated their competencies less favourably than their teachers or work tutors did. For example, when the chart of the skills was discussed, teachers rated students' self- organization higher than students did. Fourthly, the students of the class Vb evaluated their performances better than their counterparts in Va. During discussion the difference appeared to be connected with the practice of self-evaluation in class Vb. The construction teacher, after an oral examination, asks the student to evaluate their performance and give reasons for it. In so doing the student understands the reasons for their mark and thus is able to better self-evaluate their performance.

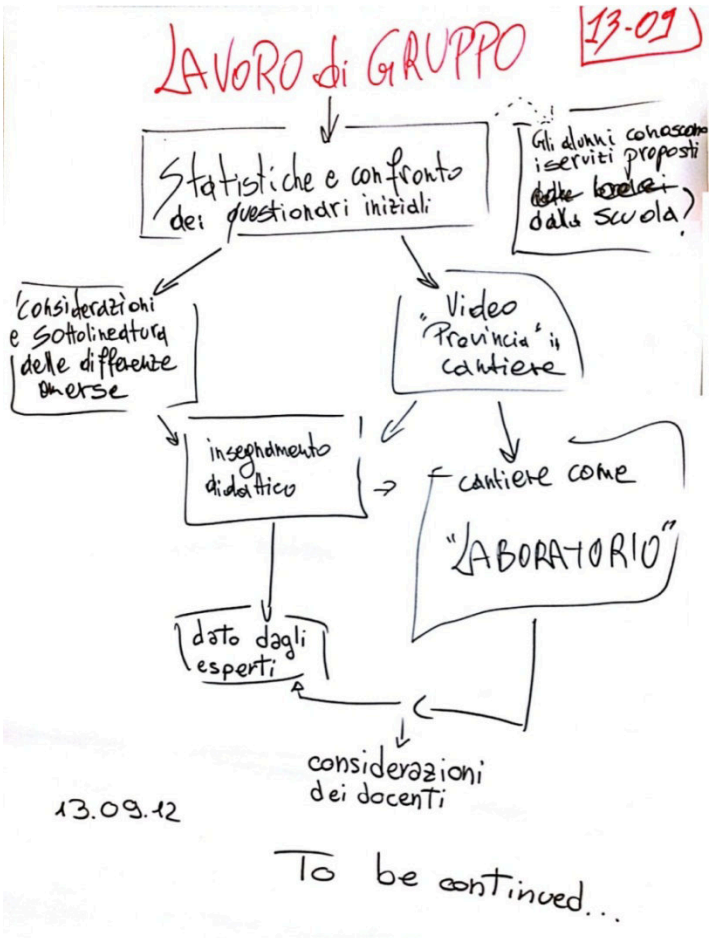
Next, the video of the group of students working at the local government, buildings maintenance sector was projected as mirror material. The youth actively assisted while their tutor negotiated with a sub-contractor about the progress. The building site in this instance was the ceiling of a historical building (depicted below).

Figure 4-6. 3rd meeting, mirror material. Work tutor negotiating the progress the subcontractors, the students assisting.

The group had the discussion on top of the scaffolding (in a rather uncomfortable position), five meters above the level of the ground. The work tutor is on the far left wearing a blue shirt. The students are in the centre, two (female) sitting and one (male) standing. The students are listening and taking notes. Before this activity their tutor had shown them around all the building and explained the state of the works, what had been done, why, and what this implied.

The following discussion stressed the value of visits to construction sites for the students' learning. For their learning potential, these were defined by a teacher as "workshops that have to be experienced in first person", and cannot be described in class or seen in a video. At the end of the meeting the students were asked to summarize the lesson in the form of a schema (in the picture below).

Figure 4-7. 3rd meeting. Group work made by the students.



ITALY (N=13).

In this banner the students identified the analysis of the charts on entrepreneurship and the discussion of the videos. The visits to the building sites were described as "leaning workshops". Such visits were contrasted with "didactic teaching" which "is given by the experts", presumably teachers.

Fourth workshop

An interesting question that emerged in this discussion was whether a person observing within the building site is part of the community or not. The students and work tutors agreed that the students are actively participating in the community even when they are simply observing. On the other hand, a person observing from the outside would not be considered part of the building site activity. Together with the Engestrom triangle, the theory of legitimate peripheral participation[10] was suggested to the students as a way

[10] Following the theory of Lave and Wenger (1991).

of explaining their activity in the building sites. At the beginning their contribution would be only marginal, as they were just observing, but after some time they would actively contribute to the work. One work tutor liked Lave and Wenger's theory, and talked about "student's progressive insertion in the company's life".

Next, an interview was projected as a mirror material. This was taken a few months before during observant participation, and enquired about the two weeks' work experience which is normally carried out during Grade IV. In that video, which was named 'like a real surveyor', a student was asked to describe his work experience in a design studio and the meaning he gave to what he had learned. The student reported that he had learned more in two weeks than in an entire school year, as he was asked to carry out tasks likes a real surveyor. As a consequence, he complained about the theoretical knowledge he was taught at school, which he said was not suitable to be used in the workplace[11].

The group, especially the work tutors, collectively disagreed with the views expressed in the interview: school did give students the necessary foundations, allowing them to master the tasks they were given in the workplace. The role of the school is to "give the basics" and to teach students "a model of reasoning".

Another topic discussed was whether it was better to work in group or individually. On the one hand working as a group is better as discussion among the participants improves comprehension on the issue being dealt with. On the other hand, when in group work, tasks are sometimes split and the individual only learns about what s/he is doing.

Next an interview with the school principal was shown as mirror material. In the video, the principal was asked to discuss how she envisioned work experience in the technical institute. However, she ended up describing the difference she thinks there is between training and drilling: training is about teaching for competence and attitudes useful throughout life, while drilling is about teaching a concrete skill solely for the specific work context, as could be the case of payroll software for accountants[12]. This should be learned in the workplace, as software continuously changes and there would be no point in the school teaching it. She cited Morin's book called *La Tête bien faite* (1999), that is the well

[11] This video was selected as the student was critical of school teaching. This was expected to trigger discussion.

[12] This example is not related to surveying, but came to her mind as in her previous job she was teaching in a technical institute for accountants.

formed mind, and said that the school has to shape the student's mind, so that they can learn quickly how to master specific tools in the company. Sometimes she had bumped into employers complaining about the lack of her students' specific skills. However, the employers changed their mind as soon as they saw how quickly the students with the 'well formed mind' could learn how to use specific software.

At the end of this workshop one construction teacher told the researcher he was happy about the meetings. It seemed important to him that the students could share and reflect on their experiences through videos and discussions. In addition, the students were participating more and more in the meetings, thus showing more initiative.

Fifth workshop

This was held on September 29. One teacher started the discussion by saying that his colleagues were concerned about the curriculum. He was upset, as he had just discovered that his colleagues had been going on with the curriculum with the students that were not taking part in the project. The 13 students participating in the project started work experience two weeks before the beginning of the school term and worked for two months. The other class students started the lessons regularly and undertook only two weeks' work experience. As a result, the other students were in the classroom one month more than their schoolmates participating in the project.

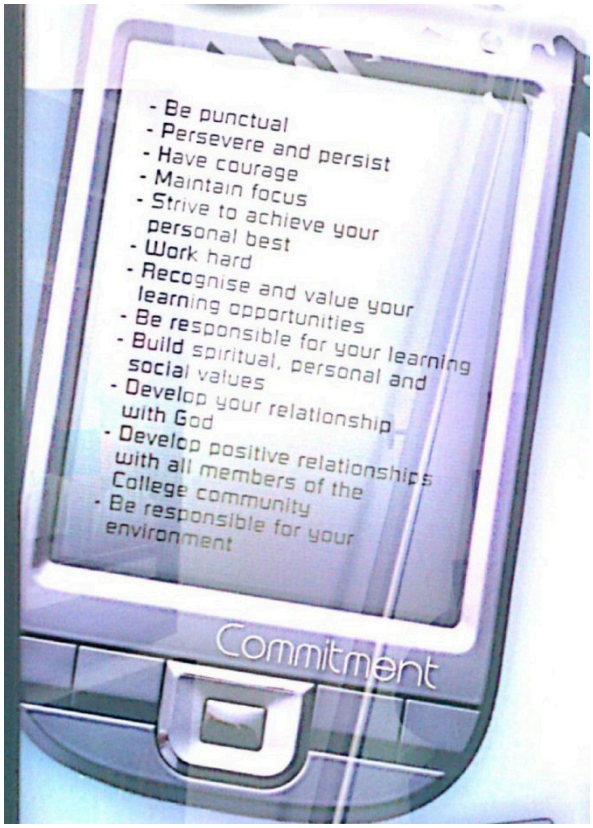
When the project was presented, students were told that the rest of their classes would not continue with the program of Grade V but just sum up the topics of Grade IV. Instead, teachers had accelerated the curriculum. This was partially due to the earthquakes the previous year which had caused the school to close two weeks before the regular end of term. In addition to this, the teachers and students participating in the project felt that because not all teachers had been involved in the project they did not give any weight to the project. Students were afraid that at the graduation exam they would be asked questions on topics taught during their absence.

The teachers suggested that the students see this project as a positive, and to base the graduation exam on this experience with presentations and reports so that nobody could ignore their work experience, and not be preoccupied with what the rest of the classes was doing. The teachers suggested that the students show initiative in the workplaces to get as much as possible from this experience.

However, a work tutor argued that initiative in a workplace requires technical competencies and autonomy of thinking: school does not help students become autonomous and set deadlines on their own. A teacher countered this assertion by arguing that autonomy is a trait of personality and a student can also be autonomous at school if s/he wants to. For example, s/he could organize their school related activities and learn how to match deadlines without being overwhelmed at the end. The tutor suggested that initiative is a consequence of the interest that the student has in the subject matter. Another tutor suggested that when a student has a problem he or she goes to their work tutor not only with the problem but also with a proposal for a solution.

To reinforce the concepts related to the sense of initiative discussed above (autonomy, self-organization and initiative) a banner found at the Catholic college where the Australian research was conducted was shown as stimulus (see below).

Figure 4-8. 5th meeting, mirror material. "The sense of initiative in the Australian school".



The discussion following the mirror material reinforced the concepts characterizing the sense of initiative we had discussed before: perseverance, commitment, responsibility. At

the end of the workshop the students were asked to sum up the main topic of the workshop, and produce a banner on the sense of initiative and entrepreneurship. Because of its importance the banner is described in the results chapter.

Sixth workshop

This meeting started with a summary of the previous lesson. The conversation then moved to the class lessons the students participating in the project were missing. For a tutor this was a baseless concern, as his students were learning how to be competent in the field, and this was much more than what they could get in the class. The humanities teacher/vice principal pointed out that the other students in the classes were also complaining as the school program had been delayed and shrunk because of the students participating in the project. Consequently, they were also afraid they would not be ready for the graduation exam. According to the humanities teacher/vice principal, the students attending the regular lessons were becoming resentful toward their counterparts.

Next, the outcomes of the teachers' board meeting held the day before was projected as mirror material. In that board meeting some teachers expressed their doubts about the project[13]. Some argued that the real school work alternation would be one week at school and one at work, whereas others claimed that the students should be alternated so as to give each of them the opportunity to undertake work experience. It was evident during the following discussion that none of these ideas was realistic.

The group moved to discuss the future of long work experience: it could be moved to another period of the school year, for example during the end of Grade IV or even summer holidays. According to the humanities teacher/vice principal, long work experience should be made available for everybody who wants to undertake it. However, it is difficult to propose long work experience for the whole class, because not all the students would be willing to participate. Some of the youth believe there is no point in working if they want to enrol in a university course afterwards. Others have to make up subjects during summer, and some look for paid employment.

Going back to the present problems of the project, in relation to the fact the teachers were going on with the curriculum in the classes, it was decided to invite more teachers to the meetings so that they could get more involved in the project. However, it was felt that

[13] These are the same teachers who seem to resist to each initiative coming from the school principal.

no teacher would come as they were not paid to participate, and as the meetings were in the afternoon no teacher would come just for this.

The discussion returned to the students missing class lessons because of work experience. The idea of a personalized program for the students taking part in the project was suggested. On one hand, this meant that they would not be tested on the topics the other students had covered in their absence and that they had already learned during work experience. On the other hand, their experience would be shown during the teachers' lectures, in the form of discussions and presentations. The students would also prepare a report and a portfolio of the main projects they followed during their work placement, and this would be proof of their different pathway at the graduation exam. A last idea suggested an 'open class board'[14] to be held in November where the students could introduce their work experience to all teachers.

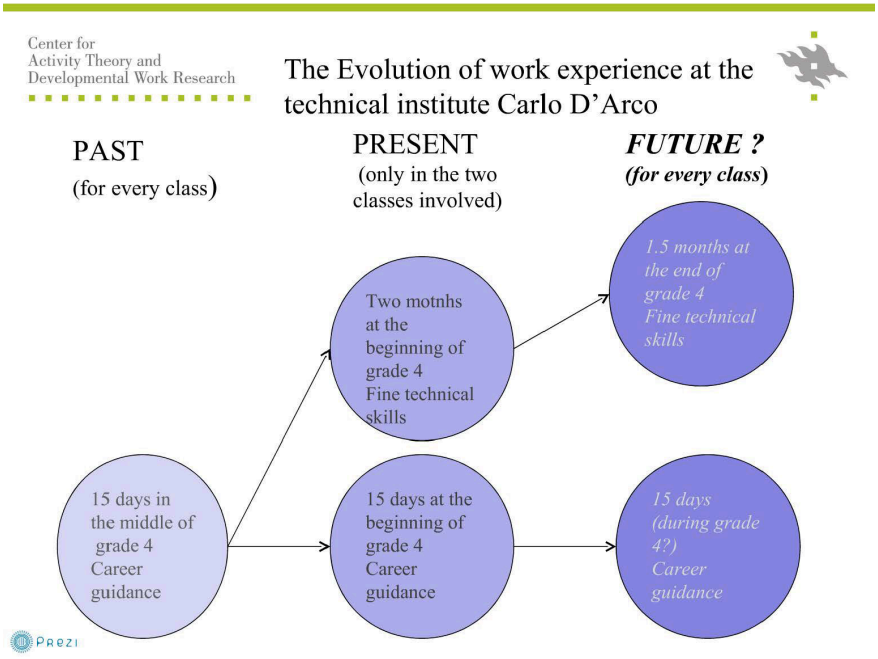
Before finishing the meeting, the students made a decision on what to do on the following Thursday, when the researcher was not going to be present. After having explored different choices such as make up lessons delivered by the teachers or the students, it was decided that the students would go to their workplace.

Seventh workshop

This took place on October 18. Two teachers from the logistics course and the school principal were present in addition to the regular attendants. The topic of the discussion was how to continue the long work experience plus Change Laboratory workshops in the future, and extend it to other classes. As mirror material a representation of the evolution of work experience at the school was shown. The diagram can be seen below.

[14] In Italy the teachers of a class meet periodically. Some boards are 'open' as anybody can participate: students parents, etcetera.

Figure 4-9. 7th meeting, mirror material. Diagram representing the historical evolution of work experience at the school.



During the design of this diagram, the researcher gave thought to how to integrate the different ideas discussed over the previous workshops[15], the aim being to help the group envision the future of work experience[16] and start generating a new model of activity system. On the left side there is 'short work experience' as it used to be for the last 15 years, only two weeks in the middle of Grade V. In the middle there is 'the present' with two types of work placement: for the students participating in the project there is 'long work experience' which is two months' long; for the other students there is short work experience. On the right side of the model there is 'the future': long work experience (this time a month and a half long) and short work experience could be undertaken at the end of Grade IV. One last note concerns the aim of work experience: while the short one is directed at career guidance, the long one would also be aimed at gaining fine technical skills useful in obtaining a job post-graduation.

However, this graph does not grasp other important issues as yet undiscussed. How many students should undertake long work experience, all the class or just a part of it? In

[15] Creating a diagram is useful as it helps conceptualize (Engestrom, 1994). Of course the participants, as consequence of double stimulation (Engestrom, 2011), may go beyond and create their own model.

[16] Modelling and envisioning are two epistemic actions during expansive learning (Engestrom & Sannino, 2010).

this case who should undertake which work experience: better performing students or students who could benefit more from work based learning? What would the students 'waiting in the class' do in the meanwhile?

Nevertheless, the discussion on the future of work experience at the school seemed to be progressing, demonstrated by the schema above. A work tutor proposed to move long work experience to the end of the school year in Grade V to avoid superimposing school and work. This would pose other problems. Students who fail subjects have to make them up therefore could not take advantage of work experience. Vice versa, students who pass all the subjects would like to enjoy the summer holidays or find a temporary paid job often not related to their field. Furthermore, according to the Italian regulations, 'school work alternation' is meant to substitute the class lessons, not to be a supplement. Another idea came from a few work tutors and students, and was about shortening work experience to six or even four weeks. However, in four weeks of work one would not learn as much, the students said. The group agreed on six weeks starting in mid-August, so as not to miss too many lessons and start school at the beginning of October.

A further topic on the future of work experience was who to involve, either the best performing students or everybody, and how many classes of the institute. Long work experience could also be good for students who failed their subjects or lacked motivation. A teacher said this would be nice in theory but difficult to put into practice. For him, the best period to undertake long work experience would be the end of Grade IV. However by that time students who are failing subjects have to make up their subjects, and therefore could not take part in it.

A last proposal was to organize school visits in the construction sites for all the students of the class once a month over the school year. It was argued that for many youth school visits are not seen as a learning experience. Instead students joke and do not take it seriously. Talking about the building sites and their learning potential, a teacher pointed out how impressed he was during a visit with the researcher to a building site close to Milan. Without being asked to do so, the students had prepared a Power Point on the activities they had carried out.

During the workshop the teacher emphasised how he had been impressed[17] by the level of mastery displayed by these students during the Power Point presentation: for example, they showed that they were able to carry out metrical computations autonomously. The teacher was also amazed by the relationship he had observed between the work tutors and the students. It involved more than just a transmission of content: it was an "educational relationship" that had needed time to be built up. One month of work experience would certainly not be enough to build such a relationship.

Following the group was shown a recording of this presentation (see picture below).

Figure 4-10. 7th meeting. The video of the presentation of the students at the building sites of Milan being projected as mirror material during the Change Laboratory.

The students' Power Point presentation in the building site was particularly important as it shows initiative from the students. Not only was this video shown to the rest of the group as example, but it was suggested the students deliver a similar presentation in the forthcoming open teachers' board, so as to show the teachers the impressive level of autonomy and competence the students had gained over the work experience.

At the end of the workshops as proof of their participation in the Change Laboratory, the students were divided into two groups and asked to create a schema of the ideal work experience: contents, duration, participants, etcetera. These are described in the following chapter on the Italian results.

[17] As the teachers involved in the research will identify in the questionnaire, the entire project uncovered unexpected students' capacities: initiative, autonomy, responsibility.

Eighth workshop

This last Change Laboratory was held on October 25th, and was used to complete the final questionnaires and to decide the wording of the participation certificates for the project.

After the session a technical teacher shared his concerns with the researcher about the conflict expected to rise between students in his class. The return into the class of the students who took part in the project was anticipated to be difficult. The students who had not participated appeared to be resentful as they felt the delays in the curriculum would hamper their preparation for the graduation exam at the end of the year. The teacher asked for the contribution of the researcher in the class as psychologist. Unfortunately, this was not possible as he was leaving for Australia to continue the research.

Reactions in the school after the project

One month after the end of the workshops the researcher sent an email to the three teachers who took part in the meetings, and enquired about the thirteen students who had participated in the project. The opinions were twofold: while two (male) construction teachers were optimistic, the third (female) humanities teacher/vice principal had conflicting feelings.

On the one hand, from the construction teachers' point of view, in both classes the return to school was not as traumatic as expected for the students who participated in the project. Although at the beginning they were perceived as "external bodies", after a few days this sensation faded away. The same was true of their schoolmates' resentfulness. For a few students it was more difficult to make up the subjects they had lost during work experience, but this was due to the gaps in their education previously accumulated during Grade IV.

The presentations held at the open class board in November were excellent. The teachers were particularly impressed by some of the students who presented, as they were normally "a bit clumsy", while this time they had been "clear and positive". This presentation was reported to have convinced the most sceptical teachers about the importance of the project. Eventually, the two male teachers, with the support of the school principal, were thinking about organizing a ceremony to award the students with a certificate of participation.

On the other hand, for the humanities teacher/vice principal it took a week to respond to the researcher as she wanted to discuss with her students the outcomes of the project. From the students' point of view their return to school was rather hard for two reasons. First, some teachers had already begun teaching new topics. However, they thought they would make them up over the Christmas holidays. The second reason is more difficult to overcome, especially in the humanities teacher/vice principal's class, as those who did not participate in the experience blamed their classmates for the fact that they would not be ready for the graduation exam at the end of the year. This was because of the program reduction, delays and less time for drilling and exercising. The atmosphere in that class was already tense when the students were doing work experience. A few weeks after they re-joined the class the atmosphere had improved, but there was still some anger.

With regard to the teachers, students said some were helpful and understanding, while others did not completely understand the situation. The humanities teacher/vice principal reported that during the open class board in November the Power Points delivered by the students on their work experience were rather short and general, given their "limited dialectical abilities". The other teachers were listening and wondering if and how a similar experience might be proposed again in the coming years. All in all, the students believed it would be useful to have a similar model of work experience repeated.

The school principal was another important source of information to understand a different aspect of the meaning of the project. Overall, she was enthusiastic. She understood that the workplace turned out to be an essential place to develop the students' competencies, especially the key competencies for lifelong learning. Consequently, she would like to extend long work experience through school work alternation to every Grade V class at her school, including the technical courses in graphic design and logistics, where there are local enterprises willing to take students on for long work experience. She is also aware that the Italian Ministry of Education is pushing for school work alternation to improve the quality of education and the students' employability. The school principal was also impressed by the Change Laboratory itself. It was seen as an excellent formative experience for all the participants: for example, she was told by the teachers of their amazement when they saw videos of students undertaking work experience used as training material. Also the idea of having representatives from local businesses, the teachers and students sitting together and discussing solutions to problems was of particular interest to her.

Three months after the end of the project everybody in the school agreed that the results of the project had been positive. On February 19, 2013 the researcher delivered a video conference presentation on the results of the research, with the work tutors, the local press and the school principal present. The students taking part in the project were awarded with a certificate of participation. According to the teachers, the youth undertaking work experience integrated well with the rest of the class who had ultimately reacted positively. The teachers' body better understood the importance of the experience. At the graduation exam the teachers would introduce appropriately the students who participated in the project. Moreover, the teachers reported that the Change Laboratory has contributed to the students' sense of initiative. It improved their self-esteem, and demonstrated that the sense of initiative must be collectively addressed. Additionally, it showed that in the Change Laboratory problems can be turned into resources if analysed cooperatively with a positive attitude.

The two technical teachers who took part in the workshops gave thought to how to repeat the project. One of the teachers took the lead and went to the local industry association asking for companies willing to take students for school work alternation pathways. The project was to have students starting work experience at the end of Grade IV, lasting four to six weeks. At the same time the school principal asked the researcher to return to Italy and set up Change Laboratory workshops. In the end the project did not commence for a variety of reasons. First, the researcher was in Australia and one teacher did not feel capable of undertaking this project without him. Secondly, both teachers knew they would be busy with the graduation exams and did not have much time to organize the students' work placement. Thirdly, only a few students were keen on undertaking work placement during school holidays.

This seems to prove, on the one hand, that the project has been successful and that the school is studying how to embed it into the normal routines. On the other hand, the right modality to implement it still needs to be found in order to overcome the many problems that school work alternation generates when only one group of students leaves the class. Unfortunately even though the future of work experience was seen as valuable, it still had to be put into practice. The school principal, the teachers and the researcher are working to implement a new pilot project to make school to work alternation available for as many students as possible in the future.

5 What do Italian students think about entrepreneurship?

When I see the studies of young men at the period of their greatest activity confined to purely speculative matters, while later on they are suddenly plunged, without any sort of experience, into the world of men and affairs, it strikes me as contrary alike to reason and to nature, and I cease to be surprised that so few men know what to do.

Rousseau (1866): The Emile, Chapter III.

This chapter will present the results of the Italian part of the project as combining the work experience and Change Laboratory workshops data. It will first present the results of the questionnaire given to the participants in the Change Laboratory workshops. This is made of two parts - the multiple choice answers and the open questions. While the first part of the questionnaire was given to the students only to see whether an improvement in the competence of the sense of initiative and entrepreneurship had taken place, the second part was administered to all the participants. The aim of the second part of the questionnaire was to solicit feedback on the entire project and to investigate the object of the research, the sense of initiative and entrepreneurship. This part of the questionnaire also sought to analyse the meanings attributed to the Change Laboratory. The following section will continue with the description of another source of data obtained during the workshops, that is the

Questo capitolo presenta i risultati della parte italiana del progetto come combinazione di esperienza lavorativa e Change Laboratory. Si parte dai risultati dei questionari somministrati ai partecipanti durante l'ultimo laboratorio; questi sono composti da due parti, domande a risposta multipla e domande aperte. Mentre la prima parte è stata somministrata ai soli studenti per vedere se c'è stato un incremento nella competenza relativa al senso d'iniziativa e d'imprenditorialità a seguito dell'esperimento, la seconda parte è stata data a tutti i partecipanti; lo scopo era di ottenere un feed-back rispetto all'intero progetto. Quest'ultima parte ha cercato di analizzare ai significati che i partecipanti hanno attribuito al Change Laboratory come pure al senso d'iniziativa e d'imprenditorialità. La sezione successiva descrive un altro tipo di dati ottenuti durante i laboratori, cioè i tre poster eseguiti dagli studenti: mentre uno riguarda un aspetto del senso d'iniziativa e d'imprenditorialità, cioè

three banners created by the students. One concerns an aspect of the sense of initiative – how a student could be proactive in the workplace. The other two concern the ideal work experience. These sources of information will be put together to draw conclusions on the Italian part of the research. The last section will discuss the 'school to work alternation' tool recently introduced in Italian schools to allow long work experience in light of the idealistic culture separating school and work and the difficult times Italy is going through.

come uno studente possa mostrarsi proattivo sul posto di lavoro, gli altri due illustrano l'esperienza lavorativa ideale. Queste diverse fonti d'informazione sono poi sintetizzate per trarre conclusioni sulla parte italiana della ricerca. L'ultima sezione del capitolo discute l'alternanza scuola lavoro, strumento formativo introdotto di recente nella scuola italiana che permette allo studente lunghi periodi di stage; il modello dell'alternanza viene poi discusso alla luce della cultura idealistica che separa scuola e lavoro, e del difficile momento che l'Italia sta vivendo.

(Vedi riassunto a fine capitolo).

5.1 The questionnaire: results of the multiple choice answers.

In this section the results from the multiple choice questions in the questionnaire on the 7th European key competence of the sense of initiative and entrepreneurship will be explored. The multiple choice questionnaire was addressed to the 13 Italian students participating in the research, and was administered during the last session of the Change Laboratory on 25 October 2012.

Following the EU definition of competence (see European Commission, 2007), the questionnaire was divided into three parts, each of them dealing with a different aspect of competence: knowledge, skills, and habits. Each of these features is inspected along four further dimensions: (1) to what extent the students think they have learned this part of the competence over the project (Change Laboratory workshops and work experience); (2) a subjective evaluation of the overall proficiency of the knowledge/skills/habits mostly based on the EQF levels; (3) the importance attributed to the students' professional development. For each of these questions the students stated their perceived level on the basis of four levels. The complete results are shown in the Appendix. In line with the source of ordinal data, the parameter used to represent the distribution is the median. This is defined as the numerical value separating the higher half of a sample.

Knowledge

The table below shows the results of knowledge related to the sense of initiative and entrepreneurship.

Table 5-1. Students' perception of outcomes of work experience plus Change Laboratory workshops. Knowledge related to the sense of initiative and entrepreneurship.

Knowledge		Students' perceived improvement in the two months' experience (median)	Students' perceived level according to EQF levels (median)	Importance attributed for students' professional growth (median)
1	Services for students in my school	Not at all	3 Facts, principles, processes and general concepts	Somewhat
2	Professional Practices at my work place	Very much	4 Factual and practical in broad contexts	Very much
3	Job opportunities and contraints	Somewhat	3 Facts, principles, processes and general concepts	Somewhat
4	Available Job opportunities once graduated	Somewhat	3 Facts, principles, processes and general concepts	Somewhat
5	Social and moral role of the industry area	Somewhat	3 Facts, principles, processes and general concepts	Somewhat

Italy (n=13).

In the rows on the left the table lists five areas chosen to represent knowledge: services for students in the student's school, professional practices as well as the job opportunities and constraints in their workplace, available job opportunities once graduated, and the social and moral role of the industry area. The columns in the table are: the degree of improvement during the two months' experience (from "not at all" to "very much"); the perceived level on the basis of statements directly linked to the EQF model (from level 2 to level 5); and finally, the importance attributed to this competence (from "not important" to "very much") for the students' professional development. For each of these questions the student had to state their perceived level on the basis of four choices.

Overall, it is clear that the students' greatest increase was in knowledge related to the workplace practices, but they did not learn more about the services for students in their school. The corresponding EQF level connected to the knowledge of work practices is 4, 'factual and practical in broad contexts'. This is the only source of knowledge considered really important for their professional development.

On analysis, the students think they have gained a certain understanding ('somewhat') of the knowledge connected to: the job opportunities and constraints at the workplace; the available job opportunities once graduated and social and moral role of the industry area. Moreover, the youth think they have learned very much about the professional practices at their workplaces. On the other hand, they do not perceive that they have learned anything about the services for students in their school. As concerns their perceived level of knowledge according to the EQF model, the students would place themselves at level 3 - facts, principles, processes and general concepts in a field of work or study. They evaluate their workplace knowledge of professional practices at level 4 - factual and theoretical knowledge in broad contexts. In relation to the importance for their professional development, the knowledge connected to the sense of initiative and entrepreneurship is perceived as 'somewhat' noteworthy. Only the knowledge related to the professional practices in the workplace is considered by the students to be very valuable.

Skills

The table below illustrates the results of the questionnaires concerning the skills related to the 7th European key competence.

Table 5-2. Students' perception of outcomes of work experience plus Change Laboratory. Skills related to the sense of initiative and entrepreneurship.

Skills		Students' perceived improvement in the two months' experience (median)	Students' perceived level according to EQF (median)	Importance attributed for students' professional growth (median)
1	Project Work	Somewhat	3. Under supervision but I make some decisions	Very much
2	Planning	Somewhat	3. Under supervision but I make some decisions	Very much
3	Problem solving	Somewhat	3. Under supervision but I make some decisions	Very much
4	Communicate new ideas	Somewhat	4. To solve specific problems	Very much
5	Negotiate a solution	A little bit	3. To solve problems applying	Very much

			basic methods	
6	Team working	Somewhat	4 I actively participate	Somewhat
7	Self-organize school and work activities	Between somewhat and a little bit	3. Under supervision but I make some decisions	Between very much and somewhat

Italy (n=13).

The rows present the seven skills chosen to represent the sense of initiative and entrepreneurship: project work, planning, problem solving, communicating (new) ideas, negotiating a solution, team working, self-organizing school and work related activities. The columns contain the degree of improvement during the two months' experience (from 'not at all' to 'very much'); the owned level on the basis of statements linked to EQF (for questions 1, 2, 3 and 7 from level 1 to 4; for questions 4, 5, 6 from level 2 to 5); the importance attributed to the relative skill (from 'not important' to 'very much') for one's professional development.

Overall, the students claim that over the experience they have somewhat improved most of their skills. Their ability to communicate new ideas is rated by them at an EQF level 4, that is to solve specific problems. Their teamwork is also at EQF level 4, as they actively participate in the group activities. Finally, most of the skills connected to the sense of initiative are considered to be significantly important for their professional development.

On close examination of the data, there has been some improvement over the experience for 5 out of the 7 skills listed to represent the sense of initiative and entrepreneurship. These are: project working, planning, problem solving, communicating ideas and team working. In contrast, the students only learned a little bit about negotiating a solution, and between 'a little bit' and 'somewhat' about self-organizing their work or school related activities. In relation to the students' perceived level of abilities according to the EQF, only in team working and communicating their (new) ideas their EQF level is 4, that is, a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study. In all the other five abilities listed the students placed their skills at EQF level 3 that is, to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information. As far as the importance of these skills is concerned, most of them seem to be 'very much' of value for the students' professional development. Self-organization of one's activities is rated between 'somewhat' and 'very much', and teamwork 'somewhat' of value.

Habits

The table below shows the results of the questionnaires concerning the habits related to the sense of initiative and entrepreneurship of the sample of thirteen Italian students.

Table 5-3. Students' perception of outcomes of work experience plus Change Laboratory. Habits related to the sense of initiative and entrepreneurship.

Habits		Students' perceived improvement in the two months' experience (median)	Students' perceived level (median)	Importance attributed for students' professional growth (median)
1	Self confidence	A little bit more	Good	Between very much and somewhat
2	Creativity	A little bit more	Good	Very much
3	Taking the initiative	A little bit more	Good	Very much
4	Risk taking	A little bit more	Excellent	Very much
5	Perseverance	A little bit more	Excellent	Very much
6	Resourcefulness	A little bit more	Good	Very much
7	Self-management	A little bit more	Good	Somewhat
8	Judging my own strengths and weaknesses	A little bit more	Good	Somewhat

Italy (n=13).

In the rows on the left the table lists eight attributes chosen to represent the habits related to the sense of initiative and entrepreneurship: self-confidence, creativity, taking the initiative, taking risks, perseverance, resourcefulness, self-management and capacity to judge own strengths and weaknesses. The results of the three dimensions related to these habits are in the columns: the degree of improvement during the two months' experience (from 'less than before' to 'much more') as well as the levels the students thought they were at. As the EQF model does not report levels of attainment for habits, values spanning from 'not existent' to 'excellent' were used. The last column is dedicated to the importance attributed to this competence for the student's professional growth (from 'not important' to 'very much').

In short, the students report that their habits connected to the sense of initiative and entrepreneurship have improved slightly since the beginning of the experience. Moreover, they perceive them to be at good levels, two of them being excellent. Most of the habits listed are considered very important in the light of their professional development.

In detail, the students report that they have increased a little bit more in each of the eight attitudes listed. The students' perceived level of risk taking and perseverance are

'excellent'. For the other skills the perceived levels are 'good'. As far as the importance of these attitudes, creativity, taking the initiative and risks, perseverance and resourcefulness are considered 'very important', whereas self-management and the capacity to judge their own strengths and weaknesses are only considered somewhat noteworthy. Finally, self-confidence is between 'somewhat' and 'very much'.

The next paragraphs will provide an overview of the knowledge, skills, and habits connected to the competence of entrepreneurship that the youth have gained over the experience (both the workshop and work placement).

Summary of knowledge, skills and habits related to the sense of initiative

The table below summarizes the data gathered from the questionnaires in terms of overall knowledge, skills and habits related to the competence of sense of initiative and entrepreneurship.

Table 5-4. Students' perception of outcomes of work experience plus Change Laboratory. Medians of knowledge, skills, and habits related to the sense of initiative and entrepreneurship.

Medians	Students' perceived improvement in the two months' experience (median)	Students' perceived level (median)	Importance attributed for students' professional growth (median)
Knowledge	Somewhat	3 EQF	Somewhat
Skills	Somewhat	3 EQF	very much
Habits	A little bit more	Good	very much

Italy (n=13).

According to the medians of the data gathered, the students felt they 'somewhat' improved in the knowledge and skills that make up the competence of the sense of initiative and entrepreneurship. At the same time, they improved only 'a little bit more' in the habits. The EQF perceived level of their knowledge and skills was 3, working or studying under supervision with some autonomy, and the habits connected to this competence were perceived at a 'good' level. Finally, while the skills and the habits related to the sense of initiative were perceived as very important for the Italian students, the knowledge was considered only 'somewhat important'.

5.2 The questionnaire: results of the open answers.

This section will explore the results obtained from the open questions. The open questions aimed to inspect the object of the research, that is the sense of initiative and entrepreneurship as well as the Change Laboratory workshops. This part of the questionnaire was given to all the participants in the workshops: thirteen students, four work tutors and three teachers. It was administered together with the multiple choice questions in the last Change Laboratory session on October 25.

The answers are important in discovering the way participants value and signify the sense of initiative and entrepreneurship, the Change Laboratory and the overall experience. The questionnaire was composed of five open questions. The first enquiry asked participants to define the sense of initiative and entrepreneurship. The following three questions (numbers 2, 3 and 4) examined the Change Laboratory: question number 2 asked what the respondents thought they gained from the participation in the workshops; and the following two questions (3 and 4) concerned the strengths and weaknesses of the Change Laboratory according to a SWOT analysis model. The 5th and last enquiry asked the participants how they would improve the overall experience of two months' work experience and weekly workshops.

For each of these questions the participants had from two to four blank lines to write their response. The answers were then transcribed into a table. Classes were then inferred by inductive reasoning. Where possible the researcher tried to use common categories valid both for the Australian and Italian answers. It should be noted that, as these questions were open ended, each participant could respond with one or more sentences. As a result, it was possible that each response (or part of it) fell into two or more categories. Hence, the overall number of answers is more than the total of the subjects.

In most of the tables the answers are separated according to the role of the respondents: work tutors, teachers and students. By so doing it is possible to notice interesting trends related to the different point of view of the participants.

Question 1: what do you think the sense of initiative and entrepreneurship means?

The first open question asked participants to define the sense of initiative and entrepreneurship. As this question was asked first, it is unlikely that it was biased by the

second part of the questionnaire which inspected this competence on several dimensions. The table below reports the results.

Table 5-5. Open question inquiring about the sense of initiative and entrepreneurship.

1) What do you think the sense of initiative and entrepreneurship means?					
Dimensions		Work Tutors	Teachers	Students	Total
Agency	Problem Solving	2	3	3	8
	Getting involved	1	1	4	6
	Initiating			3	3
					17
Commitment	Taking responsibility	1	2	7	10
	Being engaged	1		2	3
					13
Creativity	Having ideas and proposing	1		4	5
	Turning ideas into action			2	2
					7
With whom?	Being able to carry out tasks autonomously		1	3	4
	Cooperating with others, participating	1		2	3
					7
Where?	Especially in the work place		1	3	4
	Anywhere			3	3
					7

Italy (n=19). The answers were reduced into categories.

In the first column on the right five possible dimensions have been identified by the researcher as second order categories by which to group the first order concepts (in the second column).

Overall, the sense of initiative has three main components: agency, commitment and creativity. It can be mobilized anywhere, especially in the workplace, either autonomously or in cooperating with others.

The first three dimensions of the sense of initiative and entrepreneurship concern the core of this competence. In the first dimension responses relate to the participants' *agency* as the state of being in action or of exerting power: problem solving, getting involved (in the sense of getting busy), and initiating something. The second dimension deals with the *commitment* needed when undertaking a task: taking responsibility and being engaged. The third dimension reflects *creativity*: turning ideas into action and proposing ideas.

The last two dimensions of the sense of initiative and entrepreneurship are situational, concerning responses to questions which ask 'who' and 'where'. Hence, this competence

can be mobilized either autonomously or cooperating with others. It can be put into action in the workplace or anywhere else.

It is interesting to note that the sense of initiative is mainly about agency with 17 answers mentioning this aspect, regardless of the participants' role. Commitment (13 responses) and creativity (seven responses) were two important aspects for the students. Regarding the dimension of cooperation and autonomy, just over half (4 out of 7) of the people who mentioned it thought that the sense of initiative is about the capacity to carry out tasks autonomously. The remainder (3 out of 7) mentioned the ability to work cooperatively. The same figures are true of the last dimension, which dealt with mobilization of the sense of initiative and entrepreneurship: nearly half of the answers (3 out of 7) claimed that the sense of initiative is useful in every domain, the rest thought that it is mostly useful in the workplace.

The next three questions concern the Change Laboratory.

Question 2: what do you think you have gained from participation in the Change Laboratory?

In this question the participants are asked what they believe they gained from participation in the workshop. The table below reports the results.

Table 5-6. Open question inquiring about the gains from participation in the Change Laboratory.

2) What do you think you have gained from the participation in the Change Laboratory (that is, in the meetings)?					
Dimension		Work tutors	Teachers	Students	Total
Reflexive attitude (Better Understanding)	... of the work practices			3	3
	... of the points of view of the other parties	1	2	2	5
					8
Improved communication	relationship among the parties (cooperation)	1		6	7
More agency	Stating my ideas, participating actively in the meetings			3	3
Nothing				1	1

Italy (n=19). The answers were reduced into categories.

In short, the participation in the Change Laboratory engendered more reflexive attitudes and improved relationships and agency.

From the answers it became apparent that this question was misleading for some of the participants (interestingly mostly tutors and teachers) as they understood it to be

about how they contributed to the meetings. Nevertheless, three broader categories could be inferred (listed in the first column on the left). The first gain from participation in the workshop related to a *reflexive attitude*, a better understanding of the work practices and the others' different points of view. A second gain from the attendance was *better relationships* between the participants, as they cooperated to solve problems. A last gain was in relation to a dimension which could be thought of as *agency* - the respondents learned how to state their ideas and take part in the workshops.

In detail, the most important benefit from participation was in relation to reflexive attitude (8 answers). While students, teachers and work tutors felt they gained a better understanding of the others' point of view, only students mentioned that they obtained a better understanding of the work practices. The second important gain for students (6 out of 7 answers) dealt with the improved relationship between the parties, not only with regards to teachers and work tutors, but also other schoolmates. The third improvement was agency: the students learned to state their ideas and actively participate in the meetings. Only one student said s/he has not gained anything from the workshop.

The next two questions (3 and 4) were from a SWOT analysis point of view.

Question 3: what do you think the strengths of the Change Laboratory are?

In the third open question participants were asked to think about the advantages of the Change Laboratory. The table below reports the results.

Table 5-7. Open question inquiring about the strengths of the Change Laboratory

3) What do you think the strengths of the Change Laboratory are?					
Dimension		Work Tutors	Teachers	Students	
Factual	Bringing school and workplace together	4	1	2	7
	Active feedback from the parties		2	4	6
	Improving the students' skills			1	1
					14
Relational	Working together to solve problems		1	3	4
	Putting forward their own ideas			1	1
	Any problem can be discussed			4	4
					9

Italy (n=19). The answers were reduced into categories.

Overall, the strengths of the Change Laboratory were mainly practical for teachers and work tutors. At the same time, the advantages were both factual and relational for students.

As for the other questions, and echoing Bales' analysis interaction process (1950) [1], two categories emerged from the analysis. The first was factual (in the sense of concrete, practical), and the second was relational. Looking at the answers, the participants thought that the advantages of the Change Laboratory were more factual than relational (14 against 9). However, looking at the numbers from another point of view, while an overwhelming majority of answers given by teachers and work tutors (7 out of 8) emphasized the factual advantages of the Change Laboratory, the students were split: half underlined the factual benefits and half pointed out the relational strengths.

Among the factual advantages of the Change Laboratory, the participants (especially mentors) said that it contributes to bringing school and work together; another advantage was the active feed-back from the various parties involved. It also contributed to enhance the students' skills. Moving to the relational strengths of the Change Laboratory, the participants said people worked together to solve problems. Further, each participant was able to propose their ideas, and any problems could be discussed during the meetings.

Question 4: what do you think the weaknesses of the Change Laboratory are?

The fourth question deals with the weaknesses of the Change Laboratory and the table below reports the results.

Table 5-8. Open question inquiring about the weaknesses of the Change Laboratory

4) What do you think the weaknesses are?		
I do not see any, as one could discuss about every problem		5
Organization of the overall project (workshops plus work experience)	Too much time out of the classroom while the teachers were teaching the rest of the class 4; Experience too long or too short 2; Wrong period of the school year 1; Too expensive for the employer 1; The cooperation between school and workplace is still not enough 1.	9
Participation	Only possible for a limited number of students 2; Not everybody participates actively 1; Students are afraid to share their points of view 1; Possibility to be misunderstood 1;	6

[1] With his analysis of group work Bales aimed at distinguishing two types of leadership: task-oriented and socio-emotional.

	More humbleness needed when intervening 1.	
Characteristic of the Change Laboratory	Too bad we did not succeed in implementing the future vision of work experience 1; Too much time spent on the vision instead of discussing our present problems 1.	2

Italy (n=19). The answers were reduced into categories.

Overall, the weaknesses of the Change Laboratory concerned organization and participation. However, some participants said they could not identify any downside.

The wording of this question was slightly misleading as it used a pronoun to omit the subject, the Change Laboratory, which had already been utilized in the previous question. Some respondents took this question to be about the downsides of the overall experience.

The first group of issues is more connected with the organization of the entire project, rather than the workshops. The problem was that too much time was spent out of the classroom, while in the classes the teachers were continuing with teaching the curriculum. Other complaints mentioned the duration of the experience, too long or too short, and that it was in the wrong period of the year. In addition, one work tutor said this work experience was too expensive for the employers, and another felt the cooperation between school and enterprises was not enough.

The second group of weaknesses of the Change Laboratory deals with participation issues. First, not all the students participated actively in the workshops. Secondly, this project was available only for a dozen youth, and they were the only ones who could participate in the Change Laboratory. Thirdly, students may have felt intimidated - thus unwilling to share their thoughts, or felt they could have been misunderstood by the other participants. Fourthly, a student pointed out that more humility was needed when speaking; he probably meant that some schoolmates during the meetings pretended to know more than they did.

A final category of weaknesses identified was intrinsic to the Change Laboratory toolkit. Even though a new idea of work experience was discussed and envisioned, the group could not put it into practice. Although the participants did not use this terminology, it was not possible to complete the cycle of expansive learning and put into practice the new idea of long work experience. A participant criticized the fact that too much time was spent in envisioning the future of work experience instead of talking about the actual problem facing the students, which was how students could make up the lessons they were losing.

However, it is also important to note that for five participants there were no drawbacks to the Change Laboratory.

Question 5: how would you improve work experience in your school?

The fifth and last question seeks advice on how to improve the overall project. The results are shown in the table below.

Table 5-9. Open question on how to improve the overall project (work experience plus Change Laboratory).

5) How would you improve work experience in your school?					
		Work Tutors	Teachers	Students	
Time	Shorten it (from 2 months to 1 and a half)	1	1	5	7
	Move it to another period (end of the school year)	1	1	3	5
	Work during the week and go to school on Saturdays			1	1
					13
Who	Extend it for all the students (1 month' long)		1	3	4
	Only for the best performing students		2	3	5
	More teachers to be involved		1		1
					10
Planning	Organize it better (in the: contents, phone calls, information days to the parents)	1		3	4
	Find only private employers			2	2
	More visits in the building sites	1		2	3
					9

Italy (n=19). The answers were reduced into categories.

As this project involved different organizations for the two settings, this question was analysed separately. The Italian answers were classified into three main categories, and all the suggestions are practical; they address time, who to involve, and how to organize it better.

Out of the three categories, it is not surprising that most of the improvements deal with time, as the overlap between teaching and work experience was the main source of concern for the students: shortening the experience; moving it to another period of the year; working during the week and going to school on Saturdays, so as to make up part of the lessons. The second category gives advice on who to involve. Interestingly it is polarized: while some think this experience should be shortened to one month and 'democratized' - being extended to all the students, others thought it should be kept for

the best performing students. Another suggestion was to involve more teachers in the project, so that all the teachers could realize how important it is. The third group of improvements proposed to improve planning. Students recommended that they be asked to take part in the project ahead of time and not just a few days before. They also suggested having more information days, as well as the use of private employers only, so that there would be more chances for students to be hired by the same company after graduation. Students also suggested having visits to the building sites after the work experience to check on the state of completion.

Thirteen suggestions are about time and ten concern who to involve, whereas nine concern better planning. Notably, no work tutor expressed their opinion on which students should undertake work experience as they probably thought this was an issue concerning the school. No teacher suggested improvements in the organization.

5.3 The banners made by the students

This section will provide a description of the three most relevant banners produced by the students during the meetings. These concern how students should take the initiative in the workplace and the ideal work experience. For each of the diagrams a description and translation is provided, as the original ones are in Italian. The section will then analyse the most important elements that emerged from the diagrams.

What is the sense of initiative like (the students say)?

This is a poster made by the entire group of 13 students on September 27. During that meeting a few students complained about their work tutor, as apparently he had been absent for a few days and left the students unattended without anything to do. During the workshop it was agreed that it was up to the students to show initiative at their workplace, and ask the tutor or his colleagues what they could do to help. The group then discussed how to show initiative in the workplace. At the end of the session the students were asked to summarize the outcomes of the discussion. The students came up with the banner below where they interpreted the sense of initiative as the ability to propose actions in the workplace.

Figure 5-1. Diagram on the sense of initiative according to the students.

Italy (n=13).

At the top of the banner the students wrote 'group work' and the date. The main concept (*propositività* = initiating) is in the centre of the diagram in blue (bigger font), and red arrows (3 on the top and 5 plus one on the bottom) connect it to nine related concepts (in blue). From the top left in clockwise order, the nine concepts connected to the main concept are: directly proportional to interest in the matter; being able to establish and reach the goal autonomously; depending on the personality and the context; being able to take responsibility; asking questions; the work tutor has to be stimulating and active; open mind (in the frame); being optimistic; when having a problem, having proposals for its resolution ready.

The concepts of the schema were grouped into three classes: *personal commitment*, *autonomous problem solving in conditions of uncertainty*, and *contextual variables allowing initiative*. The relationship with the mentor is of primary importance in building up this competence in the workplace.

According to the students, one's ability to show initiative is proportional to one's interest in the matter. It is therefore important for students to ask questions of their tutor and to listen carefully, thus having an 'absorbing mind'. This term was first used by a work tutor, and underlines a student's readiness to learn from experience in the workplace without being told what to do by the work tutor. During the same meeting it was suggested that such readiness is developed by the school, which provides the basis for learning upon which the employer can build the situated competence needed in the specific work environment. Moreover, the ability to show initiative is linked to taking responsibility and being optimistic, both of which are necessary when embarking on a new enterprise. Taken together, these dimensions indicate the *commitment needed to show initiative*. Five out of the nine dimensions are connected to this dimension, making it the most important one.

The student should also be able to set and reach goals in relative autonomy. Proposing means, when faced with a problem, to go to their mentor with some possible solutions instead of going to him and simply saying "I have a problem, what can I do?". This tip was given by a work tutor and was taken up immediately by the students. Collectively, those aspects might be connected to a dimension of autonomous problem solving in conditions of uncertainty typical of the unstructured contexts, as could be the situation in surveying.

The third dimension relates to contextual variables permitting initiative. One of them may be the student's personality - as s/he may be shy. Another variable is the context which allows or prevents initiative. It is therefore important that the tutor play his part in making the student feel comfortable, for example by being encouraging. No mention of showing initiative in the classroom is reported in the diagram.

The 'ideal work experience'

Below are two banners made by the students on the second last workshop held on October 18. After the discussion on how to improve work experience at the school the next year, the students were asked to create a poster, the subject was 'the ideal work experience' (in Italian, the word used for work experience is *stage* pronounced in French). This time the students were asked to work in two groups, so that each student could make a personal contribution to the artefact. The grouping reflected the two classes, A and B.

In summary, the first banner is very similar to the previous one on how to show initiative in the workplace, thus demonstrating the close relationship between the

competence of the sense of initiative and entrepreneurship and the workplace. The second diagram concentrates on the skills and knowledge to be gained during work experience. In both banners length and period of work placement are common concerns for the students.

Below there is a picture of the first banner made by the students of section A.

Figure 5-2. Banner made by the first group of students on the ideal work experience.

Italy (n=6).

The title of the banner is at the top of the page and is framed. The only colour used is blue. Similarly to the previous poster eight arrows connect the main concept, the perfect work experience, with the other ideas. From the top left to the bottom left these are: diversified jobs, willingness to participate, starting the experience in middle August, autonomy to carry out projects. The concepts on the right are (from the top): establishing a good relationship with the tutor; duration from 4 to 6 weeks; varying the workplaces; following the same project from the beginning to the end.

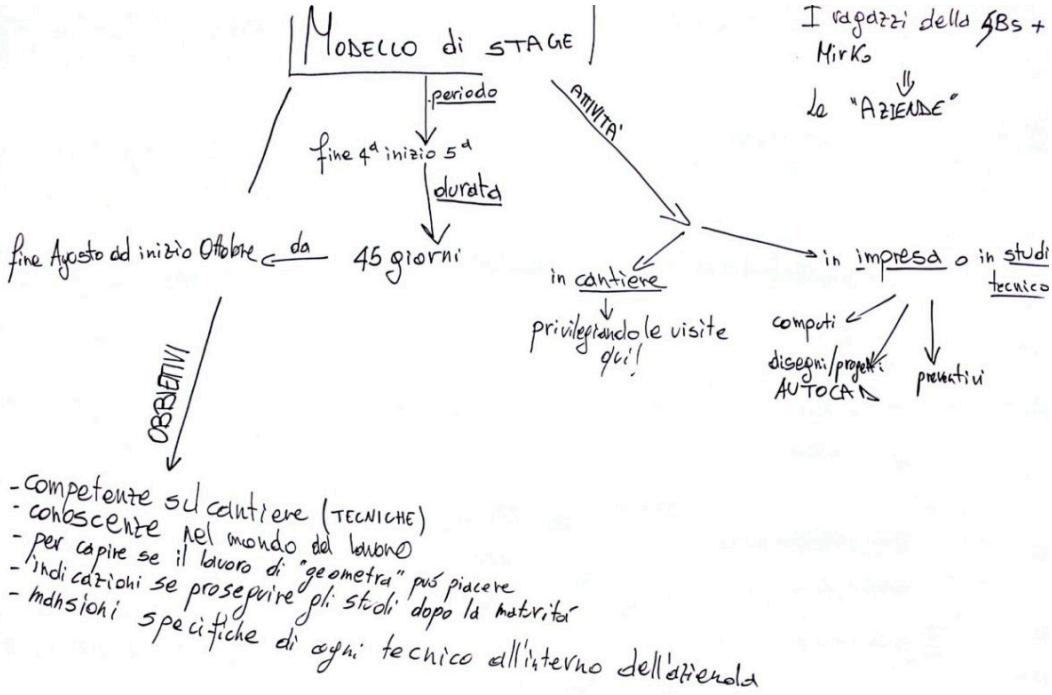
Overall, four groups summarized this banner: duration and start; varied project work in autonomy; willingness to participate; and good relationship with the work tutor.

Project work is mentioned in four out of the eight items and appears to be the most important topic in the diagram. The students said that projects should be carried out autonomously and followed up over long periods, from the beginning to the end. The ideal work experience should provide them with different projects and a variety of work environments. Here the students stressed the need to have a whole vision of the issues related to their profession. In order to avoid overlapping problems between school and work, the 'ideal work experience' should start before the end of the holidays, in middle August, and last from four to six weeks. There are two other aspects of work experience that the students consider of consequence, one related to their attitude and the other being relational. They have to be willing to participate in the work activities and their relationship with their tutor is of utmost importance.

Project work in autonomy, the educational relationship with the work tutor, the willingness to participate, thus the student's involvement, are central themes of this banner, and these are in common with the banner on how to initiate in the workplace. The commonality of themes demonstrates that the students saw a close relationship between the competence of the sense of initiative and the workplace.

The following banner was created by the students belonging to section B.

Figure 5-3. Banner made by the second group of students on the ideal work experience.



Italy (n=7)

In summary, this poster illustrates the goals, the duration and commencement of work experience, as well as the activities to be undertaken during work experience.

The title and main concept, 'model of work experience', is framed at the top middle of the diagram. The colour used is black. In the top right authors are identified as: 'the guys of Grade VA'; the group named themselves 'the companies'. There are three main branches linked to the title (from the left): objectives, period, tasks. Some words are in lowercase, some are capitalized, and some underlined so as to show a hierarchy of concepts. In the left part of the diagram the objectives are listed in five bullets: technical competencies on the building site; knowledge of the world of work; understanding whether surveying may suit the students; giving advice on whether to continue studies after the diploma; (understanding the) specific duties of every technician within the company. In the middle branch: period (underlined), end of Grade 4, beginning of Grade 5; duration (underlined), 45 days from the end of August to the beginning of October. On the right branch, from the word 'tasks' (capitalized) there are two further arrows. The one on the left is 'in the building site' (underlined), 'endorsing visits'. The other arrow on the right is 'either in an enterprise or design studio' (both underlined). From there, three arrows lead to 'computations', 'AUTOCAD drawings or projects' and 'estimates'.

Seen in terms of the triangle of Engestrom (1987, p.78), the second banner on the ideal work experience highlights the outcomes of participation in an activity in terms of goals, tools, division of labour and community. From the student's point of view, work experience could assist in gaining technical competencies, but also be useful in understanding whether the profession suits the student, and in suggesting possible work or study pathways after the school diploma[2]. There are goals in terms of mastering the typical tools of the building surveyor: software such as AUTOCAD, metrical computations and estimates. Students should also become knowledgeable about the community and division of labour within the enterprise, knowing who does what, especially which professionals (engineers and architects) the surveyor interacts mostly with. There are two further mediating factors to maximize learning during work experience: time and place. In relation to 'time', it is important to choose where to carry out work experience: in private companies or design studios[3]. In relation to 'place', again time is a key point for students' learning. Work experience should be undertaken between the end of Grade IV and the beginning of Grade V, so it does not conflict with the graduation exam preparation. Furthermore, six weeks is enough time to learn in the work place, and the ideal period would be from the end of August to the beginning of October. Again, the students manifested their concern about the overlap between school and work activities. They suggested reducing and anticipating work experience.

There are similarities and differences between these two last banners. Both reproduce most of the discussions had during the workshops. It seems again that length and period of work placement are common concerns. In both posters students do not suggest who should be entitled to undertake it – whether all the students in a class or only a part of the class, and the criteria for access.

In regards to the differences it may be said that the two banners are complementary, as one sees learning from the individual point of view, while the second sees it as a participation process. The first diagram depicts a motivated student who learns how to project work within an educational relationship with his/her work tutor. The second diagram stresses the learning outcomes from participation in a working activity, and points out goals, tools and understanding of the division of labour the student should gain during

[2] The object of the activity and the outcomes are important for sense making (Engestrom, 2001b).

[3]The local government perceived as not being the ideal environment, as there is no possibility of students being hired there after completion.

work experience. The first diagram focuses more on the processes involved in work experience, whereas the second diagram focuses on the outcomes of work experience.

5.4 Discussion

This section will discuss the outcomes of the Italian research. It will first summarize the data gathered from the multiple choice and open questionnaires and the posters. These data will then be used to draw conclusions as to what extent the combination of Change Laboratory workshops and work experience have promoted the sense of initiative in the participants, especially the students. In conclusion this section will discuss the value of work and work experience for the students' education.

Summary of the results

In summary, the students' multiple choice questionnaire on the sense of initiative showed the most improved knowledge over this experience (work placement plus workshops), linked to the professional practices at the students' workplace. It peaked at EQF level 4 (factual and theoretical in broad contexts), and was considered the most important knowledge for their professional development. On the other hand, the knowledge of the services for students in their school did not increase. Although this was a matter of discussion over the workshops, and there certainly have been services for students which have been active throughout the school's history, it appeared that students still thought there were no services for them. Concerning the skills related to this competence, the students felt they had learned only a little bit about how to negotiate a solution. However, they felt their capacity to communicate ideas and work in a team was at an EQF level 4, to generate solutions to specific problems. At the same time, teamwork was only somewhat important for their professional development. In relation to habits, they believed they knew how to take risks, and were able to persevere when faced with problems. Self-management and judging their own strengths and weaknesses were reported to be only somewhat of importance for their professional development.

The fact that the students believed they reached an EQF level 4 for some knowledge and skills is of significant importance. These seem to be connected both with the workshops and work experience. An EQF level 4 in terms of autonomy means that the student is able to exercise self-management within the guidelines of work or study contexts that are usually predictable, but sometimes subject to change. The same level

should be the learning outcome at the end of the high school degree (ISFOL, 2012), and for some features, such as knowledge of the work practices, this was obtained in only two months.

The responses to the open questions revealed the participants' generally positive attitude toward the experience. When asked about the sense of initiative and entrepreneurship (1st question), they said it was mostly about agency, commitment and creativity. The dimension of autonomy plays a crucial role, as well as the capacity to work in a team. It is true that the sense of initiative and entrepreneurship is put into action mostly in the workplace, but individuals should show initiative in every life domain. When asked to state their gains from participating in the Change Laboratory (2nd question), participants said that they had developed a better understanding (as reflexive practice), as well as improved relationships and agency. The strengths of the Change Laboratory (3rd question) are both factual and relational. The few weaknesses (4th question) concern organization and participation. To improve this experience (5th question) the participants suggested changes related to time and organization. The issue regarding which students should undertake work experience is more controversial.

During the workshops the students produced three important posters. The first was about how to show initiative, and identified three main features: commitment, autonomous problem solving and contextual variables allowing personal initiative. The other two banners were about the ideal work experience. They both pointed out issues connected with time (duration and period of the year) so as to minimize the overlap between work placement and school lessons. One focused on the process (project work in autonomy, willingness to participate and good relationship with the mentor), and the other focused on the product (goals and activities).

Analysing the first poster on the ability to show initiative in the workplace from Activity Theory's point of view, the poster seems to gather the common ideas the participants shared during the meetings. This made the researcher think of collective concept formation (Engestrom et al., 2005). An abstract germ cell (for example, how to show initiative) is collectively generated, and then is enriched with more practical ideas (the vertical shifts), for example, when having problems going to their mentor with a possible solution. This is also a good example of horizontal shifts, as the poster captures one of the different perspectives during the meeting. As an effect of double stimulation,

during Change Laboratory workshops the participants tended to transform the second stimulus given by the researcher – the competence of the sense of initiative and entrepreneurship – into a concept that could better mediate their need – how to show initiative in the workplace.

According to Engestrom (2003), a fruitful way to study concept formation is through Cussin's theory of cognitive rails: "people learn to move around in a territory by moving around in the territory. In so doing, they make cognitive trails as cognitive space the participants return to" (p. 5). Engestrom et al. (1996) also contends that collective concept formation precedes action. Most of the concepts in the poster on how to show initiative are also repeated in the 1st open question on the sense of initiative and entrepreneurship: autonomy, responsibility, proactive problem solving, interest. Hence, these terms are repeated both collectively and individually and may stand for a collective concept preceding the individual's conduct. Together the participants shaped the concept on how to show initiative in the workplace and this concept led their conduct when they wanted to show initiative in the workplace.

Learning at the boundary: Change Laboratory and sense of initiative

Creative problem solving is an important dimension of the sense of initiative emerging as a strength of the Change Laboratory (3rd question). During expansive learning cycles there are moments of interiorization - when the participants learn about a consolidated practice, and moments of creative externalization, when innovations emerge (Ajello et al., 2005). During the 6th workshop three ideas emerged that suggested how to overcome the overlap between school and work experience: presentations to be delivered during the open council to get the teachers to think about the meaning of this project; a portfolio and a report of the activities done during work placement to be discussed during the graduation exam; personalized programs during school lessons.

In the model of integrative pedagogy, it is through real problem solving that the student can integrate theoretical, practical, self-regulative and cultural knowledge. This is the professional expertise needed in our ever changing environments (Tynjala & Gijbels, 2012). Also, according to Tessaro (2012), problem solving, together with action and the contextual situation, is one of the factors activating competence.

The second main improvement from participation in the meetings is improved relationships between the participants (2nd question). This could be seen as improved team

work, which is another component of the sense of initiative (see European Commission, 2007). The mirror materials and the following discussion were also useful for the students to develop a reflexive attitude. For example, in the third workshop the students were able to realize why their capacity to evaluate their own strengths and weaknesses was different in the two classes. Such a reflexive attitude is considered the main goal of the participation in the workshops (2nd question).

Reflexion is one of the four learning processes at the boundary according to Akkerman and Bakker (2011). The others are identification, coordination and transformation. Interventions focusing on reflexion mostly "emphasize the role of boundary crossing in coming to realize and explicate the differences between practices and thus to learn something new about their own and others' practices" (p. 144). There are two main learning processes involved in reflexion, the first is called perspective making. This is about making explicit one's understanding and knowledge of a particular issue, and can be seen in the students' improved awareness displayed in the posters of the sense of initiative and the ideal work experience, since in both they had to make clear their point of view.

With the multivoicedness in the laboratory due to the different actors, the workshops were genuine boundary crossing meetings. Different points of view enlarge the student's perspective and help them consider the bigger picture (Cárdenas Gutiérrez & Bernal Guerrero, 2011), another noteworthy attitude of the sense of initiative.

The Italian workshops came to the point of envisioning new boundary practices, that is how to institutionalize long work experience, thus aiming at real transformation, the most advanced learning mechanism at the boundary (Akkerman & Bakker, 2011). This was visible in the second last meeting[4]: the group envisioned the future of work experience and modelled it through discussion, an epistemic action of the cycle of expansive learning (Engestrom et al., 2013). The students made many proposals. Some aspects of the new object of the activity (long work experience) were discussed: who to involve; when and for how long to undertake it; how to give continuity to work experience over the school year through school visits. Further meetings would have been necessary to concretize the new model.

[4] The last meeting was not really a Change Laboratory, as the participants had to complete the long questionnaire there was no discussion.

Another issue is the difference in turn taking between the adults (teachers and tutors) and the youth. This could stem from differences in power relationships within the Change Laboratory, as highlighted by Young (2011) in his criticisms of the Change Laboratory. Despite the Change Laboratory being conceived as an encouraging environment where everybody could talk about their ideas and concerns, the people who probably participated the most were teachers and tutors. Some students were shy and did not interrupt much. However, this may not have been as a result of the differences in power relationships, although such differences were of course present. The group was big for a Change Laboratory (up to 20 people) and this could have hampered the opportunities for each participant to make a contribution. On the other hand, only one student wrote that s/he had felt criticized when s/he expressed some concerns; and many students raised important issues over the course of the meetings. Many participants wrote that in the workshops any problem could be discussed (4th question), and the teachers said they had learned to see their students from other points of view (2nd question). Altogether this may indicate that the students felt free to express themselves.

A possible explanation for the difference in contributions is the difference in expertise between the adults (mentors and teachers) and the students. The youth had a lot to learn from them, and their professional identity was still forming. This could have affected their confidence when contributing. Indeed, most of the issues were raised by the same students who were confident enough to make a point and sometimes speak for the rest of the class. Self-confidence is another attitude necessary for the sense of initiative (European Commission, 2006). In the follow up consultation a teacher said that the students improved their self-confidence during the experience as an effect of the Change Laboratory and work experience.

Entrepreneurship teaching

As the students noted in the banner on how to show initiative and the ideal work experience, the mentor must be active and stimulate them. Indeed, the relationship with the tutor is another important aspect of maximizing work experience and nurturing a sense of initiative and entrepreneurship. This could be observed in the building site close to Milan: the researcher and the teacher that accompanied him were impressed by the nature of the relationships between students and work tutors. During the workshops this was called an ‘educational relationship’ because of the effort mentors put into students’

workplace learning: they explained in detail to the students every process they thought was important, and looked supportive and encouraging, thus improving the student's confidence and sense of initiative. Building such relationships needs time, and this could be the factor that points against shortening work experience. According to Ajello et al. (2005) the mentor's function is to reduce the students' unfamiliarity with the work environment, trying to bring the two different realities – school and work – closer. In this regard, the mentors said that during the workshop they realized that the way students and teachers looked at the workplace was different from their own one. As a reducer of unfamiliarity, the tutor carries multiple functions – affective, motivational and cognitive – aimed at improving the interactive processes inside and around the school Ajello et al. (2005). The Change Laboratory workshops were the place where such bridging processes could occur.

It seems that two months is an appropriate length of time for students to settle into the new professional role and for the company to invest in the student. Most companies nowadays do project work which needs time to be implemented, and students should be facilitated in taking part in projects, as they suggested in the posters depicting an ideal work experience. In addition to project work, team work and problem solving are two skills extensively used in work places and that are part of the sense of initiative. This is why the sense of initiative is intimately connected with the workplace, as the participants reported in the first question: problem solving, getting involved, initiating, taking responsibility and being engaged are all essential skills in the workplace. This is why Kozlinska (2012) maintains that, at the first stage, the outcomes for entrepreneurship teaching should be improved employability skills.

According to Engestrom et al. (1995) experts move across boundaries to seek help and instruments wherever they are available, and this is exactly what students have to do to hunt for their learning opportunities. As building sites are not structured learning environments, and the ultimate object of the activity is to make profit, it is up to the student when s/he finishes a task to ask their tutor what needs to be done next, as highlighted during the Change Laboratory workshops. It is up to the student to seek help if s/he has a problem. Of course seizing learning opportunities is important not only in the work place, but also in every domain of life, as highlighted in the 1st open question. Unfortunately, demonstrating this competence in the classroom is problematic, as the

class routine (lectures, written tests and oral examinations) requires compliance rather than initiative.

This experience has been positive not only for the students, but also for the teachers and the school principal, who now acknowledge the importance of the sense of initiative. However, they do not fully realize that this competence could also be taught in the school setting. This is the Zone of Proximal Development for the sense of initiative and entrepreneurship in VET, and will be dealt with in the final chapter.

As reported by the participants in the 1st open question and in the posters, autonomy is of primary importance in developing the sense of initiative. Autonomy is associated with the sense of initiative and entrepreneurship because of the decisional freedom it entails: one has to decide what, how, and when a task will be done (Van Gelderen, 2012). The issue on how to improve autonomy[5] in students in class emerged during the meetings. One teacher suggested autonomy is a personality trait, as it varies from student to student. Another teacher explained how he encourages autonomy in his students. In the fifth year, students are required prepare two projects for his subject. While he gives the goals and deadlines, he does not impose strategies or intermediate steps, so that the students progressively learn how to organize their school related activities. With his students he pretends he is as helpless as an old lady, so that they have to start sorting things out and planning on their own. Some youth are really good at making a plan and sticking with it, others work overnight just before the deadline. In line with this teacher's educational strategy to promote autonomy in his students, Salatin (2011) contends that the teacher from a knowledge supplier should become a learning facilitator.

5.5 The culture of work

The Italian project was composed of workshops plus long work experience, and the latter was introduced for the first time in that school as school work alternation. The next paragraph will discuss the criticalities that emerged in the project in the light of the Italian research on the learning tool called school work alternation. This will also be dealt with in the context of the difficult historical period Italy is going through.

[5] Autonomy here is considered to be connected to the sense of initiative in two ways: as skill, being able to self-organize school or work related activities; and attitude, as self-management (European Commission, 2006).

According to the data collected by Indire (the Italian national institute for documentation, innovation and educational research) from 2006, school work alternation is a widespread methodology in all high schools types: lyceums, technical and professional institutes, institutes of arts and others (Zuccaro, 2011). In the 2011-2012 school year, 44 per cent of institutes in Italy delivered 4,035 school work alternation pathways (3,991 subjects the year before) involving almost 190,000 students, 7.5 per cent of the overall high school population (Zuccaro, 2012). These pathways are mostly provided by (in order of importance): technical institutes, professional institutes, lyceums. The region delivering most school work alternation pathways was Lombardy, which accounts for 34 per cent of the overall figure. The European key competencies considered during the path design were (in order of importance): learning to learn, social and civic competencies, sense of initiative and entrepreneurship (Zuccaro, 2011). According to these statistics the present research is prototypical of the school to work alternation: it was conducted in a technical institute located in the Lombardy region, and it focused on the sense of initiative and entrepreneurship.

Another interesting statistic against which to compare this study, this time at a regional level, is on the outcomes in terms of strengths and weaknesses of school work alternation pathways. The data came from the Lombardy Regional School Office, and concerned the 2008-2009 school year (Pupazzoni, 2009). Among the strengths highlighted, the school work alternation confirmed the synergy between school and enterprises in designing and realizing the path. It also confirmed the students' strong motivation and involvement. A third strength highlighted by the Lombardy School Office, which was not confirmed in this research, was the engagement of teachers and tutors on a didactic and methodological basis. This could have led to an improvement in teaching methods triggering the sense of initiative and entrepreneurship in class, and could be the trigger for further research with the Change Laboratory used for entrepreneurship education.

Among the weakness pointed out by Pupazzoni (2009), there is a lack of integration between school related and work related activities. Also in this research it proved to be difficult to organize an alternative program for the students remaining class. It is also not clear how competencies gained by the students during work experience will be matched with their schoolmates' regular activities and the graduation exam. For instance, it is likely that many topics the students will cover in class have already been tackled in the workplace. Another drawback underlined by Pupazzoni (2009) and confirmed in this

research is the minimal involvement of the whole teaching body. In this project, although the class boards discussed and approved the project before it started, some teachers progressively withdrew their interest and commitment to it. Thus, the involvement of all teachers in the school to work alternation projects will be an aspect for further research; this could be done again with the Change Laboratory toolkit.

Hence, the next project will need to take into account activities for the group of students staying in class which should aim to be as educational as work experience. This could be the topic for a possible Change Laboratory with teachers, work tutors and other stakeholders. A possible solution could be the formative simulated enterprise, considered by the European Commission (2009, p. 23) as a possible methodology for entrepreneurship teaching. The students staying in class could also develop projects for the same companies their schoolmates are working for, and the Change Laboratory could be the right tool to develop this advanced form of learning at the boundary, thus recalling Engestrom's knotworking (2008b). In both cases, the problem of students missing curricular lessons would be overcome.

Provided that there are enough employers, work experience should also be made available to every student who wants to undertake it. Some students think they will go to university therefore they do not have to 'get their hands dirty'. This is part of an attitude that one should work only after having finished studying. This attitude wants the individual only to accept the job they have studied for (see Bertagna, 2010). According to this point of view, a work placement as apprentice surveyor would not be convenient for a future architect or civil engineer. To the contrary, here it is argued that work placement would be good for any kind of student: for the high performing one willing to continue their studies, as s/he can realize the many chances a workplace offers for learning; for the one looking for a job after their certificate; and for the low performing one to catch up with the rest of the class. All in all, this research highlights how the workplace stands as a unique place to enhance one's sense of initiative.

Work experience should be considered a substitute for school lessons and not an addition to it, as was the view held by some of the mentors in the workshops when they suggested moving the work experience to the summer holidays. This is another part of the habit discussed above, and separating the two worlds of work and school. To the contrary, school work alternation should be seen as part of the schooling process and not optional:

in the workplace students learn the same competencies they could learn at school. This is stated in the Italian legislation, which attempts to keep pace with the new centrality given to workplace learning, as underlined by Europe 2020 and stated by documents like *New Skills and Jobs,* or the most recent *Employment Package* recommendations (see Bulgarelli, Centra, & Mereu, 2012).

Another consequence of the attitude contrasting school with work is the simplistic equation: school is about theory and work is about practice. First, many jobs are becoming more theoretical nowadays (Tynjala, 2008). Secondly, the school has changed from teaching content to teaching for competencies. In so doing, knowledge becomes multidisciplinary, relational and context dependant (Ajello, 2011; Costa, 2011; Pellerey, 2011). Thirdly, school work alternation aims for the student to learn the same competencies, either in the workplace or at school.

All the three habits discussed above appear to be part of an idealistic vision of culture and separating school and work (Benadusi, 2011a; Bertagna, 2010; Gentili, 2012b). The Italian curriculum comprises a hierarchy of subjects where the scientific disciplines are considered inferior to the humanities. School tends to ignore the practical dimension of knowledge and the way it can be made operative (Salatin, 2011). Work in general, especially manual work, is considered of less value. Hence, the vocational education provided by the technical and professional institutes is generally considered inferior to education delivered in the lyceums. In the technical institutes technological humanism is cultivated. From a pedagogical point of view, it has the same dignity as scientific and literary humanism (Margiotta, 2007); however, to be appreciated technical humanism calls for an urgent cultural shift. Nowadays, this prejudice is affecting the number of students who enrol in the technical institutes.

Gentili (2012a) contends that it is technical training which backed the economic boom of the 1960s and could therefore promote growth in the current environment. As a consequence of the economic crisis, it appears that Italian schools are becoming more aware of the need to bring the formative chain and the productive chain closer together. The new educational policies in Italy aim at promoting the principle of a formative alliance between school and enterprise at a local level (Salatin, 2011). School work alternation has to be seen in the light of such an alliance, and in this project this has proved to be

successful. Entrepreneurship education within school work alternation is also important as a tool for both the individual and the country's economy growth (Ugolini, 2012).

To be attractive VET should be work based and directed toward local enterprises' needs (Bulgarelli et al., 2012). When offering smart and concrete forms of introduction to work, Italian schools should seek to find a balance between giving the student the possibility of obtaining a qualified job after their diploma, as well as building general formative proficiencies, thus shaping scientific minds (Visalberghi, 2011). Work experience must not be reduced to skills drilling or a field check of school knowledge. To the contrary, it must be conceived as a powerful tool to develop competencies characterizing one's professional profile. Hence, work experience undertaken in a specific enterprise setting becomes a matter of collective reflexion and elaboration at school (Mengoni, 2012), as it was done in the Change Laboratory workshops in Italy.

The reform of the technical institutes and apprenticeships, the creation of professional technical poles as well as the scientific technical committees, and the new school paths delivered by the ITSs (Superior Technical Institutes) are a step in this direction. The ITSs look particularly promising as these schools deliver a highly specialized post diploma technical education comparable to the Australian TAFEs, and for the first time in Italy present a competitor to the university option[6].

With the educational reforms cited above the Italian regulator aims to catch up with the most developed European countries. In so doing, Italy hopes to fill the gap between school and work, thus giving more job opportunities to young people, and the highly skilled technicians industry badly needs, and so to eventually recover from economic crisis. This will be possible when culture and work are considered the same thing.

In this respect, Bertagna (2011) proposes that every student by the age of 18 should gain a VET certificate and be able to work as craftsman or tradesman. Only by doing so would the paradigm separating general and professional culture in Italy be overcome, and every student would have a positive attitude towards manual work. Similarly, this research suggests that long work experience should be mandatory for every high school student regardless of the type of Institute or Lyceum they are attending; regardless of whether they want to continue to University or get a job after their certificate.

[6] The courses started in 2012.

This chapter drew conclusions regarding the Italian project. The Change Laboratory is a viable tool for teaching entrepreneurship through collective reflection on work practices and real problem solving. Knowledge, skills and attitude connected to the sense of initiative are enhanced in the Change Laboratory. In addition, such reflection generated a shared concept of the sense of initiative which was put into practice in the workplaces.

Moreover, the school should embed entrepreneurship into the curriculum, so that teachers are able concentrate on it with project work, real problem solving in team work, and seizing opportunities. The ultimate goal would be teaching the students autonomy.

In Italy there is an attitude that sees study and work as separate and considers the second as not valuable. To address this issue every student regardless of the school they attend and their intention to continue to university should undertake long work experience.

Questo capitolo ha mostrato i risultati della parte italiana dello studio. Il Change Laboratory è uno strumento indicato per l'insegnamento dell'imprenditorialità attraverso la riflessione collettiva sulle pratiche lavorative e sulla soluzione di problemi reali: attraverso il lavoro svolto durante il Change Laboratory gli studenti hanno potuto incrementare le conoscenze, abilità ed attitudini connesse al senso d'iniziativa e d'imprenditorialità; inoltre, la riflessione collettiva ha generato un concetto condiviso sul senso d'iniziativa che è stato poi messo in pratica sul posto di lavoro.

La scuola dovrebbe incorporare l'educazione all'imprenditorialità all'interno del curricolo così che gli insegnanti possano concentrarsi sul lavoro per progetti, risoluzione di problemi reali e lavoro di gruppo, nonché a far cogliere le opportunità agli studenti; l'obiettivo finale è quello di insegnare l'autonomia.

In Italia c'è un'attitudine che tende a separare studio e lavoro considerando quest'ultimo di scarso valore; per superare questa dicotomia si propone che ogni studente possa intraprendere lunghi percorsi di alternanza scuola lavoro, sia che abbia intenzione di continuare gli studi ovvero di lavorare dopo il diploma.

6 The Australian Change Laboratory

This chapter describes the Australian part of the research. As was done for the Italian part of this study, this chapter will first provide a historical analysis of how the sense of initiative and entrepreneurship was dealt with in the school before the project began, in order to provide the context of this research. Next it will provide an outline of the six Change Laboratory workshops with the students and teachers. In conclusion, it will describe the reactions in the school after the project ended.

The Australian research project was conducted in the state of Victoria, at a Regional Catholic College located in Melbourne's western suburbs. The class chosen was a Victorian Certificate of Applied Learning (VCAL) class. The VCAL teaches students practical skills as well as literacy and numeracy skills. It is an accredited secondary certificate, but cannot be used to access academic studies. The vocational course was the Certificate III in Childcare jointly delivered by the Catholic Regional College and a Registered Training Organization (RTO), an organization authorized to deliver vocational training. The fifteen Year 10 and Year 11 students in the class went once a week (on Tuesdays) to the Catholic college for the school lessons, and once a week (Wednesdays or Thursdays) to the workplace - a childcare centre

Questo capitolo descrive la parte australiana della ricerca. Analogamente a quella italiana, per fornire il contesto in cui è stata effettuata la ricerca, si parte da un'analisi storica di come il senso d'iniziativa e d'imprenditorialità era approcciato prima che il progetto partisse; successivamente si fornisce un racconto dei Change Laboratory effettuato con i soli studenti ed insegnanti. Nella parte conclusiva si descrivono le reazioni nella scuola dopo la fine del progetto.

La parte australiana della ricerca è stata effettuata nello stato della Vittoria presso un college regionale cattolico situato nella periferia di Melbourne; il corso individuato è una qualifica professionale VCAL (Qualifica di Apprendimento Applicato della Vittoria). Questi corsi impartiscono sia abilità pratiche che competenze relative alla matematica ed alla comunicazione nella madrelingua; ancorché qualifica di scuola superiore, il VCAL non dà accesso a corsi universitari. Nello specifico il corso è frutto di una collaborazione tra un RTO (Ente Formativo Accreditato) e la scuola in oggetto; si tratta di una Qualifica di terzo livello in Cura del Bambino della durata di un anno; i quindici studenti di classe 10ma e 11ma (di 16-17 anni) il martedì andavano al college per le lezioni in classe, mentre il mercoledì o il giovedì

or kindergarten. The Certificate III was delivered according to a School Based Apprenticeship model; in most cases the RTO was able to place students in its child care facilities. Only a few students were able to find their work placement on their own, and this was thought to be difficult: despite the fact that the state of Victoria pays both students and employers, many workplaces do not want to engage apprentices.

Five of the fifteen students in the class chose to participate in the research. The workshops were held from 18th July to 21st August 2012, and were preceded by about two months' observant participation in the class. The researcher was also able to visit the childcare facilities where the participants were doing their apprenticeships, and gather interviews to be used in the meetings as mirror materials. As the centres were scattered around the district, no work tutor or director could come and join the workshops, which were held at the local college. Use of the interviews aimed to bring their point of view, thus multivoicedness, into the meetings.

In the description of the workshops below particular focus will be on the materials collected during observant participation in the class and in the workplaces. This allows the reader to better understand the nature of the Change Laboratory. Additionally, this shows the organizational effort required to set up such meetings. Extensive field research was needed for observation, data gathering and hypothesis making in the participants' activity systems.

si recavano presso un asilo e/o centro per l'infanzia onde espletare la componente di stage. Questa qualifica è inquadrata nell'ordinamento australiano come forma di apprendistato, e nella maggioranza nei casi l'RTO è stato in grado di collocare le studentesse all'interno delle strutture che gestiva; solo poche studentesse hanno potuto trovare da sé la struttura dove lavorare, operazione difficile a dispetto del fatto che negli apprendistati sia gli studenti che le aziende ricevono contributi governativi.

Cinque dei quindici studenti hanno accettato di far parte del progetto; i Change Laboratory si sono tenuti dal 18 Luglio al 21 Agosto 2012 e sono stati preceduti da circa due mesi di osservazione partecipante nella classe. Il ricercatore è stato anche in grado di visitare i centri per l'infanzia dove le studentesse lavoravano ed a raccogliere interviste del personale, poi utilizzate come materiali mirror durante gli incontri. Dato che i centri erano sparsi nel distretto nessun tutor aziendale né direttore di centro ha potuto partecipare ai Change Laboratory tenutisi presso il college; l'uso delle interviste ha inteso portare il loro punto di vista (quindi 'multivocità' - la presenza di molte voci) nei laboratori.

Nella descrizione dei laboratori particolare enfasi è data ai materiali raccolti durante l'osservazione partecipante nelle classi e nei centri per l'infanzia. Questo permette al lettore di comprendere meglio il Change Laboratory, e mostra lo sforzo organizzativo necessario per allestire i laboratori: si tratta di un'estensiva ricerca sul campo che ha come fine

quello di osservare, raccogliere dati e fare ipotesi sui sistemi di attività dove i partecipanti sono inseriti.

6.1 Historical premises: how was entrepreneurship thought of in the school before the beginning of the project?

As was undertaken for the Italian part, and in line with CHAT (see Engestrom & Sannino, 2010), the following is an historical outline of the way the sense of initiative was delivered in the school. This section will first show how entrepreneurship and initiative in general were dealt with in the local school, and will show some specific examples of VCAL Certificates. Lastly this section will introduce the Certificate III in Childcare which is the object of the research.

The way the sense of initiative was made visible in the school was through posters showing employability skills and how they can be improved in school (see picture below).

Figure 6-1. Charter of learning and teaching on the general skills at the local college.

The above picture is headed by the words: "at this college we strive to live, learn and teach together in a community guided by the Gospel values. As a learning community we are committed to a collaborative effort to seek knowledge and develop skills in a supportive environment".

This picture shows some of the components of the sense of initiative, for example engagement on the top right (seizing all learning opportunities, being creative and pro-active, planning the future and working collaboratively with others) and empowerment on the bottom left (taking risks, being an independent learner, establishing goals, acting ethically, being innovative and believing in yourself)[1].

This school has a well-equipped Trade Training Centre (TTC). In Australia it is often difficult for students to work in the industry as the enterprise world is wary of VET in

[1] This picture was also used in the Italian part of the research as mirror material, to show how the Australian school was promoting this competence for lifelong learning.

Schools (Clarke, 2012; Klarke & Volkoff, 2012). TTCs are thought to be a possible solution to this impasse, providing the students with a context where they can learn trade skills. However, as most of the certificates delivered are Certificates I and II (i.e. low level certificates) and the industry does not trust vocational training, students' employability remains poor (Clarke & Polesel, 2013).

Students come to the Catholic College TTC from the network of Catholic colleges and other schools of the district. The researcher was able to visit and observe Certificate II students learning crafts such as hospitality, picture framing and sign-writing. Certificate III in the form of an apprenticeship is only offered to a few students in the school. Unlike Certificate II, in Certificate III work experience in the industry is mandatory. In the TTC this is provided in the form of small businesses which are open to the public: a bakery, a sign making firm, a picture framing shop, and a restaurant opening a few evenings a week. The picture below illustrates an evaluation grid for the employability skills of a Certificate II in Community Services delivered by the Catholic college[2].

[2] This Certificate II was not suitable for this research, as the practicum component was not enough - only two weeks' block work experience over the school year.

Figure 6-2. Certificate II in Community Services delivered at the school. The sense of initiative is made an explicit goal of the curriculum: example of grid used to assess the student's employability skills.

EMPLOYABILITY SKILLS IN COMMUNITY SERVICES

DATE:	NAME OF ORGANISATION
STUDENT NAME:	
ADDRESS:	PH:
	EMPLOYER NAME:
PH:	EMPLOYER SIG

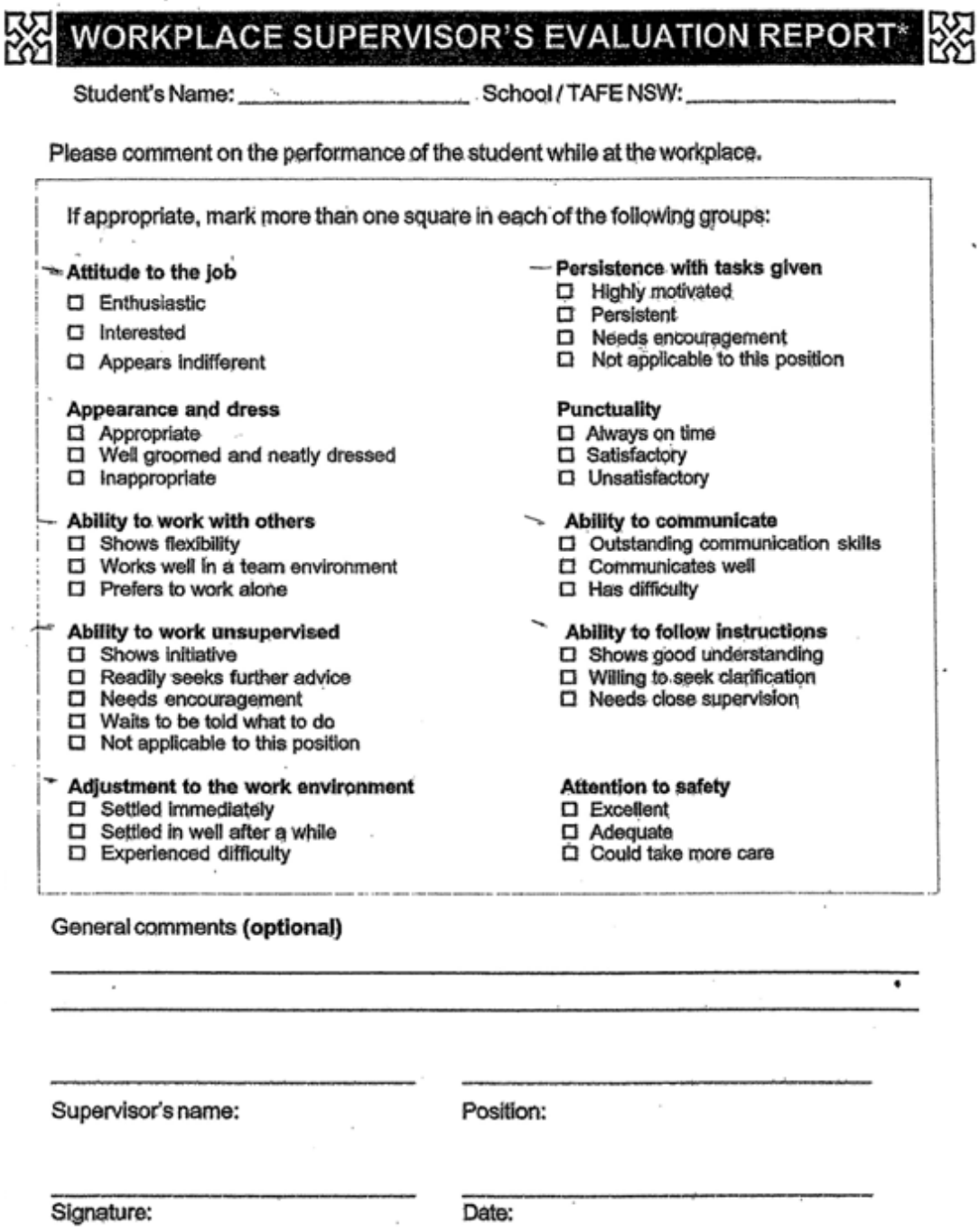
The student has demonstrated the following competencies	HIGH	MED	LOW
Communication			
Listening to and understanding work instructions, directions and feedback			
Speaking clearly/directly to relay information			
Reading and interpreting workplace documentation, such as a safety requirements and work instructions			
Writing to address audiences needs, such as work notes and reports – communicated, but not necessarily written.			
Interpreting the needs of internal/external clients from clear instructions.			
Applying basic numeracy skills to the workplace requirements involving measuring and counting			
Sharing information(e.g. with other staff and possibly with clients)			
Negotiating responsively(e.g. own work role and/or conditions, possibly with clients)			
Being appropriately assertive (e.g. relation to safe or ethical work practices and own work role)			
Empathising(e.g. in relation to others)			
Team work			
Working as an individual and a team member			
Working with diverse individuals and groups			
Applying knowledge of own role as part of a team			
Applying teamwork skills to a specific range of situations			
Identifying and utilising the strengths of other team members – as required in line with identified functions			
Giving feedback			
Problem Solving			
Developing practical solutions to workplace problems(i.e. within scope of own role)			
Showing independence and initiative in identifying problems(i.e. within scope of own role)			
Solving problems individually or in teams(i.e. within scope of own role)			
Testing assumptions and taking context into account(i.e. with an awareness of assumptions made and work context)			
Listening to and resolving concerns relative to workplace responsibilities(i.e. if role has direct client contact)			
Resolving client concerns relative to workplace responsibilities (i.e. if role has direct client contact)			
Initiative and enterprise			
Adapting to new situations(i.e. within scope of own role)			
Being creative in response to workplace challenges(i.e. within relevant guidelines and protocols)			
Identifying opportunities that might not be obvious to others(i.e. within a team or supervised work context and in guidelines)			
Translating ideas into action (i.e. Within own work role)			
Developing innovative solutions(i.e. within a team or supervised work context and within established guidelines)			
Planning and Organising			
Collecting, analysing and organising information(i.e. within scope of own role)			
Using basic systems for planning and organising(i.e. If applicable to own role)			
Being appropriately resourceful(i.e. within scope of own role)			
Taking limited initiative and making decisions within workplace role (i.e. within authorised limits)			

Determining or applying required resources (i.e. with in scope of own role)			
Managing time and priorities(i.e. in relation to tasks required for own role)			
Self Management			
Being self motivated (i.e. in relation to requirements of own role)			
Articulating own ideas and vision(i.e. within a team or supervised work context)			
Balancing own ideas and values with workplace values and requirements			
Monitoring and evaluating own performance (i.e. within a team or supervised work context)			
Taking responsibility at the appropriate level (i.e. within scope of own role)			
Learning			
Being open to learning new ideas and techniques			
Learning in a range of setting including informal learning			
Participating in ongoing learning			
Learning in order to accommodate change			
Learning new skills and techniques			
Taking responsibility for own learning(i.e. within the scope of own work role)			
Contributing to the learning of others (e.g. by sharing information)			
Applying a range of learning approaches(i.e. as provided)			
Participating in developing own learning plans (e.g. as part of performance management)			
Technology			
Using technology and related workplace equipment(i.e. within scope of own role)			
Using basic technology skill to organise data			
Adapting to new technology skill requirements(i.e. scope of own role)			
Applying OHS knowledge when using technology			
Assessors Name:			
Signature:			

This grid illustrates that the sense of initiative and entrepreneurship (as employability skills) is of primary importance and is made a goal of the curriculum.

The observation grid for the Certificate III in Childcare, which is the object of this research, is below.

Figure 6-3. Certificate III in Childcare jointly delivered by the RTO and the school. Observational grid used by the teacher to assess the student's performance in the workplace.



WORKPLACE SUPERVISOR'S EVALUATION REPORT*

Student's Name: _____ School / TAFE NSW: _____

Please comment on the performance of the student while at the workplace.

If appropriate, mark more than one square in each of the following groups:

Attitude to the job
- ☐ Enthusiastic
- ☐ Interested
- ☐ Appears indifferent

Persistence with tasks given
- ☐ Highly motivated
- ☐ Persistent
- ☐ Needs encouragement
- ☐ Not applicable to this position

Appearance and dress
- ☐ Appropriate
- ☐ Well groomed and neatly dressed
- ☐ Inappropriate

Punctuality
- ☐ Always on time
- ☐ Satisfactory
- ☐ Unsatisfactory

Ability to work with others
- ☐ Shows flexibility
- ☐ Works well in a team environment
- ☐ Prefers to work alone

Ability to communicate
- ☐ Outstanding communication skills
- ☐ Communicates well
- ☐ Has difficulty

Ability to work unsupervised
- ☐ Shows initiative
- ☐ Readily seeks further advice
- ☐ Needs encouragement
- ☐ Waits to be told what to do
- ☐ Not applicable to this position

Ability to follow instructions
- ☐ Shows good understanding
- ☐ Willing to seek clarification
- ☐ Needs close supervision

Adjustment to the work environment
- ☐ Settled immediately
- ☐ Settled in well after a while
- ☐ Experienced difficulty

Attention to safety
- ☐ Excellent
- ☐ Adequate
- ☐ Could take more care

General comments **(optional)**

_____

_____

_____ _____

Supervisor's name: Position:

_____ _____

Signature: Date:

Only a few parts of the sense of initiative are taken into consideration: the ability to work unsupervised which could be seen as an indicator of autonomy and self-organization; the ability to work with others; and perseverance. However, given the importance attributed to employability skills in the Australian VET system, it can be seen that the sense of initiative is a goal of the curriculum.

This was the first time the Certificate III was delivered in the school, and the RTO in charge withdrew from delivering it just a few days before its beginning. Consequently, a new RTO took over the course at the last minute, which brought some organizational problems.

When the researcher started field observations in the class it was apparent that students were misbehaving. For example, some would come late to the lessons or not show up at all. Sometimes the girls put their feet on the desk during the lesson[3]. Other students would play with their smart phones or talk and laugh loudly when the teacher or other schoolmates were talking. The teacher asked the students to hand in their completed booklets of competence, and many students had not been able to meet the deadlines. A few students dropped the course while the researcher was doing field research.

The researcher could also observe the formation of sub groups in the class. Students would spent most of their time in those groups and interact with their other school mates. As with the other vocational courses delivered at the college, the Certificate III in Childcare was not only for the students of the school, but also for the youth from the Catholic Colleges network and other schools of the district. As a consequence, when the course began each student only knew, at most, a couple of colleagues who came from the same school. Moreover, a group of girls (the class was entirely female) started a few weeks after the beginning of the course. In the final questionnaire a student who took part in the research pointed out that the position of desks in the room (it was a chemistry laboratory) promoted the formation of subgroups.

There was also negative feedback from the students' workplaces as some of their participation was limited. During field research a student was dismissed by her workplace as she was deemed to be unable to deal with children. Another couple of students refused to undertake work experience as the childcare centre was too far away. As the practicum component is mandatory in these apprenticeships, they risked failing the course.

In summary, the atmosphere in the class did not appear cooperative. This situation culminated in a letter being sent by the RTO's course teacher/coordinator and teacher to

[3] In such cases, the researcher would try to stay neutral and report to the teacher the misbehaviour at the end of the lesson.

the families in May 2012, three months after the course had started. A copy is presented below.

Figure 6-4. Memorandum sent by the RTO to the Certificate III students in childcare during the second term.

MEMORANDUM

To: Students, Parents and Schools

From: [redacted], Children's Services Training Co-ordinator

Date: Monday 14th May 2012

RE: Requirements and expectations of School Based Apprentices

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To all students and parents,

Please find outlined bellow the requirements and expectations of all students currently enrolled as a School Based Apprentice in the Certificate III in Children's Services

1. All students are required to commence attendance at their workplaces no later than this Thursday 17th May and every week thereafter on their nominated day of the week to undertake the mandatory workplace component of this program. Each student has been allocated a workplace. If the student is unable to attend the workplace allocated and has been unable to gain a workplace themselves, then they will be presented with 2 options.
    a. Amend their enrolment, course requirements and fees to a VETis enrolment
    or;
    b. Elect to withdraw from the program if not wanting to continue.
2. Students are required to produce a medical certificate to both the employer and the RTO (TRY Australia) for any non-attendance on days of employment.
3. Students are required to complete the attendance form each day that they attend workplace and this is to be signed by the employer, photocopied and handed in to the trainer each Tuesday in class (with their medical certificate if they have been absent). Attendance forms were given out at the commencement of the course and is also attached. This will need to be back dated if it has not been previously signed.
4. Students are required to attend their workplace for a minimum of 200 hours. With a 7 hour work day this equates to 28 days in the workplace. For all students who commenced the week of the 12th March this will mean completion at the end of October (with no absent days). Students who have commenced work placement at a later date or have been absent throughout the year will have the 2 options to make up their hours.
    a. During term 2 or term 3 school holidays
    or;
    b. Throughout November and December
5. Students are required to actively participate in the workplace to meet the requirements of both the course and their conditions of employment. This means undertaking all tasks requested, interacting with children, learning and following service policies and procedures. Students who are not meeting workplace requirements will be required to attend a meeting with both the employer and RTO co-ordinator to determine action.
6. Students are required to actively participate in the classroom. This means involving themselves in classroom discussion, completing classroom tasks and respecting limits prescribed by the trainer. Students who are not meeting the classroom requirements will be required to attend a meeting with the trainer and RTO co-ordinator to determine action.

7. Students are required to complete all assessment tasks by the prescribed due date. Extensions must be applied for in writing prior to the due date. Work that is to be re-submitted must be done by the date prescribed by the trainer. Failure to complete assessments on time or re-submit assessments on time will result in a Not Yet Competent result for that unit of competency.

All expectations and requirements of this course as outlined above must be met at all times.

If you have any questions or concerns please feel free to contact me.

Kind Regards,

Points 5 and 6 are of particular interest. Apparently, youth were not actively participating in both the school and work related activities. This could be interpreted as a lack of sense of initiative and entrepreneurship. Indeed, it appeared that not all students were happy to be there. The VET coordinator and the career counsellor argued that as the course was a paid apprenticeship, some students enrolled in the program simply to receive a wage, perhaps solicited by their parents, friends or even teachers. It was also discovered that one student's English teacher had suggested she take this course as the student's literacy was poor, and there was nothing much else her student could undertake.

During the interviews in the workplaces, the students' work tutors and childcare centre directors often said "For some girls their motivation is not here". Another problem was the continuous turnover of class teachers: at the time the Change Laboratory workshops began, the students had already changed teachers at least four different times, by the end of the course teachers had changed six times.

The main teaching method in class was the lecture. As the vocational training was delivered in units of competence, each student was given a booklet corresponding to the unit of competence which was being taught. When the school lesson was finished, students had to complete the corresponding part of the booklet, most of the time in class, otherwise at home. All parts of this booklet had to be completed, some of them by the student's mentor. In the booklet, the mentor wrote examples of students' behaviour to show that she had attained the related skill. For example, in August the students were taught about childcare centre regulations. The student's mentor had to write on the students' booklet practical examples of her student being knowledgeable of these regulations in the workplace, such as: "the apprentice follows strictly the sun policy: she puts hat and sun lotion on each child before they go in the garden", "the student treats equally children regardless of their ethnicity"; "the student encourages the child to eat with the spoon". After being completed by the student and her tutor, the booklet had to be handed to the teacher who, together with the course coordinator, certified the

student's attainment of the relevant competence. The entire handover process was the responsibility of the student[4]. As these booklets served to certify the students' attainment, they had to be completed individually. Instead, students often copied the answers of the cloze tests from each other.

With regards to skills related to the sense of initiative and entrepreneurship, group work was not encouraged (students were observed only once doing so), nor was project work. Furthermore, students did not seem to adequately plan their school activities, as only a few managed to hand in their booklets by the due dates.

Although the practical element in the Certificate III in Childcare was present and the RTO provided for the student's work placements[5], the ties between school and work were not strong. The course teacher only went to the workplaces to observe the students once a term. As a childcare centre director pointed out "I saw the teacher only twice, and she was so busy with what she was doing that we could not talk about the problems I was having with my apprentices". Mentors only knew about the topics students were covering in the classroom through the abovementioned booklets.

In summary, apart from the booklets of competence and the rare visits of the course teacher, there was no connection between school and workplaces.

6.2 Outline of the Change Laboratory workshops

The workshops were held at the Regional College once a week (on Tuesdays from 12 pm to 1 pm) from July 17th to August 21st 2012. The regular participants in the meetings were five Certificate III students in childcare, the career counsellor and the RTO teacher/course coordinator. A new teacher and coordinator joined the meeting once. The main tenets of each of the six Change Laboratory workshops will be described in the following paragraphs.

[4] The booklet of competence bridges the student in the classroom, the mentor in the workplace, the teacher and the RTO. As it crosses boundaries, it is a telling example of boundary objects (Akkerman & Bakker, 2011).

[5] During their apprenticeship students would work in two different workplaces to better learn how to deal with different ages groups, from toddlers to pre-school children.

First workshop

In the first meeting, the students completed the base line questionnaire. The goal was to obtain data about the way students, teachers and mentors perceived the sense of initiative. However, as there were other more urgent problems to be discussed[6], there was no time to use it as mirror material. Next, the participants were introduced to the triangle of Engestrom (1987, p.78) and how it can be used to analyse activity. The class lesson was taken as an example of an activity system composed of a community (teacher, students, but also the enlarged community of parents), rules (to respect each other, do not talk when the teacher is talking), division of labour (the teacher teaches, the students listen), instruments (textbooks, computer, booklets); object and sense making (to get the Certificate and learn the trade respectively).

With the help of the students the same triangle was used to analyse the workplaces. For example, in the childcare centre's community there are also parents to be taken into consideration. The division of labour includes: the cook; the teachers organizing the children's activities; the students cleaning up and interacting with the children; the children learning. Some of the instruments used during the activity are play dough, books and building blocks. The object of the activity - the 'raw material' (see Engestrom, 2001b), are the children, and the outcome of the activity is their learning in a safe and healthy environment.

In the second part of the Change Laboratory the students were acquainted with a meeting that took place the week before, involving the VET coordinators of the schools at which students were undertaking the Certificate III in Childcare at the college. The issues discussed in that meeting among VET coordinators were presented during the workshop as mirror material (see table below).

[6] The same questionnaires were utilized during the Italian workshops to raise awareness of this competence.

Figure 6-5. 1st workshop, mirror material. Outcomes of a meeting among the VET coordinators and RTO's teacher/course coordinator. Changes the Certificate III in Childcare would undergo the following year.

Center for
Activity Theory and
Developmental Work Research

Necessary steps to enroll in the Certificate III in Childcare school year 2013

	Pre - requisites	This Year	Next year
1	Information sessions for both parents and their children	No	Mandatory
2	Application Form	Yes	Yes
3	Year 10 voluntary work Experience	Not needed	Better to have some industry experience during year 10, i.e. 1 week
4	Admittance interview	No	Yes
5	Orientation day both in the class and "on the field"	Not needed	Mandatory

During the workshop the course teacher and coordinator who was at the meeting was asked to summarize the outcomes of the meeting, that is the changes in the recruitment process the Certificate III in Childcare would undergo the following year. The teacher explained to the participants that student selection process had become necessary. In implementing a selection process the RTO and the schools aimed to find the students who really wanted to undertake the course and would therefore be committed to participating in it. The process is also aimed at providing families with all the necessary information to make the right choice for their children. One of the main concerns related to the students' and parents' expectations about the course in childcare, "which was not merely about playing with children and babysitting" observed the teacher/course coordinator.

The participants were encouraged to see the new recruitment process with the help of the Engestrom triangle (1987). A problem in the community was identified: this dealt with the recruitment process, that is how to choose the suitable students for the course. Another issue related to the object of the activity: this course had to be undertaken to learn how to be a good child carer and not just to earn money.

The course teacher and coordinator said that although this was the first time she had seen the triangle she already liked it, as one could look at the activity system from

different points of view. This would help broaden vision on the issue and not just focus on one part of it. An example of the rules affecting the activity system was the letter sent at the beginning of the second term to the families indicating what was expected from them. Also in relation to the rules, one student said she found the changing of teachers confusing, for example as one would allow food in the class and another would not.

The new rules to enrol the Certificate III in childcare the following year provided for the RTO and the school to hold a mandatory information session for students and parents. The students were asked their feelings about this new rule, and they said it was a good idea, as when they enrolled they had not been told the criteria and what was expected from them. The RTO and the school wanted families to understand that the course was a School Based Apprenticeship and that involved the student being considered a worker during work placement. The families also needed to know that the workplace provided by the RTO might not 'just be around the corner' and this could raise problems in accessing the workplace by public transport.

A new criterion for enrolment was that previous work experience would be considered favourably. When asked about this matter, the students argued that it had been good for them to undertake work experience in Year 10, as this helped to clarify their expectations of the Certificate III in Childcare. Hence this criterion looked reasonable to them.

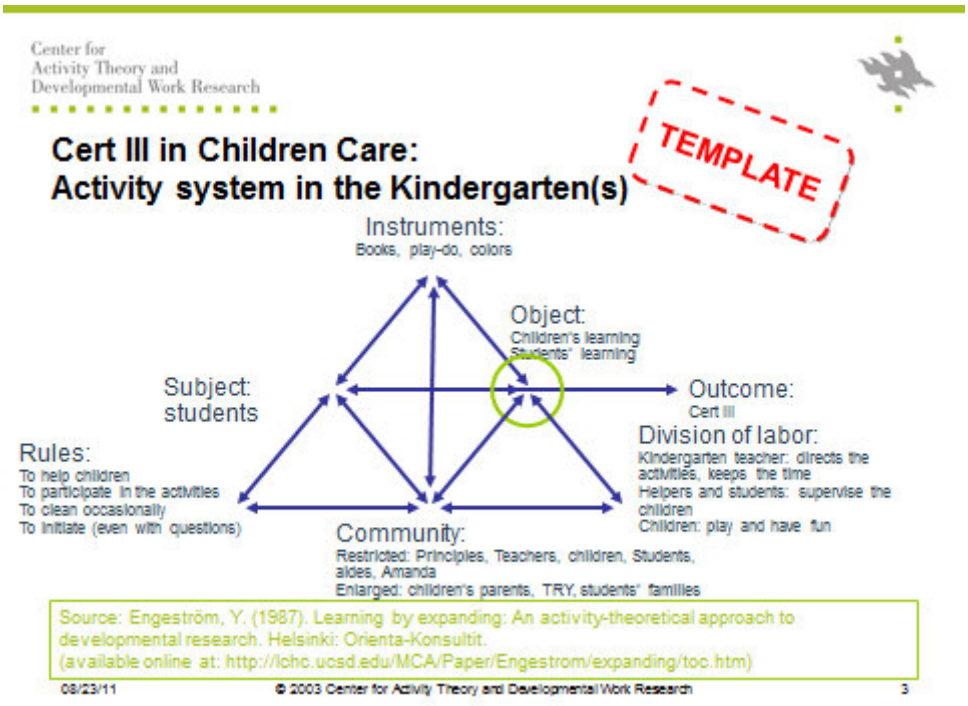
A third criterion, probably the most important one, would be an interview to understand why the student wanted to enrol in the certificate. Examples of inappropriate motivation for enrolment could be: the student just wants to be paid; she was performing poorly at school; or there was not anything else she could undertake. The girls in the meeting agreed with the course teacher and career counsellor that the motivational interview was also a reasonable request. The final thing that could be put in place the following year was a two day orientation just after enrolment, one day in the class and one day in the workplace. This would enable the students to have a clearer idea of the course and what was expected of them.

At the end of the first workshop the students were happy and looking forward to the following one. Their opinions had been taken into consideration for the new recruitment process. They had actively participated in the meeting right from the beginning, possibly because of the small number and the encouraging environment. Also the teacher/course coordinator was pleased as she could collect feedback needed to improve the course.

Second workshop

The first part of each meeting was used to summarize the outcomes of the previous one. As the weeks progressed it was deemed to be important to remind the participants of the main tenets of the previous meeting. Hence in the second workshop the researcher projected the table with the changes the Certificate III would undergo the following year. A schema representing work activity in the light of the Engestrom triangle was also projected to familiarize participants with the triangle of activity as a mediating tool to analyse activity. The slide is presented below.

Figure 6-6. 2nd meeting. Summary of the 1st workshop. The triangle of Engestrom is used to show work activity in the work place seen from the student's point of view.



This slide summarizes the work activity in a child care centre according to the students' point of view (the subject). There are examples of instruments, rules, community, division of labour and object and outcomes which the group discussed during the previous meeting.

Next, the girls raised the issue of what course they could undertake the following year. For the students who would complete their VCAL that year, the RTO would offer a Diploma in Community Services. For the other girls who were in Year 10, that would not be possible as the Diploma does not count towards VCAL, and a solution had to be found together. The

teacher/course coordinator and the career counsellor agreed to look for an alternative to allow for continuation of their path in childcare. All the students were thinking about continuing their studies up to a bachelor degree[7].

After this, the participants listened to an interview with a mentor as mirror material. This interview concerned the motivation of youth going to childcare centres to learn. The interview suggested that if there is motivation, and the student is not there just because 'she was sent by the school', work placement generally is a positive experience for both the kindergarten and the student. A successful apprentice is able and willing to interact with children.

A discussion followed. The participants agreed with the work tutor that having a genuine interest in the child is important for their profession: childcare is not just an office job, one has to want to be there and enjoy the contact with the child. The prerequisite when interacting with children is some knowledge of how to work with them. The teacher/ course coordinator also asked for feedback on the class lessons. The students suggested that there is not enough in class preparation on how to interact with children. They suggested that it would be better to start with the legal part of the course so that they would know what to do in case of problems. The teacher/course coordinator said she did not like to start with the legal part of the course as she thought it was the most boring part. The students said it was not boring, however they suggested group work and posters would make the lesson more engaging. The teacher/course coordinator was happy to receive this feedback.

In this session the cycle of expansive learning (Engestrom & Sannino, 2010) was also projected to show that the group was analysing reality, and that soon they would be able to start thinking about the problems and how to improve the interaction between school and workplaces.

Third workshop

The teacher/course coordinator had taken maternity leave and her job was split into two roles: a new teacher and a new coordinator took over. Nevertheless, the first teacher/course coordinator was so interested in the Change Laboratory and in the

[7]As for the sense of initiative and entrepreneurship seen from a lifelong learning perspective, this discussion was useful as knowing about the available job opportunities is part of the knowledge related to this competence: in order to seize opportunities, the student has know about the available choices.

feedback she was getting from the students that she made an effort to come to the workshop.

The group started the workshop by discussing how the Certificate III in Childcare would be offered the following year, and what course the girls could undertake. Some of the problems discussed included the accessibility of government funding for the girls, whether the Certificate counted towards VCAL, and if the learning packages embedded in the Certificate could also be used in other advanced vocational trainings.

A video of an interview with the RTO's kindergarten director was then shown as mirror material. The first part of the interview relayed the story of a student and the way she had introduced herself the first day of work in the kindergarten. The day before the director had received an email from the RTO's headquarters stating that an apprentice was arriving, and the director felt obliged to take on the student regardless of her motivation to work. On the first day of work the student arrived with earphones in, and she did not take them out even when she went inside the kindergarten. This displayed her lack of interest in her job, as if she had said "I don't care about you". However, when the kindergarten director explained what she was expected to do, she eventually turned out to be a good apprentice.

It was for this reason that the kindergarten manager expressed the desire to interview each possible future apprentice and their parents, to check whether "they really want to be here". She also contended that a similar interview carried out by the RTO would not be enough, as the student had to fit the culture of the specific childcare centre. In the second part of the interview the director called for more cooperation between the school and workplaces. If the staff in the workplace knew what the students were doing in the class, they would follow up on it in the workplace. Lastly, the director said that the students at her centre were showing enough initiative, but more support such as one-on-one tutoring was needed to improve their learning.

There was a discussion amongst participants following the video of the interview. The former teacher/course coordinator said that the childcare centre directors think they "should get above and beyond" the RTO. The problem here, she said, is the need for a consistent process, as not all the facilities would be happy to interview the students and their parents. Further, the childcare centre can decide whether they want to take on a certain student, but "it is not their say" whether the student is admitted to the course. In

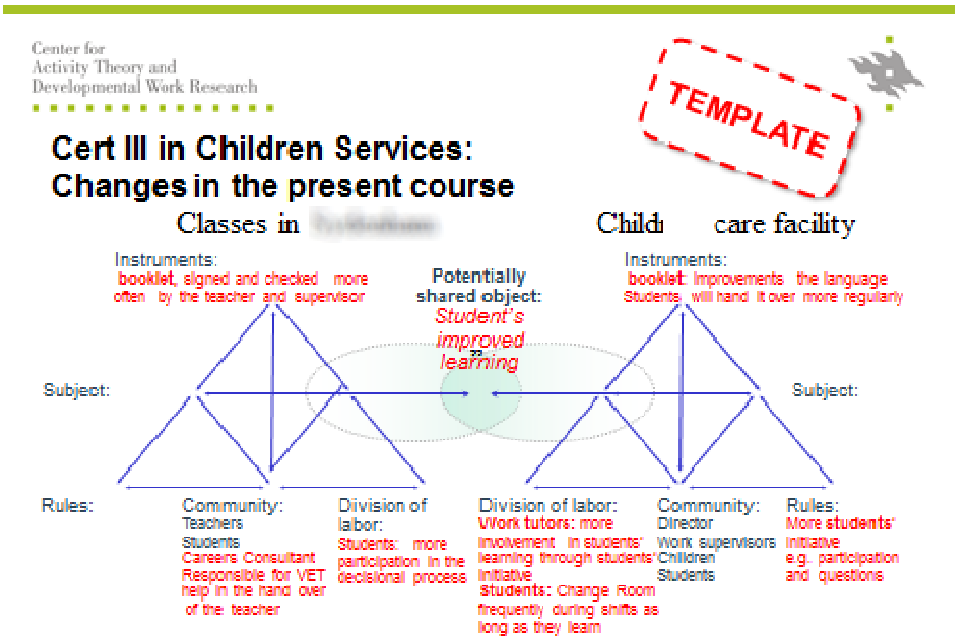
any case, with the orientation day the childcare directors could watch the potential apprentice and give feedback to the RTO, and this would be more than welcome.

According to the former course teacher and coordinator this interview showed how important it is to consider the problem from many points of view. One girl said "This brings us back to the triangle [of Engestrom]". It is important to consider many factors when dealing with problems, and the triangle helps take into consideration rules, community, division of labour, object, tools and the subject's point of view, which facilitates a wider view of the organization. In relation to the detachment between school and work mentioned by the director, the former teacher/course coordinator said that the competency booklet also serves to let the work tutors know what the teacher is doing in the class. Nevertheless, she acknowledged that the handover process could be certainly improved. Sometimes the students fail to pass on the booklet to their work tutors and sometimes the work tutors do not have time to look at it. One student said that the language used in the booklets was too difficult. The former teacher/course coordinator said that this issue had already been worked out by the RTO. She highlighted that the basic idea is that the student is required to show initiative and constantly asks their work tutor to complete the booklet. However, the girls complained that their tutors are sometimes too busy and refuse to look at it. Nevertheless, as the workplaces receive government funding to have students learning there, tutors must find the time to complete the student's booklet.

Fourth workshop

The fourth workshop was the last one that the former teacher/course coordinator was able to attend. After the summary of the previous meeting, the researcher introduced the slide below of two interacting triangles showing how the school and workplace can be seen as two interacting systems of activity, having the student's learning as a possible shared object (Konkola et al., 2007).

Figure 6-7. 4th meeting. School and workplace seen as two interacting activity systems.



The Certificate III was used to contextualize the two interacting triangles. The goal was to have the group looking at all the changes discussed so far in terms of the interacting triangles. For instance, it had been discussed that the booklet was seen as an instrument bridging workplace and classroom. In the class seen as activity system, the careers counsellor was included in the community to facilitate the teacher's handover. In the division of labour of the class, some students were participating in making decisions. In the workplace seen as an activity system it was explained that a greater sense of initiative and entrepreneurship leads to increased participation in the community and thus more learning. The students could show more initiative and be persistent in asking their mentors to complete their booklet (present as a tool in both activity systems), which could then be handed over more regularly to the teacher. The group agreed that the best time to ask their mentor to complete the booklet would be just after lunch, when the children are having a nap.

After having discussed how to show more initiative in the workplace, the students were informed that the teacher who had started the week before would be replaced by a new teacher in two weeks. The former teacher/course coordinator said that changing teachers is normal and positive in the industry, since the RTO wants the best teacher for each subject. Students can thus learn to adapt to different teaching styles. In any event,

the new teacher (who was the current coordinator) would start a new unit of competence, and this would make the transition easier. In so doing the teacher and course coordinator roles would again be the same person.

In relation to the Engestrom triangle, the girls suggested making a clear division of labour between the students and the teacher. For example, the present teacher (the one about to leave) had asked the students what their usual routine was. It was a positive sign that the teacher asked this because although the students had to adapt to the new teacher, the reverse was also true, and the students could be a resource for the smooth handover. It was also agreed that the students were responsible for initiating interactions and contacting directly the coordinator and new teacher. Indeed, a girl had already shown initiative and had written to the course coordinator, and had received positive feedback from her. It was agreed that the following workshop would be used to investigate how to make the handover as smooth as possible. A student emphasized that the former teacher had been particularly sensitive, as she was able to target her teaching to a single student's needs. For example, she gave some students more time finish the class work, and helped other students with learning difficulties.

Fifth workshop

The students were asked how they felt about the change of the teacher, and they said they felt frustrated. Following the previous meeting, the career counsellor asked if they had concerns to relay to the RTO's course coordinator and the VET coordinator in the school. The group started brainstorming and jotting down ideas with the aim of easing the hand over process. The result is shown below.

Figure 6-8. 5th meeting. Brainstorming on how to make the teacher's hand over easier.

N=5.

The students reflected on concerns and suggestions that the career counsellor (as school representative) could relay to the RTO's teacher/course coordinator. When reading this poster, the new teacher was able to know her students better. Indeed, she was a sort of 'newcomer', while the students were much more experienced, having taken part in the school activity system for months by that time: students knew more about the community, division of labour and rules in the class.

The group discussed rules and division of labour. For example, a teacher should have an individualized approach to their students, thus being flexible. She should also be able to create a good relationship and be friendly with the students, not simply an instructor. In summary, in the discussion it was highlighted that there were two different needs when choosing the new teacher. On the one hand the need for the industry to provide the best teacher for each subject. On the other hand, there was a need for the school to ensure continuity[8]: the working relationship between the teacher and students takes time to be

[8] This could be seen as quaternary contradiction that is a contradiction between the different rules of the activity systems (Engestrom & Sannino, 2010).

created. The result was a banner on the ideal teacher. Such a teacher would embody traits from each of the teachers the students had had so far. It was also agreed that the students would show this banner to the newly arrived teacher at the next workshop. Because of its importance the banner is described in the results as a learning outcome of the research.

In the second part of the meeting a video of an interview with an RTO's childcare centre director was played. The students were warned that this interview would contain strong views, and that it was just an opinion which they were not obliged to agree with[9]. This interview was important as four students participating in the workshops were doing their work experience at the RTO childcare centre being discussed in the interview. As they had only worked there for a few weeks, they had not yet been introduced to the director.

In the video the childcare centre director argued that her apprentices (that is the students taking part in the workshops) lacked employability skills: "There are tasks and shifts where the students have to start in time as there is a ratio to be maintained[10]. If a student comes later or leaves before[11] this means that she lacks employability skills. I guess her commitment is not really there".

The students' first reaction was surprise and anger. They argued that the childcare centre was located very far from their homes and as none of the apprentices drove a car, to be there by 7 am they had to wake up at 4 am. This is why the students had asked and obtained permission from the course teacher and coordinator to arrive at 9 am. They argued that after all they were just Certificate III students and had felt they were an 'extra hand': nobody had told them they were 'part of the ratio'. They also felt misjudged by this manager, considering the fact that they had only just started working there and she did not know them. The director did not understand the conflict between the different roles of the girls, sometimes students and sometimes workers. Although she asked for flexibility, one of the girls said, the director was not flexible at all. When the childcare centre director was asked how students could demonstrate their motivation, she said that they should

[9] In the open questionnaire the career counsellor referred to this feedback as inappropriate. Nevertheless, the Change Laboratory is about multivoicedness and dialectics (Engestrom & Sannino, 2010), and this mirror material worked well to mobilize the students' sense of initiative and entrepreneurship.

[10] A ratio is a proportion between educators and children in a room; this is set by law, and the students were part of this number.

[11] The childcare centre opens at 6 am and closes at 6 pm.

show more initiative, for instance by introducing themselves to the other members of the staff or to her.

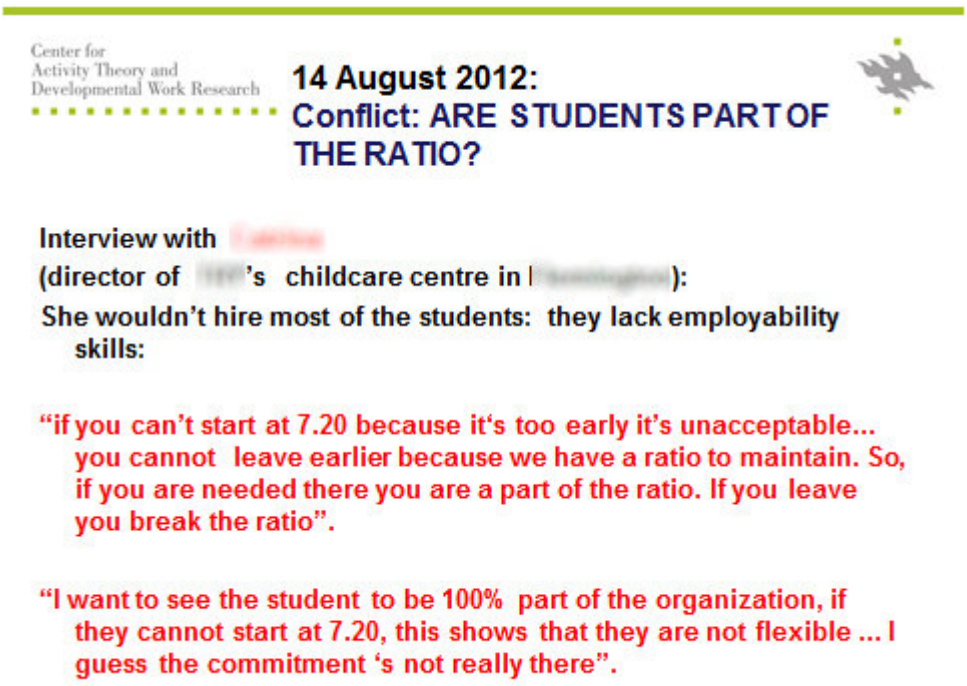
As a consequence of this interview the students added 'clear expectations' to the banner of the perfect teacher. Their participation in the meeting was impressive.

Sixth workshop

During this last workshop the new teacher/ course coordinator joined the meeting. The students showed her the banner describing the perfect teacher. The students used practical examples to explain the banner. For example, they said that the teacher has to want to be with the students, not only teach; she also has to take care of them as human beings. She needs to understand the uniqueness of each student and individualize the lesson and adapt her language to the student's level. Many students like practical learning rather than theoretical lessons, and the teacher needs to take this into account. The students also emphasised the 'ideal division of labour' in the class, recalling this part of the Engestrom triangle discussed over the meetings. The students 'do not have to do everything' and the teacher needs to help them. Finally, the teacher also liaises with the course coordinator and mentors thus bridging the divisions between the school, the workplaces and the RTO.

The new teacher/course coordinator said that as course coordinator she had appreciated the poster and the girls' presentation since she needed feedback to adjust the booklet and what she was doing in the class. The students also asked her questions (related to the last mirror material they had watched) about whether they were included as 'part of the ratio' in their workplaces. The teacher and coordinator said she was not sure and that she would check. After the new teacher/course coordinator had left, the researcher summarized the interview with the childcare centre director the group had watched in the previous workshop using the slide below.

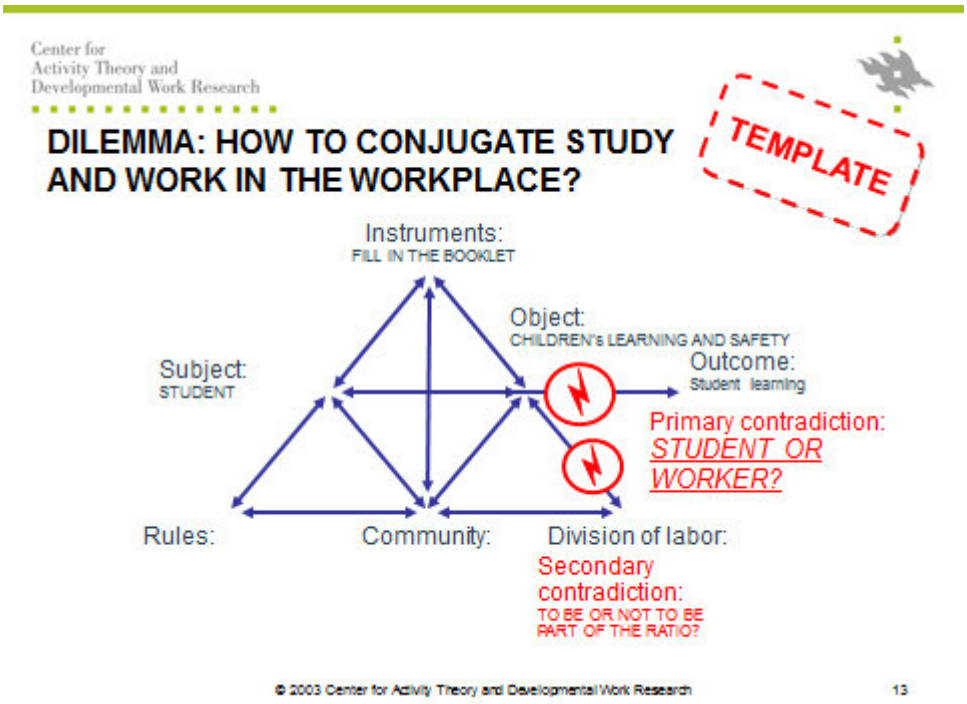
Figure 6-9. 6th meeting, mirror material. Summary of the interview with the RTO's childcare centre director.



The slide presents the director's most controversial sentences, the sentences which were emotionally loaded with anger and triggered dialectics within the group.

The picture below was used to show the group how this problem could be conceptualized according to the Engestrom triangle.

Figure 6-10. 6th meeting. The problem the youth are facing (are they students or workers?) is conceptualized as contradictions in the activity system.



It seemed that here there was a primary contradiction – in Marxian terms it was between the use value and the exchange value of the apprentice. The childcare centre wanted the student to be as productive as the other workers. At the same time, the apprentice was a student and needed to learn. This primary contradiction generated a secondary one in the division of labour of the work activity system, especially in the division of labour: should the student be considered 'part of the ratio' or not?

The career counsellor tried to mediate: she understood that going to the childcare centre was difficult for the girls and that they were just apprentices. However, the students had to understand that when they have a full time job, "the employer will always put everything against you". It will be the girls' responsibility to be on time, to introduce themselves, and to make the communication between them and their boss clear and effective[12].

The girls were then encouraged to jot down their thoughts. The main issue was: are they workers or employees? What are the expectations of them? The students came out

[12] Incidentally, these all seem to be features part of the employability skills.

with a poster about the reciprocal expectations. This is described in the following chapter on the Australian outcomes of the study.

In order to clarify this contradiction it was agreed that communication between the parties was at a premium and the RTO's coordinator should liaise the girls and their childcare centres. Further, a sort of 'performance evaluation' was needed for the girls, so that periodically they would receive feedback from the childcare centre director on how they were doing. The group also agreed that the school VET coordinator should be involved to improve the communication between the classes, the RTO and the workplaces.

After the end of this workshop, the students were eating and chatting in the hall next to the room where the workshops were held and were visibly happy. A student approached the researcher to state her appreciation of the Change Laboratory workshops. She was particularly pleased with the workshops as the students were given the opportunity to express their opinions and work together with the adults to solve common problems. She suggested that the opportunity to participate in the workshops to improve the quality of the courses should be given to more students, both in her class and throughout the school.

This was the last workshop in Australia as the researcher had to leave to conduct the parallel research in Italy. There had been six meetings, but everybody would have been happy to continue. It was agreed that the group would have follow-up meetings after the researcher's return to Australia and see the developments in the issues discussed over the meetings. The final questionnaire on the outcomes of the workshops still needed to be completed.

Follow up to the workshops

After finishing the Change Laboratory workshops in Italy, the researcher returned to Australia. Unfortunately, it was impossible to follow up the students who had participated in the project because the course in childcare had finished. For this reason the researcher had to solicit feedback in different ways. The open answers on the meaning of the sense of initiative and entrepreneurship as well as the Change Laboratory were collected through a telephone interview. The multiple choice answers on the same competence were collected via post or email. The researcher was also able to have meetings in the school with the career counsellor (who had taken part in the meetings)

and the VET coordinator (who had helped a great deal in the organization of the project). The researcher was also able to meet the RTO's manager.

The researcher went to the college to meet the career counsellor who had taken part in the meetings and the VET coordinator who had helped in the preparation of the workshops. They said that during the researcher's absence the Certificate III students had again had a change of teacher and coordinator, as the previous one had to move to Adelaide to direct a childcare facility belonging to the same RTO. They said that the Certificate III in Childcare jointly delivered by the school and the RTO would undergo some changes as a result of the discussion which occurred during the workshops. Most of the suggestions made over the course of the workshops had been put into practice to recruit the most suitable students into the course. Another change was that the Certificate III would be delivered over two years. The first year would be a Certificate II with limited contact with the industry – only two weeks' block work experience. The second year would be a Certificate III delivered two days a week, one in school and the other in the workplace. The main difference would be the type of training contract provided, from apprenticeship to traineeship. This way both Certificates II and III would count as VCAL, and a Certificate IV or a Diploma in Community Services would be possible after Year 11.

According to the VET coordinator and the career counsellor, the Change Laboratory meetings were successful as it was important for the students to receive active feedback, to reflect on how to improve their skills. Students also took responsibility for their own learning and career. The teachers were also happy as the workshops aimed at bringing about positive change. The workshops were positive for the school as well, as teachers could better understand the students' learning needs. Indeed, there were some needs which had to be addressed – for example the school requested that the RTO only have one teacher throughout the entire course.

A week later the researcher was able to meet the RTO's training activities manager to present the artefacts made by the students. The first dealt with their need to have only one teacher (banner of the perfect teacher), while the second was about better understanding of what is expected from them (poster of the mutual expectations). The manager said that the problem of the turnover of teachers had been seriously taken into consideration, and one suitable, stable (this time male) teacher had been found. Looking at the banners, the manager explained that many of the things discussed during the Change

Laboratory workshops would take place in the upcoming school year: information days, motivational interviews, earlier work experience and orientation days both at school and in the workplace. He also highlighted that this Certificate III in Childcare had been delivered for this year for the first time in the school, and his RTO had been asked to deliver it with a couple of days' notice, the previous RTO having withdrawn one week before the course start. A student who took part in the course (but not in the workshops) had also won an award as best VET student of the year. Considering these circumstances the course had been successful. For the following year, he had already collected 22 candidatures.

Incidentally, on the same day the researcher was also able to greet the childcare centre director who had said in an interview (used as mirror in the fifth workshop) that her apprentices lacked employability skills. She admitted that her judgment at that time was inappropriate since the girls had just started and she did not know them. Eventually she had been proud of them for the way they had interacted with both the children and colleagues. After having being interviewed by the researcher, she had reflected on the students' employability skills. She had come to the understanding that the onus was on her to take the first step: introducing herself to the students and making them feel comfortable so that they could do their best. Hence, the director reported that she had invited the Certificate III students to a meeting and had asked if there were any problems and how she could be of help.

In a similar vein to the outcome of the discussion in the workshops, the career counsellor also agreed that it was up to the director to take the first step. In the open questions she wrote that "ultimately, it is the employer's intention as a business owner or manager to get the most out of their staff in order to maintain effective work practices and increase revenue for the organisation. In this case effective child care workers who show initiative are a positive attribute to the team and therefore a welcome addition to the work place".

In relation to the Certificate III in Childcare at the school the following year, the apprenticeship would be turned into a traineeship [13]. The students would not get paid for the work component and have to look for their placement themselves, which would mean

[13] For more information on these type of training contracts see: A guide to apprenticeships and traineeships *(State Government of Victoria, 2011)*.

that they would be scattered around the district[14]. It would therefore be difficult for the class teacher to visit the many workplaces and observe the students interacting with children. In this respect the RTO's training activities manager said "next year most activities will be carried out in class". All in all, the work component would be weakened, which is a detrimental development in terms of the students' employability skills. By way of contrast, in the fifth open question the participants had asked for more cooperation between the school, employers and the RTO.

[14] During this research, the apprenticeship was provided by the RTO and the youth were concentred in few workplaces. This was certainly of assistance in maintaining strong ties between the school and workplaces.

7 What do Australian students think about entrepreneurship?

Similarly to chapter 5 on the Italian results, this chapter will present the results of the Australian part of the project combining work experience, class lessons and Change Laboratory workshops. This chapter will first present the results of the questionnaire given to the participants in the Change Laboratory workshops. This comprises two parts - the multiple choice questions and the open questions. While the first part of the questionnaire was given only to the students to see whether an improvement in the competence of the sense of initiative and entrepreneurship had taken place, the second part was administered both to the student and to the teachers. The aim of the second part was to solicit feedback on the entire project and to investigate the object of the research, the sense of initiative and entrepreneurship. This part of the questionnaire also sought to analyse the meanings attributed to the Change Laboratory. The following section will continue with the description of the two banners created by the students, which is the other source of data obtained during the workshops. One banner concerns the perfect teacher and the other the mutual expectations in the workplace. Finally,

Analogamente al capitolo 5 sui risultati della parte italiana, il presente illustra i risultati della parte australiana del progetto come combinazione di stage, lezioni in classe e Change Laboratory. Si parte con i risultati dei questionari somministrati ai partecipanti dei laboratori; questi sono composti da due parti, le risposte a scelta multipla e le domande aperte: mentre la prima parte è stata data solo agli studenti per vedere vedere se c'era stato un incremento nella competenza relativa al senso d'iniziativa e d'imprenditorialità, la seconda parte è stata somministrata sia agli studenti che agli insegnanti. Lo scopo di quest'ultima parte era quello d'investigare sull'oggetto della ricerca, il senso d'iniziativa e d'imprenditorialità, come pure sul significato dei Change Laboratory. La sezione seguente descrive i poster eseguiti dagli studenti come ulteriore risultato d'apprendimento ottenuto durante i laboratori: uno riguarda la perfetta insegnante, mentre l'altro è sulle aspettative reciproche sul posto di lavoro. Queste diverse fonti d'informazione vengono collegate per trarre conclusioni sulla parte australiana della ricerca. Un’ultima sezione è dedicate alle riflessioni su come migliorare il sistema formativo professionale Australiano.

these sources of information will be brought together to draw conclusions on the Australian part of the research, and some reflections on how to improve the Australian VET system will be made.

Unlike the Italian counterpart, here the final questionnaire was administered three months after the workshops, at the end of the school year. The open questions were completed through a phone interview, while the multiple choice questions were filled out at home and sent via post or email.

A differenza della parte italiana, il questionario di follow-up è stato somministrato tre mesi dopo la fine del Change Laboratory. Mentre le risposte alle domande aperte sono state raccolte attraverso un'intervista telefonica, la parte del questionario con le domande a scelta multipla è stata completata a casa e spedita via email o posta.

(Vedi riassunto a fine capitolo).

7.1 The questionnaires: results of the multiple choice questions

In this section the results from the multiple choice questions in the questionnaire on the 7th European key competence of the sense of initiative and entrepreneurship will be explored. Following the EU definition of competence (see European Commission, 2007), the questionnaire was divided into three parts, each of them dealing with a different aspect of the competence: knowledge, skills, and habits. Each of these features is inspected along with four further dimensions: (1) to what extent the students think they have learned this part of the competence during the project (Change Laboratory workshops, class lessons and work experience); (2) a subjective evaluation of the overall proficiency of the knowledge/skills/habits mostly based on the EQF levels; (3) the importance attributed to the students' professional development. For each of these questions the students stated their perceived level on the basis of four levels. The complete results are in the Appendix. In line with the source of ordinal data, the parameter used to represent the distribution is the median. This is defined as the numerical value separating the higher half of a sample.

The questionnaire was completed by four out of the five students who took part in the workshops[1]. The students were contacted three months after the end of the Change Laboratory and consequently the results reflect their learning over the school year rather than the period they participated in the workshops. Moreover, the questionnaires were filled in at home (mostly on the computer) rather than in the classroom as was the case for Italy. However, the Italian students did not ask any questions when completing the questionnaire in class, and a similar one had been administered at the beginning of the project (in both the settings). Therefore it is unlikely that filling out the questionnaire at home (rather than in the class) had a significant impact on the results.

Knowledge

The table below shows the results of knowledge connected to the sense of initiative and entrepreneurship.

Table 7-1. Students' perception of outcomes of work experience plus Change Laboratory workshops. Knowledge related to the sense of initiative and entrepreneurship.

Knowledge		Improvement over the experience	Perceived level according to EQF levels	Importance attributed for ones' professional growth
1	Services for students in my school	Between a little bit and somewhat	2,5 Between basic factual and facts, principles, processes and general concepts'	Very much
2	Professional Practices at my workplace	Very much	4 Factual and theoretical in broad contexts	Very much
3	Job opportunities and constraints	Somewhat	4 Factual and theoretical in broad contexts	Between somewhat and very much
4	Available job opportunities once graduated	Very much	4 Factual and theoretical in broad contexts	Very much
5	Social and moral role of the industry area	Somewhat	4 Factual and theoretical in broad contexts	Very much

Australia N=4

The rows on the left of the table list five areas chosen to represent knowledge: services for students in the student's school, professional practices, job opportunities and constraints in their workplace, available job opportunities once graduated, and the social

[1] One student underwent a complex surgery, and while she was happy to answer to the open questions via telephone interview, she was unable to complete the multiple choice answers.

and moral role of the industry area. The columns in the table are: the degree of improvement during the two months' experience (from "not at all" to "very much"); the perceived level on the basis of statements directly linked to the EQF model (from level 2 to level 5); and finally, the importance attributed to this competence (from "not important" to "very much") for the students' professional development. For each of these questions the student had to state their perceived level on the basis of four grades.

Overall, since the beginning of the research, the students had gained a very good understanding of the professional practices at their workplace as well as of the available job opportunities once they graduated. They would rate most of their knowledge at an EQF level 4 - factual and theoretical in broad contexts. The knowledge related to the sense of initiative was thought to be very important for their professional growth.

On analysis, the students gained some understanding of the services for students in their school (between a little bit and somewhat). They also knew more (somewhat) about the job opportunities and constraints at their workplace as well as more about the social and moral role of the industry area. Further, they claimed they knew much more (very much) about the professional practices at their workplaces and the available job opportunities once they graduated.

In relation to their perceived EQF level, the students mostly classified their level of knowledge connected to the sense of initiative and entrepreneurship at level 4 – factual and theoretical in broad contexts within a field of work or study. This was true for the following matters: professional practices at the workplace, job opportunities and constraints, and available job opportunities once they graduated. For the services for students in their school, students compared their knowledge to an EQF level 2.5, that is between 'basic factual' and 'of facts, principles, processes and general concepts'.

In relation to the importance for their professional development, the knowledge connected to the sense of initiative and entrepreneurship was perceived as very important. Only the knowledge related to the job opportunities and constraints was considered by the students to be between somewhat and very much important.

Skills

The table below illustrates the results of the questionnaires regarding the skills related to the sense of initiative and entrepreneurship.

Table 7-2. Students' perception of outcomes of work experience plus Change Laboratory. Skills related to the sense of initiative and entrepreneurship.

	Skills	Improvement over the experience	Perceived level according to EQF	Importance attributed for ones' professional growth
1	Project Work	Between somewhat and very much	4 On my own	Very much
2	Plan	Between somewhat and very much	3 Under supervision but I make some decisions	Very much
3	Problem solving	Somewhat	2 Under supervision but doing it with my supervisor	Somewhat
4	Communicating my ideas	Between somewhat and very much	4 To solve specific problems	Very much
5	Negotiate a solution	A little bit	3 To solve problems applying basic methods	Somewhat
6	Teamwork	Very much	4 I actively participate	Very much
7	Self-organize school and work activities	Very much	4 On my own	Very much

Australia (N=4)

The rows present the seven skills chosen to represent the sense of initiative and entrepreneurship: project work, planning, problem solving, communicating (new) ideas, negotiating a solution, team working, self-organizing school and work related activities. The columns contain: the degree of improvement during the two months' experience (from 'not at all' to 'very much'); the owned level on the basis of statements linked to EQF (for questions 1,2,3 and 7 from level 1 to 4; for questions 4,5,6 from level 2 to 5); the importance attributed to the relative skill (from 'not important' to 'very much') for one's professional development.

In summary, the students thought that over the experience there had been an improvement in their teamwork and self-organization, but not in their ability to negotiate a solution. They would rank most of their abilities (such as project work, communicating their ideas, teamwork and self-organization) at an EQF level 4 – 'good to generate solutions to specific problems'. Most of these skills are considered to be very important for their professional development.

The skills the students thought they improved the most over the experience were teamwork and self-organization of school and work related activities. Project working,

planning and communicating new ideas were the second most improved skills, they improved between very much and somewhat. The students thought that their problem solving abilities improved somewhat, whereas negotiating a solution improved only a little bit.

Concerning the students' perceived level of skills according to the EQF level, students thought that they could communicate their ideas, project work and team work at level 4, that is a 'range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study'. The skills related to negotiating a solution and planning are ranked on an EQF level 3, i.e. a 'range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information'. This level should probably be the recommended learning outcome for a VCAL Certificate III. The youth thought that their problem solving abilities were not so strong; these were only placed on EQF level 2 – 'basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools'.

In relation to the importance of these skills, most of them (such as project work, planning, communicate ideas, teamwork and self-organization) were considered to be very much of value, while problem solving and negotiating a solution were considered to be somewhat of value.

Habits

The table below shows the results of the questionnaires concerning the habits related to the sense of initiative and entrepreneurship from the sample of four Australian students.

Table 7-3. Students' perception of outcomes of work experience plus Change Laboratory. Habits related to the sense of initiative and entrepreneurship.

Habits		Improvement over the experience	Perceived level	Importance attributed for ones' professional growth
1	Self confidence	A little bit more	Good	Very much
2	Creativity	Much more	Good	Very much
3	Take the initiative	Much more	Excellent	Very much
4	Risk taking	A little bit more	Good	Somewhat
5	Perseverance	Between like before and a little bit more	Good	Somewhat
6	Resourcefulness	A little bit more	Good	Between somewhat

				and very much
7	Self-management	Much more	Between good and excellent	Very much
8	Judge my own strengths and weaknesses	Between like before and a little bit more	Good	Very much

Australia (N=4)

In the rows on the left the table lists eight indicators chosen to represent the habits related to the sense of initiative and entrepreneurship: self-confidence, creativity, taking the initiative, taking risks, perseverance, resourcefulness, self-management and capacity to judge own strengths and weaknesses. The results of the three dimensions related to these habits are in the columns, showing the degree of improvement during the two months' experience (from 'less than before' to 'much more') as well as the levels the students thought they were at. As the EQF model does not report levels of attainment for habits, values spanning from 'not existent' to 'excellent' were used. The last column contains the importance attributed to this competence for the student's professional growth (from 'not important' to 'very much').

In short, the students acknowledged that they improved habits like creativity, initiative taking and self-management during the experience. They rated their self-management and especially their initiative as excellent. Most of these attitudes were considered to be very important for their professional development.

In detail, the students thought they very much improved in creativity, taking the initiative and self-management. They improved 'a little bit' their self-confidence, risk-taking and resourcefulness. They gained between 'like before' and a 'little bit more' in perseverance and judging their own strengths and weaknesses. As for their perceived levels of habits, they said that they were excellent at taking the initiative and between excellent and good at self-managing. They also believed that their self-confidence, creativity, risk taking, perseverance, resourcefulness and their capacity to judge their own strengths and weaknesses were good. Concerning the importance of the habits for the students' professional development, self-confidence, creativity, taking the initiative, self-management and judging own strengths and weaknesses were considered very important. Resourcefulness was considered between 'very much' and 'somewhat' valuable, while risk-taking and perseverance were rated as being 'somewhat' valuable.

Summary of knowledge, skills and habits related to the sense of initiative

The table below summarizes the data gathered from the students in terms of overall knowledge, skills and habits related to the competence of the sense of initiative and entrepreneurship over the experience.

Table 7-4. Students' perception of outcomes of work experience plus Change Laboratory. Medians of knowledge, skills, and habits related to the sense of initiative and entrepreneurship.

Medians	Improvement in the two months' experience	Perceived level	Importance attributed for ones' professional growth
Knowledge	Somewhat	4 EQF	Very much
Skills	Between somewhat and very much	4 EQF	Very much
Habits	A little bit more	Good	Very much

Australia (N=4)

According to the medians of the data gathered, the students thought that there had been an improvement in their competence related to the sense of initiative. Their knowledge had somewhat improved, while their skills had increased between somewhat and very much. There had also been a small improvement in the habits. As for the perceived level of competence, the youth thought their knowledge and skills were comparable to an EQF level 4, which means exercising 'self-management within the guidelines of work or study context that are usually predictable, but are subject to change'. Also they had a good perceived level of entrepreneurial habits. Lastly, the knowledge, habits and skills connected to the 7th European key competence were all considered to be very important for their professional development.

7.2 The questionnaire, results of the open questions

This part of the chapter will present the results of the five open questions at the beginning of the questionnaire. The answers are important in discovering the way participants value and signify the sense of initiative and entrepreneurship, the Change Laboratory and the overall experience. The first question sought to investigate the participant's definition of the sense of initiative and entrepreneurship. The following three questions (numbers 2, 3 and 4) enquired about the Change Laboratory workshop. Question number 2 concerns what the student gained from participation in the workshops. The following two questions (numbers 3 and 4) are based on the SWOT matrix, and

investigate the advantages and disadvantages of the Change Laboratory. The fifth question asked for suggestions of how to improve the Certificate III in Childcare jointly delivered by the school and the RTO.

All people participating in the Change Laboratory responded to the open questions: five students, the teacher and the career counsellor. The questionnaires were administered mostly via phone interview a few months after the end of the workshops, in November 2012, with the researcher jotting down the answers. Only the career counsellor answered via email. The Australian participants thus had less time than their Italian counterparts to answer the questions; nevertheless their responses are equally rich.

The answers were transcribed into a table together with the Italian answers and put inductively into categories where possible for both the settings. It should be noted that as the answers were open, each person could respond with one or more sentences. As a result, it is possible that each response (or part of it) falls into two or more categories. Hence, the overall number of answers is more than the total number of respondents, and during the following description it will be stressed that the figures listed are answers and not respondents. This should be considered a source of richness rather than a problem. As for the Italian part of the research, in most of the tables the answers are separated according to the role of the respondents (students or teachers)[2].

Question 1: what do you think the sense of initiative and entrepreneurship means?

The first open question asked participants to define the sense of initiative and entrepreneurship. The table below reports the results.

[2] The career counsellor is counted as teacher.

Table 7-5. Open question inquiring about the sense of initiative and entrepreneurship

1) What do you think the sense of initiative and entrepreneurship mean?				
Dimension		Teachers	Students	Total
Agency	Readiness: doing something that needs to be done without being told	1	3	4
	Getting involved (take on a role)		3	3
				7
Creativity	Turning ideas into action		1	1
With whom?	Being able to carry out tasks autonomously	1	2	3
	Cooperating with others, participating	1		1
				4
Where?	In the work place	1	2	3
	Anywhere	1		1
				4

Australia (N=7). The answers were reduced into categories.

In the first column on the right five possible dimensions have been identified by the researcher as second order categories by which to group the first order concepts (in the second column).

Overall, the participants thought that the sense of initiative dealt with agency and autonomy in the workplace.

The first two dimensions concern the core of the sense of initiative and entrepreneurship. In the first dimension are responses related to the participants' *agency* (as the state of being in action or of exerting power): readiness to do something that needs to be done without being told and getting involved (in the sense of getting busy). The second dimension deals with creativity, i.e. turning ideas into action. The other two dimensions characterizing this competence are situational, concerning responses to questions which ask 'who' and 'where'. Hence, this competence can be mobilized either autonomously or cooperating with others. It can be put into action in the workplace or everywhere in life.

It is interesting to note that the majority of the answers (7) saw the sense of initiative and entrepreneurship as agency, and only one participant referred to creativity. The dimension of autonomy exceeds the dimension of working cooperatively (3 against 1). Most of the answers (3) thought that this competence should be mobilized in the workplace, and only one said 'anywhere'.

The next three questions concern the Change Laboratory.

Question 2: what do you think you have gained from the participation in the Change Laboratory?

In this question, the participants were asked what they believed they gained from participation in the workshops. The table below reports the results.

Table 7-6. Open question inquiring about the gains from the participation in the Change Laboratory.

2) What do you think you have gained from the participation in the Change Laboratory? (that is, in the meetings)?				
Dimension		Teachers	Students	Total
Reflexive attitude (Better Understanding)	of the points of view of the other parties	1	4	5
	of the work practices	1	2	3
	on how to bring about positive change	1		1
				9
Improved communication	feed back	1	1	2
	relationship among the parties (cooperation)		1	1
				3
More agency	Stating my ideas, participating actively in the meetings		1	1

Australia (N=7). The answers were reduced into categories.

In short, participation in the Change Laboratory workshops engendered more reflexive attitudes and improved relationships among the parties.

Drawing on the Italian questionnaire that had been administered earlier, the question in English made it clear that the Change Laboratory is represented only by the workshops. Three broad categories were inferred from the answers, they are represented in the first column on the left of the table above. The first gain from participation in the workshop was a reflexive attitude, which means better understanding of: the other parties' points of view, the work practices and how to trigger positive change. A second benefit related to improved communication: more positive feed-back and better relationships among the parties in term of cooperation. The last gain was represented by an improved *agency.* This is because the participants learned how to better state their ideas and take part in the workshops.

The most prevalent gain from the Change Laboratory was a positive reflexive attitude, which appeared in 9 responses. The second most prevalent benefit was better communication (3 answers) followed by improved agency (1). It is interesting that teachers' and students' beliefs were equally distributed throughout the categories.

Question 3: what do you think the strengths of the Change Laboratory are?

In the third open question participants were asked to think about the advantages of the Change Laboratory. The table below reports the results.

Table 7-7. Open question inquiring about the strengths of the Change Laboratory

3) What do you think the strengths of the Change Laboratory are?				
Dimension		Teachers	Students	
Factual	Active feedback from the parties	1	2	3
	Improving the program		2	2
	Improving the students' skills		1	1
				6
Relational	Working together to solve problems	1	1	2
	Putting forward their own ideas		2	2
	Any person can participate		1	1
	Any problem can be discussed		1	1
				6

Australia (N=7). The answers were reduced into categories.

In summary, the participants said that the strengths of the Change Laboratory were both factual and relational.

For the other questions, and echoing Bales' analysis interaction process (1950)[3] during group work, two categories were drawn. The first was called 'factual' in the sense of concrete, practical. The second was named 'relational' to emphasise social relationships. The factual benefits of the Change Laboratory included that it provided the participants with active feedback from the parties; it allowed the improvement of the training program and contributed to enhance the student's skills. The relational strengths of the workshops included that the participants said they worked together to solve problems and helped put forward ideas. Any person could participate and any problem could be discussed. In this group there were an equal number of responses (6) for each of these two categories.

Question 4: what do you think the weaknesses of the Change Laboratory are?

The fourth question dealt with the downsides of the Change Laboratory. The table below presents the results.

[3] With his analysis of group work Bales aimed to distinguish two types of leadership: task-oriented and socio-emotional.

Table 7-8. Open question inquiring about the weaknesses of the Change Laboratory

4) What do you think the weaknesses of the Change Laboratory are?		
I do not see any downside		4
Organization	Not enough meetings, not organized consistently (2)	7
	It is only an experimental project, not a part of the routine available for all the students (5)	
Participation	Not many of the students in the class would take part in the project and did not participate in the meetings (3)	
	The students felt they could not say everything (1)	4
Characteristic of the Change Laboratory	Sometimes the feedback (provided by the mirror) was wrong or too rough	1

Australia (N=7). The answers were reduced into categories.

Overall, most of the issues related to the organization of the meetings rather than the meetings themselves. Another set of weaknesses dealt with participation issues. However, some participants did not see any downsides.

The answers were classified according to three groups of issues. The first category accounts for organizational issues (seven responses). The students said that as this was just a research project, it is not normally available for all the school students. Another criticism was that there were not enough meetings and they were not organized consistently over the school year but only for a short period. Secondly, there were downsides connected to participation in the workshops (four answers): not many of the students in the class took part in the project and the students could not feel they could say everything they wanted to. Thirdly, one issue was intrinsic to the Change Laboratory methodology (only one response): sometimes the feedback provided by the mirror was inappropriate as too harsh. This was the case, for example, with the childcare centre director's interview in the fifth workshop. However, four responses stated that there were no downsides, as any problems could be discussed during the workshops.

Question 5: how would you improve the Certificate III in Childcare?

The fifth and last question asked for suggestions on how to improve the vocational course in childcare. The results are shown in the table below.

Table 7-9. Open question on how to improve the Certificate III in Childcare.

5) How would you improve the Certificate III in Childcare?				
Dimensions		Teachers	Students	
Classroom	Same teacher throughout the year	1	3	4
	Personalizing lessons according to the student's learning style		1	1
	Different classroom environment so as not to have the formation of small groups		1	1
				6
Registered Trade Organization (RTO)	More support needed for the students	2	2	4
Workplace	Improve cooperation with the employers	2	2	4
Anything, I like the way it was delivered				1

Australia (N=7). The answers were reduced into categories.

As this project involved different organizations for the two settings, this question was analysed separately. Overall, the improvements called for more cooperation between the classroom, the RTO and the workplace.

The answers were classified into three main categories: the classroom setting, the RTO, and the cooperation between school and work. The first category suggested improvements in the classroom, such as: same teacher throughout the year; personalizing the lessons according to the student's learning style; improving the classroom environment to discourage the formation of small groups. The second category suggested improvements in the RTO, and called for more support for the students. The third category suggested improvements in the workplace, where closer cooperation with the employers was called for.

Six answers pointed out the need to improve the classroom arrangements, four called for more help from the RTO and another four suggested more cooperation from the employers. Only one student said she liked the Certificate III exactly the way it had been delivered, and consequently did not have any improvements to suggest. While the classroom improvements were mostly pointed out by the students, the request for more cooperation came from both teachers and youth.

7.3 The banners made by the students

This section will describe two banners made by the students during the Change Laboratory workshops evidencing their sense of initiative and entrepreneurship. The banners were developed in response to a problem students were facing. To make their

voice heard, the students made the banners to show to the new teacher and the RTO's coordinator.

The following paragraphs will first describe the problematic situation which prompted the students to look for a possible creative solution. Next, a description of each of the two artefacts will be provided.

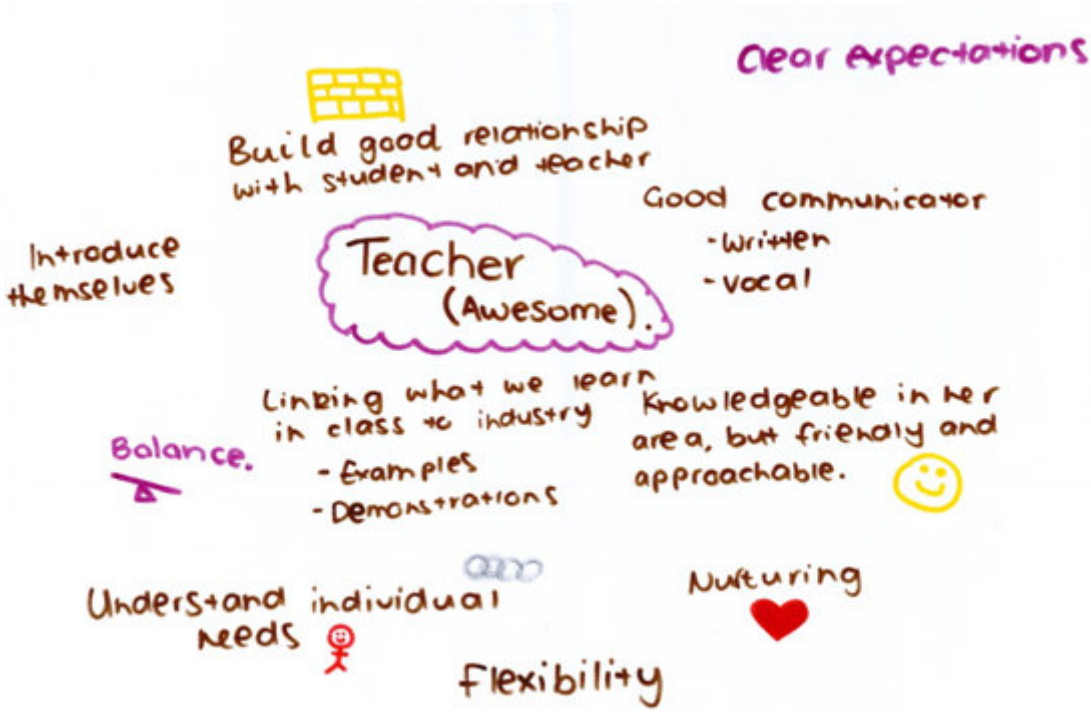
The artefacts are better understood as outcomes of micro cycles of expansive learning. They are the product of two significant processes which occur during the Change Laboratory, the double stimulation and the ascension from the abstract to the concrete (Sannino, 2011a). The first idea, the title of the banner, is the germ cell, which is progressively developed in a more concrete fashion. These are the so-called vertical shifts in concept formation. The horizontal shifts are due to the different actors and points of view.

The artefacts also show the Engestrom triangle as an heuristic tool to analyse work activity (Engestrom, 2000). The triangle has a mediating effect on problems with the principle of double stimulation. The group modified the triangle presented over the sessions to make it mediate the solution to the problem (see Engestrom 2011).

The perfect teacher

This poster was made on 14 August 2012. The former class teacher had already left for maternity and a new teacher had just arrived but was expected to leave in two weeks. The students felt frustrated about this continuous changeover. Encouraged by the career counsellor, they made a poster with the characteristics they hoped the new teacher would embody. At that time the students had been part of the two activity systems for seven months. As a matter of fact, they knew more about the rules, division of labour and tools of the two systems than the new instructor. The intention was to share this knowledge with the new teacher. This work started with a brainstorming session and ended up with creation of the banner below, which was shown to the newly arrived teacher in the following workshop.

Figure 7-1. Poster made by the students during the 5th workshop on the perfect teacher.



Australia (N=5).

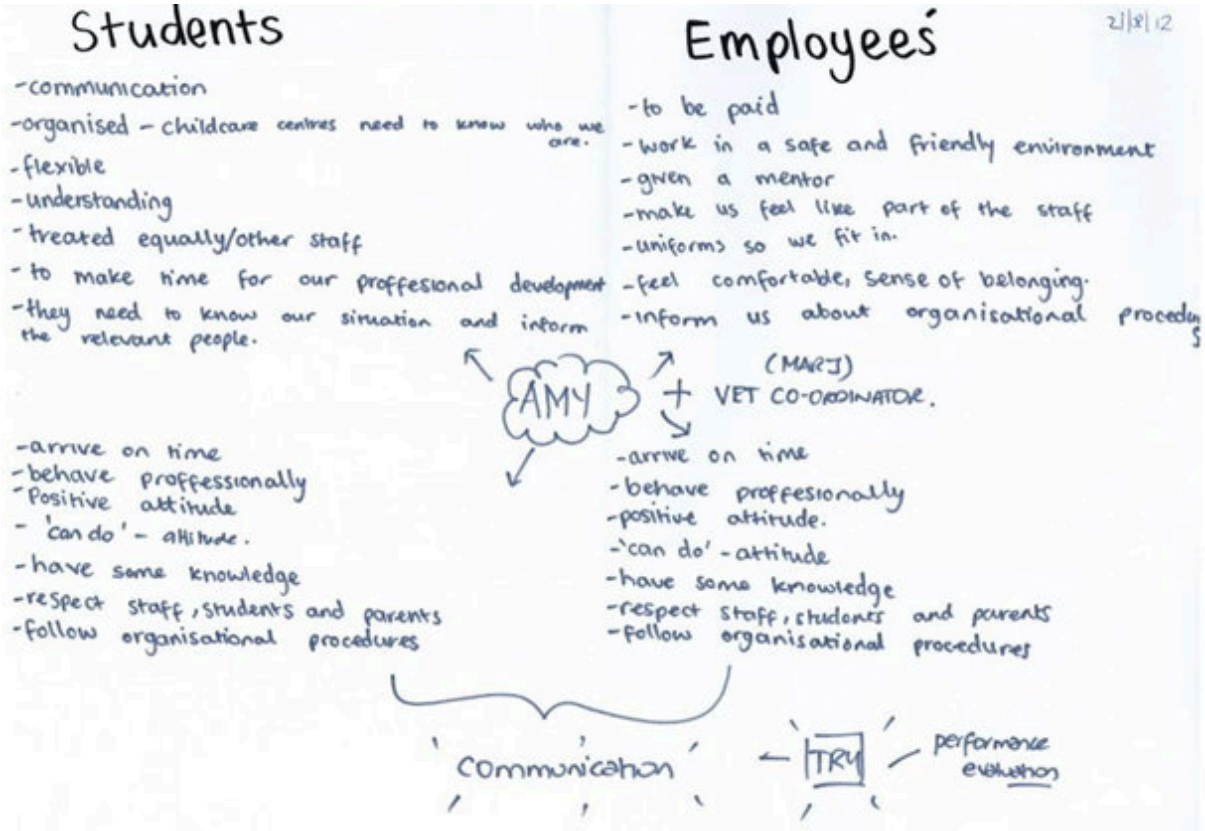
The students used mostly a brown marker with minor symbols in yellow, red and violet to reinforce the main concepts. In the centre of the picture there is the perfect ('awesome') teacher and around the centre there are her main features: introduce themselves, building good relationship with students; good communicator (both written and oral); knowledgeable in her field and approachable (smile), nurturing (heart), flexible and understanding of individual needs (person); linking the industry and the classroom with demonstrations and examples, with balance and with clear expectations. These last words are in violet, and were added by the students after having heard and discussed the interview with the childcare centre director.

Analysed with the Engestrom triangle (1987), this banner represents the school activity system from the teacher's point view - as the students would like her to be. There are signs: oral and verbal communication; tools: linking the industry and the class; rules: introduce themselves, build good relationship; division of labour: clear expectations; community: nurturing and understanding of the individual needs. The contradiction triggering this micro cycle of expansive learning was secondary (between the elements of the system - Engestrom 1996) and dealt with the teacher invoked as a stable member of the community, with clear rules and 'fair' division of labour.

The mutual expectations

This banner was created by the students on 21 August 2012. The students felt upset because a childcare centre director had misjudged their lack of employability skills. From their point of view, she was asking for things to which she was not entitled. Encouraged again by the career counsellor, the students drew the poster below.

Figure 17-2. Poster on the mutual expectations made by the students during the 6th workshop.



Australia (N=6).

The aim of this piece of work was to clarify the expectations and the duties of each party. The main issue the girls were concerned with was whether they are students or employees in the workplace. The general idea was to make the girls' role clearer – either they are seen as students (on the left) or employees (on the right). Their expectations are listed in the top part of the poster, while their duties are at the bottom. The course coordinator's name is in the centre of the poster. The course coordinator is the one who should be in charge of communication among the parties – students, workplace and RTO. While the expectations are different if the apprentice is considered a student or employee, in the end, the duties are the same for both students and employees.

Looking at the top left of the banner, the young people considered that as students they expect from their workplace: communication; organization (the childcare centre needs to know who the students are taking care of); flexibility; understanding. They would also like to be treated equally by the other members of the staff, who also have to make some time for the student's professional development, and need to know the student's situation in order to keep the relevant people informed.

In the girls' role as employees, they expect from their workplace: to be paid and given a mentor; to work in a safe and friendly environment; to be given uniforms and made comfortable, so that they feel they belong to the staff; and to be acquainted with the organizational procedures.

The girls' duties are: arriving on time; behaving professionally; having a positive 'can do' attitude; being knowledgeable; respecting the other staff, students and parents; and following organizational procedures. In the end, the duties are the same whether the girls see themselves as students or as employees.

Lastly, the structure of this banner analysed according to the Engestrom triangle recalls the work activity where the subject is the student. The rules, community and the division of labour are described thoroughly. For example, in the community one can see the representatives of the activity system: students, staff (colleagues, mentors, the director is not mentioned), children, parents.

7.4 Discussion of the results

This section will draw conclusions on the Australian project. It will first summarize the results from the multiple choice answers, open answers, and banners. Next, the section will examine the relationship between the sense of initiative and the workshops. Learning at the boundary has been possible through the artefacts made by the students and reflection on the sense of initiative. Lastly the section will make some observations about entrepreneurship teaching in the school setting.

Although limited by the small number of participants, the results suggest a level of achievement for the sense of initiative and entrepreneurship comparable to an EQF level 4 'exercise self-management within the guidelines of work or study contexts that are usually

predictable, but are subject to change', which is a higher level than their Italian counterparts.

Results of the questionnaires

Taking first the outcomes of the multiple choice answers, students said that they have had a dramatic improvement in their knowledge, skills connected to the sense of initiative and entrepreneurship over the school year, with the skills having improved more than the knowledge and the habits. At the end of the course, they reported their achievements at EQF level 4, exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change. This is a higher level than would be expected for their age and type of vocational education. The entrepreneurial habits also improved, and their level was good. The three parts composing this competence (knowledge, skills, habits) are considered equally very important for the students' professional development.

Of the knowledge related to the sense of initiative and entrepreneurship, over the course of the experience the students learned most about the professional practices at their workplace and the available job opportunities once they graduated. In relation to their entrepreneurial skills, the students improved their teamwork and self-organization. With respect to habits, the students improved self-management and initiative taking. These were all topics which were the object of discussion in the workshops.

When asked about the sense of initiative and entrepreneurship (1st open question), the participants said it was about agency (doing something that needs to be done without being told and getting involved), as well as autonomy in the workplace. The 2nd question inquired about the gains from participation in the Change Laboratory, which were found to be a better understanding (of the different points of views and work practices) and improved communication in terms of feedback and relationships. When asked about the positive aspects of the Change Laboratory (3rd question), the participants said they were both factual (active feedback, improving the program and students' skills) and relational (solving problems together, putting forward their ideas, any person can participate and any problem can be discussed). When asked about the downsides of the Change Laboratory workshops, the participants identified mostly organizational issues (it is only research and will not be repeated) and participation downsides (more students to be involved). The last open question (the 5th question) was on how to improve the program

the following year. Some improvements related to the classroom, others the RTO, and also cooperation between the two.

The Change Laboratory and the sense of initiative and entrepreneurship

The strengths of the Change Laboratory (3rd open question) included being able to improve the program and work together to solve problems. The problems the students faced were real and meaningful for them, and this improved their motivation to find solutions to them. In other words this triggered their sense of initiative. Collective creative problem solving is a key process in the Change Laboratory (Engestrom & Sannino, 2010). Tynjala (2008) also considers problem solving as the mediating process to integrate theoretical, practical and self-regulative knowledge in an integrative pedagogy needed in todays' constantly changing world.

Another positive aspect of the Change Laboratory was the active feedback from the parties. The workshops turned out to be a place where the participants could reflect on their work and school practices through the mirror materials and the consequent discussion (reflexive attitude, 2nd open question). Different points of views helped the students to see 'the bigger picture', another constitutive element of the sense of initiative and entrepreneurship (see European Commission, 2009). Tynjala (2012) would refer to such reflexive attitudes as self-regulative knowledge, one of the four components of professional expertise, the other three being, factual, theoretical and sociocultural knowledge.

In relation to the Change Laboratory and its downsides (5th question), the participants pointed out that the Change Laboratory should be delivered consistently over the year and should have involved more students from the class. Moreover, one student wrote that the Change Laboratory should not just be an experiment: the workshops should be extended to all the school classes, so as to give to many students the possibility to talk about their problems and find possible solutions together. It appears that both students and teachers were happy to participate in the workshops, and the downsides may be seen as an encouragement to repeat the Change Laboratory with improvements, having more sessions, more appropriately distributed over the school year, for instance twice a month. In addition more students should participate in the workshops, as well as some of the work tutors and the RTO's coordinator. The same meetings could be used to discuss the competency booklets and make them capture better the multiple meanings and

perspectives. As these booklets are shared by the many actors (students, work tutors, teacher and coordinator) they are an example of boundary objects. According to the definition given by Akkerman and Bakker (2011, p. 140) "boundary objects are artefacts that articulate meaning and address multiple perspectives. They are organic arrangements that allow different groups to work together". They are therefore useful for the actors who are part of different organizations and are able to make use of the booklet for diverse goals. Because of the multivoicedness realized in the Change Laboratory, the workshops could be an ideal place to discuss and find solutions to improve the capacity of the booklets to capture multiple perspectives and meanings.

Unlike Italy, in Australia there was only a small number of participants. On one hand, this allowed the students to take the lead many times and frequently contribute. On the other hand, the work tutors' absence in the workshops sometimes meant there was a lack of multivoicedness, although this was brought in by the interviews in mirror materials. The school and the RTO progressively gave more value to the meanings attributed by the actors to this research. As soon as the workshops began, the RTO and the college realized how important it is to have a place where the teachers, the work tutors and the students can discuss problems at the boundaries and see them as opportunities to improve the course.

An interesting phenomenon common in Change Laboratory workshops and entrepreneurship teaching is the role of triggering events. According to Heinonen and Poikkijoki (2006, p. 86) "Intention is a necessary but not sufficient condition for entrepreneurship, thus some kind of triggering event is needed". According to these authors, teaching for entrepreneurship requires an event which is able to trigger the students' agency. They suggest that in university students this can be knowledge itself of entrepreneurship. The role of triggering events is also important in CHAT since expansive learning is triggered when the group is faced with a contradiction, thus the need to change the state of things (Engestrom, 2001a). In activity theory, contradictions within and among activity systems are considered a potential source of change. Students as collective agents tried to respond to the contradictions they were faced with, and two triggering events were identified. The first was the continuous turnover of teachers. This can be seen from the Engestrom triangle as a problem in the community: the teacher is not a stable member of the community. The second was the confusion about the students' role in the workplace (are they 'part of the ratio') as highlighted by the interview with the childcare centre

director. Students had to come to terms with the different rules of the activity systems they were part of, being students and employees at the same time. In both cases it was the problems which mobilized the students to work as a group.

The posters as learning outcome at the boundary

In their literature review on learning at the boundary, Akkerman & Bakker (2011) describe four learning mechanisms of which reflection and transformation are the most advanced ones, and often take place during the Boundary Crossing meetings. This is a type of Change Laboratory where the experts from different organizations meet to find solutions to shared problems, and this is the case with the workshops held in Australia. The students were crossing the boundaries between school and work, as did the teacher/course coordinator between the school and the RTO. Multivoicedness was brought into the workshops by the videos of interviews of the work tutors and childcare centre directors. The two banners are the most visible outcome of the Change Laboratory. Some of the learning mechanisms described by Akkerman and Bakker, namely reflection and transformation, can be observed in the banners.

During reflection, for example, perspective making deals with making explicit one's understanding and knowledge of a particular issue. This process is dialogical and creative in nature: taking another perspective is a way to start seeing see things in a different light. In the first banner the students tried to take the teacher's point of view, while in the second they had to think about the employers' point of view. It was remarkable that the career counsellor in the second poster asked the girls to move from one perspective to the other.

The poster on the mutual expectations also demonstrates the fourth learning mechanism at the boundary, transformation, as it seeks to change the boundary practice. The confrontation with the problem concerning the girls in the workplace, who were students and workers at the same time, led to the need to clarify their role first with the career counsellor, then with the teacher and course coordinator, and finally with the RTO course coordinator.

The artefacts are evidence of the students' collective agency and transformative learning aimed at solving the problems they had in school, the workplace, and at the boundaries. The banner of the perfect teacher shows how students were able to turn an idea into action, the essence of the sense of initiative and entrepreneurship. Students had

the idea to make a banner to be shown to the new teacher; thus they were creative. Seen in terms of the double stimulation process, the Engestrom triangle with its composing elements, especially rules, community and division of labour, might have acted as a second stimulus in the mediation of the problem. In other words, the fact that the rules, division of labour, community had been discussed in the previous meetings might have triggered the basic ideas to make a banner where the teacher's role is clarified. The following week the students took the initiative to invite the new teacher to the workshops and explain the characteristics they thought would be beneficial for her to bring to her teaching. Incidentally, the 'awesome' teacher is also able to connect school and work.

The banner on mutual expectations also shows the students' creativity in clarifying what is expected of them (and also their rights) in the workplace as students and workers. In this banner as well it seems that the Engestrom triangle discussed during the meetings has had a role as a second stimulus to make the students think about the division of labour in the workplace. As the triggering event here is the students' alleged lack of employability skills, students could reflect on how to demonstrate these skills in the workplace, for example, have a can do attitude, have a positive attitude, arrive on time, behave professionally, follow organizational procedures, be given a knowledgeable mentor. This is particularly important for this research as employability skills are the first level of learning outcomes for entrepreneurship education (Kozlinska, 2012).

The sense of initiative and entrepreneurship between school and work

It may be argued that reflecting on the sense of initiative during the workshops necessarily involved thinking about how to improve one's learning in the workplace. In an activity system such as the workplace the main goal is not the student's learning, and it is important that the student is able to seize learning opportunities and exploit them. Rarely are students told exactly what to do and how to interact with children. It is up to the student to initiate ('have a go' the participants said in the 1st open question) and see or ask what needs to be done in the workplace. It is up to the student to persist in asking their mentor to fill in the booklets. It is up to the student to ask for constant feedback, which is one of the most important ways to learn. As suggested by the participants in the answers to the open questions, feedback to bring about positive change is one of the main features of the Change Laboratory. Feedback is also provided at school through examinations.

However, in the workplace feedback is provided mostly upon request. Thus, the sense of initiative turns out to be a key competence for learning in the workplace.

During the workshops the students not only reflected on the value of initiating in the workplace, but it emerged from the open questions that in the Change Laboratory students can also see what is happening in other workplaces and understand that they are not the only ones with a particular problem. This could help improve the student's confidence. In this respect, during field observation it was observed that shy students would refrain from interacting with children. This would consequently delay their learning and their sense of belonging to the childcare centre. It is clear why self-confidence is an essential habit of the sense of initiative, as more confident students interact more with children and learn more. This is an example of taking responsibility and the "can do" positive attitude discussed in the meetings and shown in the 2nd banner.

The Change Laboratory workshops have also brought about positive change in an indirect way: the changed relationship between the childcare centre director and the students can be traced back to the interview and the workshops. During the interview, the childcare centre director called for more employability skills from the students – she expected them to make a move and introduce themselves to her. The interview caused her to reflect on who should make the first move, her or the students. During the workshops it was also suggested that the students should not always expect others to initiate things in the workplace, as the employer "will always put everything against you. It will be always your responsibility". Hence, the improved relationships between the director and the students can be related back to the Change Laboratory.

During the Australian research the researcher could see how the competence of the sense of initiative and entrepreneurship and employability skills are tightly connected in students crossing boundaries from school to work experience. The childcare centre director said her apprentices lacked employability skills, and suggested they initiated more. The Australian definition of employability skills for Vocational Education and Training embeds most of the features of the European key competence of the sense of initiative. Authors like Kozlinka (2012) emphasize that employability skills are at the first level of socio economic outcomes for entrepreneurship teaching. There are two further steps, intrapreneurship – that is how to be entrepreneurial within a company, and entrepreneurship as venture creation; however those could be the object of study for

university students. As a first step, students could see the sense of initiative as a competence needed to get a job and be a good employee within a company. Employability skills are considered by employers as very important. Technical skills alone are not sufficient any more for individuals who enter and are wanting to progress in the workplace (Wibrow, 2011).

Thus far it appears that the sense of initiative and entrepreneurship is learned mostly in the workplace, with the Change Laboratory as a place to mobilize agency and reflect on how to put initiative into practice. First, in the first open question the participants said that the sense of initiative was about agency and autonomy in the workplace. Secondly, looking at the multiple choice questions on the sense of initiative, the students' greatest improvements were in their knowledge connected to their work practices and the available job opportunities once they graduated, skills like teamwork or self-organization, and habits such as creativity and initiative taking. These all appear to be related to the workplace and the Change Laboratory. Thirdly, such competence is particularly needed in the workplace to maximize the students' learning, as argued above. The school and the workplace clearly have different attitudes toward the competence on the sense of initiative. While the participants said that the sense of initiative was shown in the workplace (1st open question), in the school this was not required.

Nevertheless, students could be taught how to better take initiative in the school. The role of the career counsellor stands as a possible role model of teaching for the sense of initiative and entrepreneurship. In this instance she was supportive and encouraging of the students, and acted as facilitator of the process, while the students had to come up with ideas to be turned into action. She helped the students realize their personal goals. This could be seen as an example of entrepreneurship teaching as a way to promote the students' autonomy and personal initiative (Cárdenas Gutiérrez & Bernal Guerrero, 2011). The teacher should be able to balance guidance and freedom, and personalize the student's learning (Van Gelderen, 2012), as pointed out by the students in the artefact of the perfect teacher and in the 5th question on how to improve the course. In fact, the students' call for individualized learning was a leitmotif throughout the workshops. Every teacher should act in the class in the same way the careers counsellor did in the workshops.

Reflections on how to improve the Australian VET system

The following paragraphs will offer some suggestions of how to improve Australian VET in schools courses of this kind. As the Australian vocational system is highly varied it is difficult to make generalizations. While some industry sectors - such as nursing or the regulated trades - have strong links with the labour market, other sectors, for instance finance or agriculture, have much weaker links with specific jobs (Wheelahan et al., 2012). These suggestions are intended to promote changes leading to a greater use of the employment logic in VET delivery (see Iannelli and Raffe, 2007). This is to say that, besides giving young people the opportunity to enrol to tertiary studies, the VET system should also aim to provide youth with smooth transitions into industry. It is also important to note that in comparison with other countries Australia has a relatively low number of unemployed youth. According to Tom Karmel (cited in NCVER, 2013) this is explained by two main factors. The first is that there are high rates of post-school education and consequently less youth looking for job. The second is that Australia has a flexible education system which offers individuals multiple opportunities to gain qualifications. These factors will continue to be of importance while the Australian economy remains strong.

It appears that the Certificate III which was the object of this research facilitated a successful transition into the industry for these students. It came to the researcher's attention that some of the students who participated in the research were offered a job and apparently refused as they wanted to undertake a Certificate IV in Community Services. Another student in the course was nominated for an award for the best vocational student of the year. The success of this course was likely due to the fact that it was jointly delivered in the form of an apprenticeship. Being part of the industry, the RTO could provide good teachers and work placement. The course was also delivered as a paid apprenticeship which ensured better links between school and work.

Vocational education in Australia is affected by a considerable number of issues. One of the reasons in Australia it is sometimes difficult to deliver vocational education of good quality is that school-level VET is accommodated within general education. Industry does not believe that VET in schools is of high quality. Although Certificates I and II delivered by schools can assist retention, they are not sufficient for a graduate to access industry and secure a stable job. Thus, many youth with Certificates I and II find themselves employed

in casual jobs. Another issue is that, like in Italy, vocational education is considered a second best education as compared with general education. Consequently, it does not attract the best resources: teachers, funding, students. Since low SES students tend to undertake vocational education, it is imperative for equality reasons that VET is of excellent quality, and measures could be taken to improve it.

First, a larger work-based learning component would help to improve the students' employability. As argued by Stenstrom and Tynjala (2009), the use of work placement as an educational and learning strategy has become one of the most important developments in education. Work placement should be offered where possible in entry level vocational courses such as Certificates I and II. In this research, work placement was provided in the form of one day a week over one year. Some mentors prefer students to undertake block work placement, as one day per week does not ensure enough continuity. One work tutor said: "If the student is off sick and misses one day she comes back after two weeks and she feels like a stranger". Block work placement can ensure better integration of the student into the workplace practices. On the other hand, one day per week seems to ensure a better balance between school and work learning. For example, the student can start observing in the workplace what s/he is learning in the class and vice versa. Perhaps an appropriate balance should be found between the two. Also class lessons could be improved in two different ways. The first would provide students with more theoretical knowledge such as concepts useful to understand better the complexity of their job. The other direction would be more workshops to help mobilize concepts to solve practical problems. Students should undertake project work, thus connecting concepts with real problems, and work in groups. Overall, it is argued that vocational students should spend more time in the workplace and in vocational classes.

As this research shows, collective spaces where students, their teachers and mentors can work together at the boundary and reflect on how to bridge school and work can improve the quality of the training delivered. Teachers and VET coordinators should visit the students in the workplace often to ensure that the practicum component is relevant. As role models for the students, mentors should be involved in the students' training. First, they should be trained on how to facilitate the students' learning by being supportive and encouraging. Second, they should be required to spend more time with their students helping them integrate better into the work environment. Third, they could deliver lessons in the classroom thus contributing to bringing school and work closer together.

In summary, the outcomes of the Australian part of the research found that although difficult to organize, the Change Laboratory was an extraordinary tool for improving the students' sense of initiative and entrepreneurship in VET students in two ways. First, during the workshops the students were faced with different points of view and real problems to be solved creatively in a joint effort. Secondly, thanks to the feedback received during the Change Laboratory, the students cooperatively were able to think about the sense of initiative in terms of employability skills needed in the workplace, in turn maximizing their learning in the workplace and in the classroom. It has also been argued that teaching for entrepreneurship at school requires a shift in teaching practices.

Per riassumere, i risultati della parte australiana della ricerca hanno trovato che, benché difficile da organizzare, il Change Laboratory è stato uno strumento straordinario per migliorare il senso d'iniziativa e d'imprenditorialità in studenti coinvolti in percorsi di formazione professionale. Durante i workshop gli studenti si sono confrontati con problemi risolti creativamente attraverso uno sforzo collettivo. Inoltre, grazie ai feed-back ricevuti durante i laboratori, gli studenti hanno pensato al senso d'iniziativa e d'imprenditorialità in termini di abilità relative all'occupabilità (employability skills). In questo modo hanno massimizzato la loro esperienza di apprendimento sul posto di lavoro ed in classe; si afferma inoltre che insegnare l'imprenditorialità a scuola richiede un cambiamento nelle pratiche d'insegnamento.

8 Italy and Australia: a comparative perspective

This chapter will compare the data gathered in Italy and Australia. It will start by comparing the multiple choice answers in the two contexts, and continue with the open answers on the sense of initiative and entrepreneurship and the Change Laboratory workshops as well. A discussion of the results will follow.

Questo capitolo confronta i dati raccolti in Italia ed Australia. Inizia con il confronto delle domande a scelta multipla nei due contesti, e continua con la comparazione delle domande aperte sul significato attribuito al senso d'iniziativa ed imprenditorialità ed al Change Laboratory; segue una discussione dei risultati.

(vedi riassunto in fondo al capitolo)

8.1 Comparison of the two settings

This comparative study was carried out in two countries, Australia and Italy. In order to help the reader better understand the contexts, the table below summarizes the elements considered to be particularly relevant to this research. On close examination, all these elements contribute to the richness of this research and show how different contexts comprise and signify the same concept: the sense of initiative and entrepreneurship.

Table 8-1. Comparison of the two settings where the study was conducted.

	OECD country	
	Australia	**Italy**
Relationship between vocational education and general education	VET in School is accommodated within general education	TVET and general education are delivered by different institutions
Logic served by the vocational system[1]	Educational	Educational
Possibility to continue to university after graduation	No	Yes
Qualification that was the focus of the research	VET in school Certificate III in Childcare	Diploma in Building Surveying
Provider	Catholic College and RTO	State Technical Institute
Logic served by the specific qualification[1]	Employment	Educational

[1] According to Iannelli and Raffe's (2007) types of transition system.

Type of vocational education delivered		Vocational	Technical
Duration of the course (years)		1	5
Hours of in school vocational subjects (per week)		6	4 Grade I 7 Grade II 18 Grade III 19 Grade IV 22 Grade V
Type of contract for work experience		School Based Apprenticeship Once a week for a year. Available for each student.	School to work alternation Two months' block work experience accommodated within the curriculum. Available only for the students participating in the study.
Participants in the workshops	students	5 females	10 males 3 females
	educators	2 teachers	2 teachers 1 school vice-principal 4 work tutors

This comparative study focused on the post industrial VET systems of two OECD countries. In Italy it was conducted in a State Technical Institute for training building surveyors located in the North, in a small city in the Lombardy region. In Australia the study was conducted in a Catholic College near Melbourne in Victoria. The course was a vocational Certificate III in Childcare.

In Italy the vocational system serves an educational logic (see Iannelli & Raffe, 2007). Vocational education is provided by public technical and professional institutes, and it is easy for students to continue to university after graduation. Although technical institutes specialize in technical education, vocational education is mostly delivered through school lessons. During Grade 1 and 2 most of the subjects are related to general education. From Grade 3 to 5 the overwhelming majority of subjects are vocational. The ties between schools and industry are loose; over the last 20 years Italy has lost its tradition of close cooperation between vocational education and industry (Gentili, 2012a).

Work experience is only provided during Grade IV, it is just two weeks' long and is for orientation purposes. In this study, a more consistent (two months' long) block work experience had to be accommodated within the curriculum and was made available only to the students participating in the research. Long work experience was made possible through school to work alternation, a formative tool allowing students to leave school for long periods and learn the equivalent competencies in the workplace.

Vocational education in Australia is delivered by diverse types of providers: TAFEs, Colleges, RTOs. They can be either public or private. Based on the distinction made by Iannelli and Raffe (2007), it has been argued that the Australian vocational system serves an education logic (Wheelahan, Moodie, & Buchanan, 2012). However, after taking vocational certificates such as VCAL it is not possible for a student to access tertiary studies immediately. Only some courses - especially the ones related to regulated occupations (nurses, electricians, etcetera) - operate according to an occupation logic (Wheelahan, Moodie, et. Al., 2012) where cooperation between the industry sector and the training is strong. This is the case of the Certificate III in Childcare which is the object of this study, and which is a School Based Apprenticeship. The course was jointly delivered by a Catholic Regional College and an RTO. The College provided the students and the rooms for the school lessons, while the RTO provided the teachers, course materials and (most of the time) work placement. Work experience was thus available to every student (although with some problems) once a week for the entire school year. However, the fact that VET in schools is accommodated within general education means that it is difficult to deliver strong vocational education in terms of both class lessons and work experience. In the course that is the focus of this research the class component was only six hours per week and work placement was one day per week.

Another element which is useful to understanding this study is the number and types of participants in the Change Laboratory workshops. In Australia five female students participated in the meetings, while in Italy ten male and three female students took part in it[2]. In Australia two teachers, the career counsellor and the RTO instructor took part in the workshops. In Italy the adult component was stronger: two technical teachers, the school vice principal/humanities teacher plus four work tutors participated regularly in the workshops.

One of the limits of this research was the low number of students participating, thus affecting the generalizability of this study. In Italy thirteen students answered the multiple choice questions, while four students in Australia responded to the multiple choice questions. In relation to the open questions, the researcher was able to gather data from nineteen people in Italy and seven in Australia. Nevertheless, Change Laboratory workshops are generally carried out with small numbers and pilot units (Engestrom &

[2] Gender issues have not been taken into consideration in this study.

Sannino, 2010). Bearing in mind the limits of the study, this chapter will compare the Italian and Australian outcomes of the workshops to draw conclusions on this new model for entrepreneurship teaching based on the Change Laboratory.

8.2 The multiple choice answers

This section will compare the responses to the multiple choice questions administered to the students in Italy and Australia. As the questionnaires were lengthy, a selection of the data is necessary to reduce the number of comparisons. First, the summary of Australian data will be compared with that of Italy. In order to undertake this comparison, the students' perceived level of their improvement over the experience, and the importance attributed to one's professional growth in the two contexts will be presented.

The chapter will then undertake a detailed analysis comparing students' perceived level of each single part of the knowledge, skills and habits comprising the sense of initiative and entrepreneurship, in the two contexts. While the knowledge and skills were rated according to the EQF descriptors, the habits were evaluated with a scale of four levels spanning from 'not existent' to 'excellent'.

The table below compares the overall educational outcomes in term of knowledge, skills, and habits related to the 7th European key competence in Italy and Australia.

Table 8-2. Comparison of the knowledge, skills, habits of the competence on the sense of initiative and entrepreneurship.

SENSE OF INITIATIVE AND ENTREPRENEURSHIP		Improvement in the two months' experience	Perceived level	Importance attributed for ones' professional growth
Knowledge	Australia	Somewhat	4 EQF	Very much
	Italy	Somewhat	3 EQF	Somewhat
Skills	Australia	Between somewhat and very much	4 EQF	Very much
	Italy	Somewhat	3 EQF	Very much
Habits	Australia	A little bit more	Good	Very much
	Italy	A little bit more	Good	Very much

Italy N= 13, Australia N=4.

In summary, there was a general improvement in the competence of the sense of initiative and entrepreneurship, the Australian students being on EQF level 4 and the Italians being on level 3.

In the first column there are the medians summarizing the knowledge, skills and habits. Each of them is split into two rows, one for Australia and one for Italy. In the columns there are: the subjective increase over the experience; the perceived level; and the importance of the knowledge/skill/habit for the student's professional development.

On analysis, over the course of the experience, students increased to some extent their knowledge of entrepreneurship[3]. While the Australian students rated their knowledge on EQF level 4, that is 'factual and theoretical knowledge in broad contexts within a field of work or study', their Italian counterparts rated it on a level 3, 'of facts, principles, processes and general concepts, in a field of work or study'. Another difference related to the importance of this knowledge for the students' professional growth. It was very important for the Australians, while only somewhat of value for the Italians.

As for the skills[4] related to the 7th European Competence, over the course of the experience there was an improvement between 'somewhat' and 'very much' for the Australian students, while the Italians students improved 'somewhat'. Similarly to knowledge, for skills the EQF level of the Australian youth was 4 ('skills required to generate solutions to specific problems') as compared to level 3 for the Italian students ('required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information'). Students in both contexts considered these skills very important for their professional development.

In relation to the habits[5], both groups believed that they increased their attitudes connected with the 7th European Key competence a little more. The perceived level at the end of the experience was good for both groups, and their habits were considered to be very important for their professional career.

The table below presents in detail the students' perceived knowledge related to the sense of initiative and entrepreneurship according to the EQF levels.

[3] Such knowledge was tested alongside five dimensions encompassing school and work: services for students in the school; professional practices at the work place; job opportunities and contraints; available Job opportunities once graduated; social and moral role of the industry area.

[4] These are: project work, planning, problem solving, communicating ideas, negotiating a solution, teamwork, self-organizing school and work activities.

[5] The habits related to the sense of initiative and entrepreneurship are: self confidence, creativity, taking the initiative, risk taking, perseverance, resourcefulness, self-management.

Table 8-3. Comparison Australia-Italy. Students' perceived level of knowledge according to the EQF descriptors.

SENSE OF INITIATIVE AND ENTREPRENEURSHIP		Perceived level of **knowledge** according to the EQF levels	
		Australia	Italy
1	Services for students in my school	2,5 Between 'basic factual' and 'facts, principles, processes and general concepts'	3 Facts, principles, processes and general concepts
2	Professional practices at my work place	4 Factual and theoretical in broad contexts	4 Factual and theoretical in broad contexts
3	Job opportunities and constraints	4 Factual and theoretical in broad contexts	3 Facts, principles, processes and general concepts
4	Available Job opportunities once graduated	4 Factual and theoretical in broad contexts	3 Facts, principles, processes and general concepts
5	Social and moral role of the industry area	4 Factual and theoretical in broad contexts	3 Facts, principles, processes and general concepts

Italy N= 13, Australia N=4.

The rows present the five types of knowledge representing the 7th European key competence. The columns present the perceived levels according to the EQF descriptors for Australia and Italy.

Overall, the Australian students reported that they gained a level EQF 4 for all the types of knowledge related to work experience, while the Italians acquired this level only for the professional practices in their workplace.

In relation to the services for students in the school, the Australian students reported that they had gained an EQF level between 2 (basic factual) and 3 (facts, principles, processes and general concepts), while the Italians reported EQF level 3. The knowledge of the professional practices at the workplace was rated by both groups at EQF level 4 (factual and theoretical in broad contexts). The knowledge of the job opportunities and constraints, the available job opportunities once they graduated and the social and moral role of the industry area were estimated by the Australian group to be at an EQF level 4 (factual and theoretical in broad contexts) and level 3 by the Italian students (of facts, principles, processes and general concepts).

The following table summarizes the results of questions related to the skills connected with the 7th European key competence in both samples.

Table 8-4. Comparison Australia-Italy. Students' perceived level of skills according to the EQF descriptors.

SENSE OF INITIATIVE AND ENTREPRENEURSHIP	Perceived level of **skills** according to the EQF levels	
	Australia	Italy
Project Work	4 On my own	3 Under supervision but I make some decisions
Planning	3 Under supervision but I make some decisions	3 Under supervision but I make some decisions
Problem solving	2 Doing it with my supervisor	3 Under supervision but I make some decisions
Communicate my ideas	4 To solve specific problems	4 To solve specific problems
Negotiate a solution	3 Applying basic methods	3 To solve problems applying basic methods
Teamwork	4 I actively participate	4 I actively participate
Self-organize school and work activities	4 On my own	3 Under supervision but I make some decisions

Italy N= 13, Australia N=4.

The rows present the seven skills related to the 7th European key competence. The columns present the perceived levels according to the EQF descriptors for Australia and Italy.

Overall, while the Australian students improved skills like project work and self-organization, both groups improved skills in communicating their ideas and team work.

On closer analysis, the Australian students said they could undertake project work 'on their own' (EQF level 4). In contrast, the Italian students could undertake project work 'under supervision but they make some decisions' (EQF level 3). In relation to planning behaviour, both samples stated they were on EQF level 3, they could plan under supervision and they could make some decisions. Concerning the problem solving skills, the Australian group was on an EQF level 2 - that is they solved problems 'under close supervision'. The Italian group was on level 3, they could solve problems 'under supervision but they make some decisions'. As for communicating new ideas, both groups were on an EQF level 4, they did it to solve specific problems 'interacting with others and taking into account their ideas'. Both groups were on EQF level 3 in relation to negotiating a solution - that is 'to solve problems applying basic methods'. For teamwork both groups reached an EQF level 4 as they reported having actively participated in the activities. The final skill connected with the sense of initiative was the capacity to self-organize one's school or work related activities. While the Australians said they were on an EQF level 4,

which means they did it on their own, the Italian students were on EQF level 3 meaning they did it under supervision but they made some decisions.

The following table presents the results of the students' perceived skills related to the 7th European key competence.

Table 8-5. Comparison Australia-Italy. Students' perceived level of habits.

SENSE OF INITIATIVE AND ENTREPRENEURSHIP		Perceived level of **habits**	
		Australia	Italy
1	Self confidence	Good	Good
2	Creativity	Good	Good
3	Take the initiative	Excellent	Good
4	Risk taking	Good	Excellent
5	Perseverance	Good	Excellent
6	Resourcefulness	Good	Good
7	Self-management	Between good and Excellent	Good
8	Judge my own strengths and weaknesses	Good	Good

Italy N= 13. Australia N=4.

The rows present the eight habits representing the 7th European key competence. The columns present the perceived levels according to the EQF descriptors for Australia and Italy.

In summary, the results were similar for both groups. However, while the Australian youth felt they were better at taking the initiative and self-management, the Italians believed they excelled in risk taking and perseverance.

As habits are not rated according to the EQF levels, for better clarity, the students were asked to rank their perceived level according to four descriptors: 'non-existent'; 'weak'; 'good'; 'excellent'.

More specifically, habits such as self-confidence and creativity were considered 'good' by both groups. Taking the initiative was considered 'excellent' by the Australian students and 'good' by the Italian students. The Italian students rated their attitudes concerning risk-taking and perseverance as excellent. These attitudes were considered as 'good' for the Australian students. Self-management was reported as being between 'good' and 'excellent' by the Australian group and 'good' by the Italian group. The reflective capacity to judge one's own strengths and weaknesses was considered as 'good' by both groups.

8.3 The open answers

This section will compare the responses of four out of the five open answers[6] obtained in Italy and Australia as outcomes of the research. In both contexts, this questionnaire was given to every participant in the workshops: students, teachers and work tutors. An overall analysis of the answers was carried out to find common categories. In the following charts the number of answers for each category has been converted into a percentage to allow comparisons between Australian and Italian data.

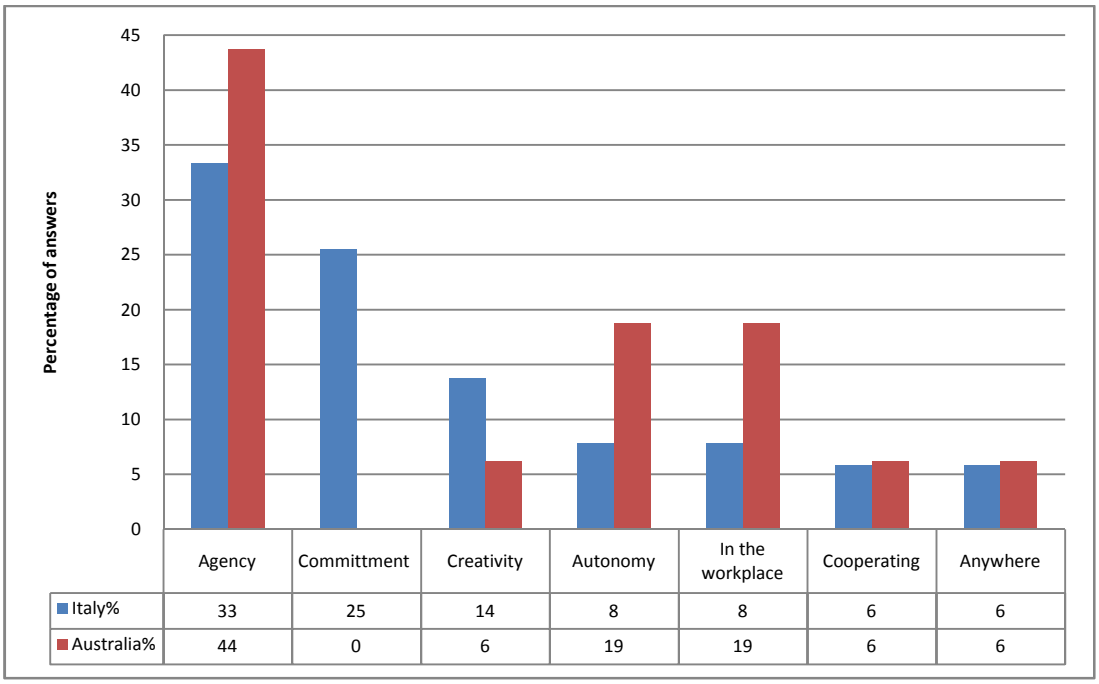
The reader should note that as the questions were open ended, depending on the richness and length of the specific answer, different parts could fall into different categories. Hence, this section will refer to the number of answers and not to the number of respondents. The four questions concern: the sense of initiative and entrepreneurship; what the participants think they have gained from participation in the workshops; and the strengths and weaknesses of the Change Laboratory meetings.

First question: what do you think the sense of initiative and entrepreneurship means?

The first question asked the participants what the sense of initiative and entrepreneurship is.

[6] The fifth question on how to improve the experience was different in the two contexts, therefore it was analysed according to the setting and will not be presented in this chapter.

Table 8-6. Comparison Australia-Italy. First open question: what the sense of initiative and entrepreneurship is?



	Agency	Committment	Creativity	Autonomy	In the workplace	Cooperating	Anywhere
Italy%	33	25	14	8	8	6	6
Australia%	44	0	6	19	19	6	6

Italy (N=19) Australia (N=7). The answers were reduced into categories.

The histogram above shows the percentages for both groups, blue for the Italian respondents and red for the Australian respondents. The vertical axis indicates the percentage of the category. The horizontal axis indicates the categories used to group the answers in order of importance: agency, commitment, creativity, autonomy, in the workplace, cooperating, anywhere. Below the chart the reader can find a table with the relative percentages for each of these categories.

Overall, in both contexts the sense of initiative and entrepreneurship concerns agency and working autonomously in the workplace. In the Italian group a dimension of commitment is also relevant.

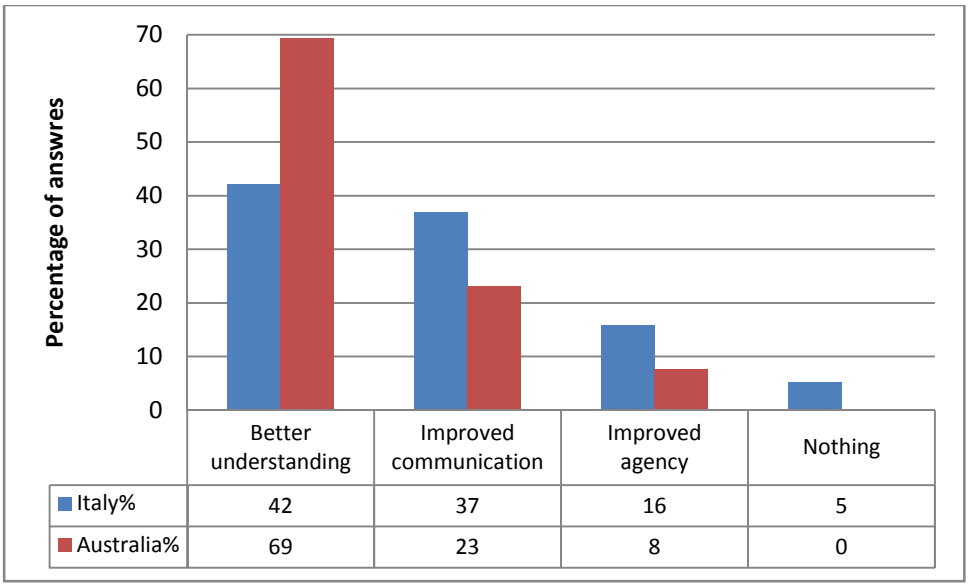
Agency is the dimension of primary importance when thinking of the sense of initiative and entrepreneurship. This accounts for one third of the answers for the Italian respondents and almost half for the Australian respondents. A second dimension related to personal commitment characterizes only the Italian group with one quarter of the responses. A third dimension encompasses creativity, which is stronger for the Italian respondents (14 per cent as compared to 6 per cent for the Australian respondents).

The four categories on the right side of the bar chart concern how and where the 7th European competence is put into action. It is principally put into action through working autonomously in the workplace. This is particularly true for the Australians: both the dimensions of 'autonomy' and 'in the workplace' are as twice as important (19 per cent of Australian respondents as compared with 8 per cent of Italian respondents). However, in both contexts this competence is also about cooperating with others (6 per cent) and it can also be mobilized anywhere (6 per cent).

Second question: what do you think you have gained from participation in the Change Laboratory (that is, in the meetings)?

This question asked the participants what they gained from participation in the workshops. The table below compares the Australian results with the Italian results.

Table 8-7. Comparison Australia-Italy. Second open question. What do you think you have gained from the participation in the Change Laboratory?



	Better understanding	Improved communication	Improved agency	Nothing
Italy%	42	37	16	5
Australia%	69	23	8	0

Italy (N=19) Australia (N=7). The answers were reduced into categories.

Similarly to the previous bar chart, the horizontal axis presents the four categories grouping the answers (better understanding, improved communication, improved agency, nothing), whereas the vertical axis presents the percentage of answers in each category. The Italian data is represented by blue bars and the Australian data is represented by red bars. Below the chart there is a table with the percentages for each category.

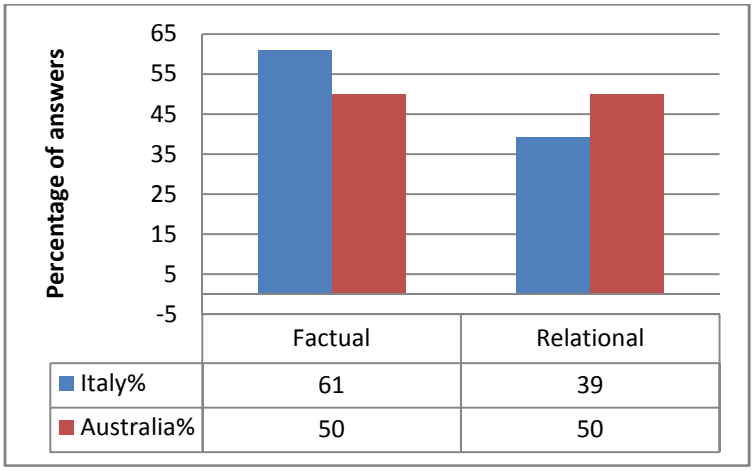
Overall, participation in the workshops enabled better understanding of the others' points of view and work practices, particularly for Australian respondents. Participation also improved communication among the parties.

On close analysis, participation in the Change Laboratory first allowed a better understanding of the work practices and the points of view of the other parties. An overwhelming majority of the Australian answers (70 per cent) fell into this category as compared to 40 per cent of Italian answers. Another gain from participation in the workshops was an improved communication between the different parties, especially for the Italian respondents, with almost 40 per cent of the answers falling into this category. A third gain was improved agency, particularly in stating ideas and participating in the meetings with a proactive attitude. Only one student in Italy said s/he did not acquire anything from the workshop.

Third question: what do you think the strengths of the Change Laboratory are?

The third question concerned the benefits of the Change Laboratory. The first bar chart displays the two groups according to the distinction factual/relational gains, and is followed by another two graphs which look in more detail at each of these categories.

Table 8-8. Comparison Australia-Italy. Third question. What do you think the strengths of the Change Laboratory are?



Italy (N=19) Australia (N=7). The answers were reduced into categories.

The chart displays the type of advantage on the horizontal axis, while the vertical axis presents the related percentage. The Italian workshops are represented in blue, while the Australian meetings are represented in red.

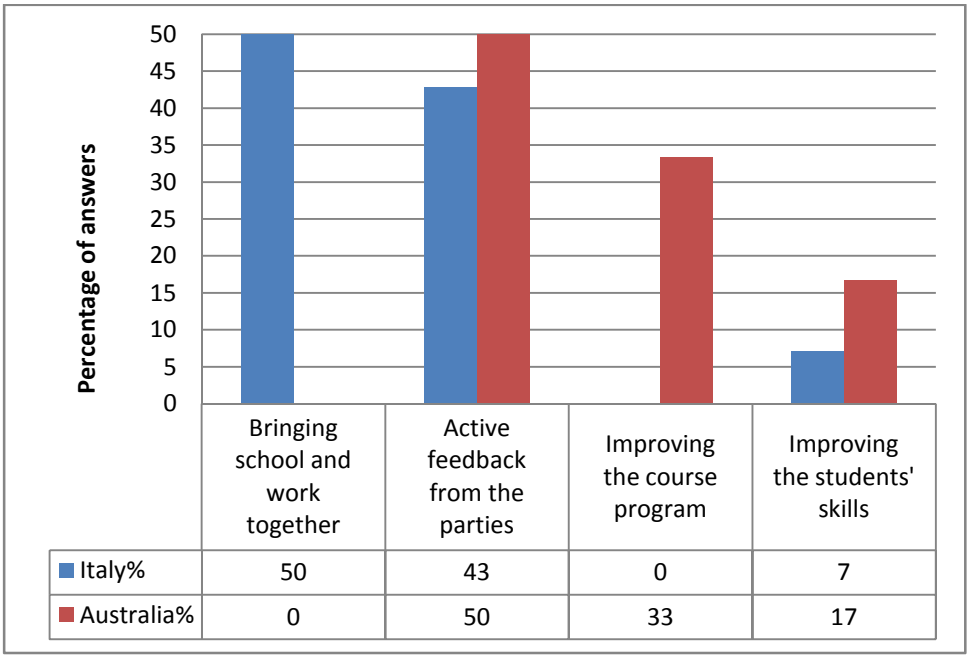
In summary, answers are almost evenly distributed in both contexts, and the workshops had both factual and relational advantages.

These categories were obtained echoing Bales' analysis of the interaction process (1950), and based upon the differentiation of two types of leadership: task oriented against socio-emotional. While in Italy the factual component is predominant with almost two thirds of the answers, in Australia it accounts for just half of the responses. Conversely, the relational component was present in just over one third of the answers in Italy and half in Australia.

As data about the advantages of the Change Laboratory is particularly valuable for this research, the next paragraphs will explore these results in more detail.

The next table compares the factual advantages of the Change Laboratory in Italy and Australia.

Table 8-9. Comparison Australia-Italy. Factual benefits of the Change Laboratory.



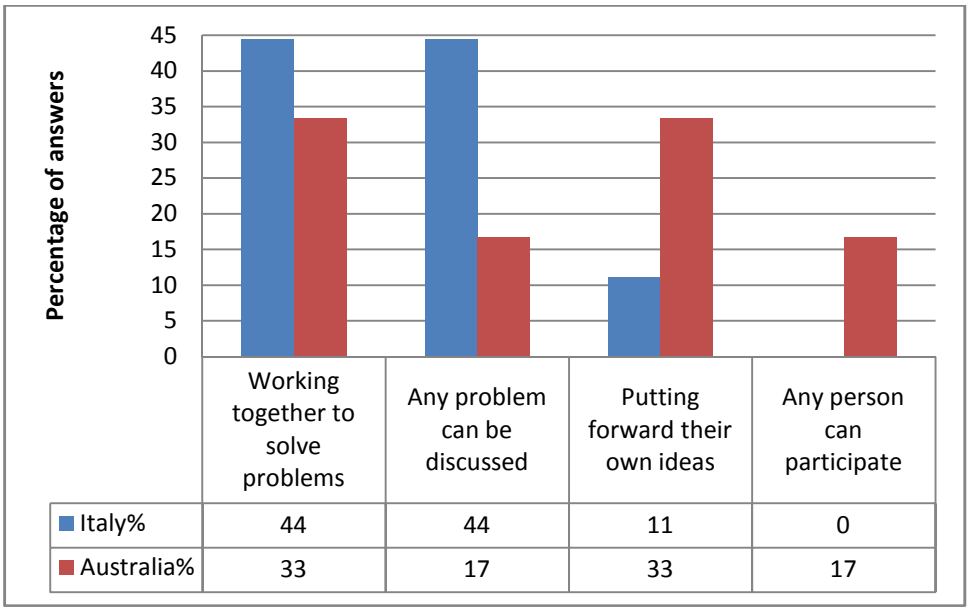
Italy (N=19) Australia (N=7). The answers were reduced into categories.

Overall, in both contexts the main factual strengths of the meetings concerned receiving active feedback from the various parties. In Italy another benefit was to bring school and the workplace closer together, while in Australia it helped to enhance the course program.

In further detail, in Italy the main factual advantage of the Change Laboratory (with half of the answers) was bringing school and workplace closer together. Active feedback from diverse parties was important in both contexts, accounting for half of the Australian answers and nearly half of the Italian ones. Another important factual strength in Australia was improving the course program, with one third of the answers. A last element for both contexts was improving the students' skills. This benefit was reported as being greater in Australia than in Italy (17 per cent against 7 per cent).

The figure below displays the relational advantages of the workshops in Italy and Australia.

Table 8-10. Comparison Australia-Italy. Relational benefits of the Change Laboratory.



Italy (N=19) Australia (N=7). The answers were reduced into categories.

In summary, the main relational advantage of the Change Laboratory in both contexts was working together to solve problems. In Italy another important relational advantage was that any problem could be discussed, whereas in Australia the opportunity to put forward one's ideas was considered valuable.

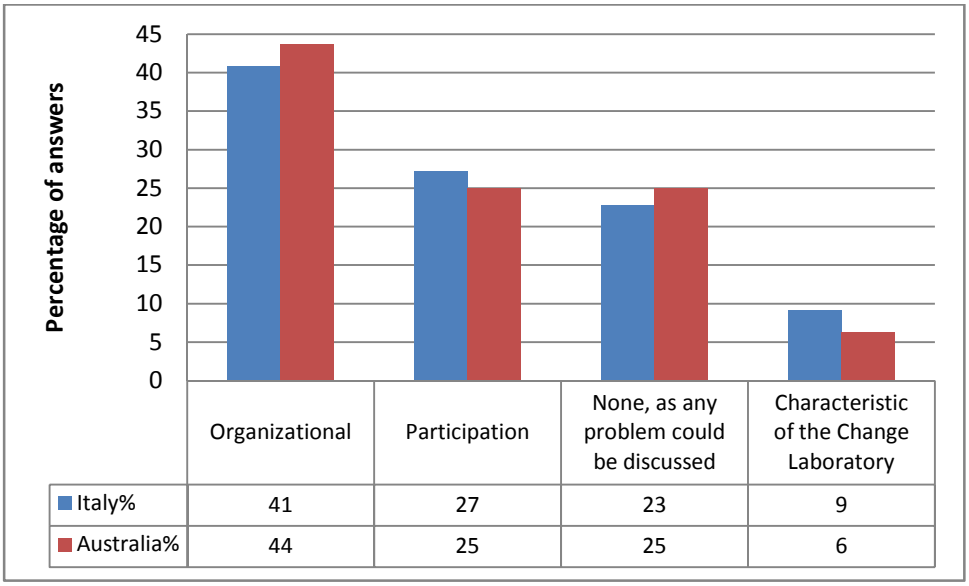
The main relational strength in both contexts was to work together to solve problems, with one third of the answers in Australia and almost half in Italy. Almost half of the Italian responses considered the fact that any problem could be discussed in the workshops as a positive aspect. The same benefit was reported by one fifth of the respondents in Australia. In both contexts another benefit was that the participants could put forward

their ideas (33 per cent in Australia and 11 per cent in Italy). A final advantage valid only for Australia (with almost one fifth of the answers) was that any person could take part in the workshops.

Fourth question: what do you think the weaknesses of the Change Laboratory are?

The fourth question enquired about the weaknesses of the workshops.

Table 8-11. Comparison Australia-Italy. Fourth question: What do you think the weaknesses of the Change Laboratory are?



Italy (N=19) Australia (N=7). The answers were reduced into categories.

In summary, in both settings the downsides of the Change Laboratory were mostly related to organization and participation. However, for some participants there were no issues, as every problem could be discussed in the workshops.

In both contexts the main weakness of the workshops related to organization with more than 40 per cent of the answers[7]. In Italy the main issue was that in the classes involved in the project the teachers were continuing with the program while one group of students, the ones involved in the study, were undertaking work experience. To avoid this overlap, the Italian participants suggested that work experience plus workshops be postponed to another period of the year, perhaps the school holidays. In Australia the

[7] This category was difficult define. In Italy the organizational issues encompass the Change Laboratory plus work experience, whereas in Australia the organizational concerns deal with the workshops only.

participants did not consider the number of meetings to be enough. For this reason they recommended organizing workshops more consistently throughout the school year. Moreover, the respondents suggested that the workshops should not be organized just as a pilot study, but made available for every student willing to participate.

A second downside of the meetings related to participation, as these meetings were only possible for a few students (one quarter of answers in both contexts). Not all of the students participated actively in the meetings, and there was the possibility of being misunderstood when contributing. However, one quarter of the answers in both the contexts pointed out that there were no disadvantages, as any problem could be discussed during the workshops.

A final category of downsides (accounting for 9 per cent of the answers in Italy and 6 per cent in Australia) was classified as characteristics of the Change Laboratory toolkit. The feedback might be inappropriate as 'not corresponding to truth' or too harsh; it was not possible to implement the new model of activity thus completing the cycle of expansive learning; and too much space was given to some problems while others (perhaps more cogent for the students) had been neglected.

8.4 Discussion of the results

This section will comment on the comparisons made above. Some hypotheses can be made from comparing the outcomes on the multiple choice questions which demonstrated that the Australian group peaked at an EQF level 4 while the Italians only achieved level 3.

Although the Australian sample could not be representative as it was too narrow, these results appear to be counter intuitive. In Italy there are two types of vocational training, professional and technical, and technical training is considered to be good quality and quite specific (Polesel, 2006). The EQF expected learning outcomes for Italian school certificates (ISFOL, 2012) level 3 would be a professional diploma (delivered by the professional institutes) while level 4 would be expected for a technical diploma (delivered by the technical institutes). The Australian students filled out the questionnaires at the end of their school year, four months after the end of the workshops, when the Certificate III had been completed. This means they were expected to be at an EQF level 3 which would be comparable to an Italian diploma granted by the professional institutes. By way of

contrast, the Italian students participating in the research had just begun their fifth year of the technical diploma, and therefore should be close to the EQF level 4 expected at the end of their school path.

In Australia the students participating in the project were aged from 16 to 18 years old, while in Italy they were 18 or 19 years old. In Italy technical subjects start being taught in the third year. This means that grade V students have already studied the subjects related to their future profession for four years when they commence their technical subjects. In contrast, a Certificate III is delivered in one year and has no entry requirements[8]. During observant participation it was observed that Italian technical students had a much greater number of theoretical lessons on technical subjects than their Australian counterparts. For instance, during Grade IV the Italian participants had 19 weekly hours (see Table 8-1) of technical lessons as compared to only six weekly hours for the Australian students. During observant particpation in Italy the researcher could look at the students' timetable: over the week, from Monday to Saturday, students had an average of three out of five daily hours of technical lessons.

A possible hypothesis to explain the different levels on the EQF found and expected in Italy and Australia could be the different type of work experience, block versus one day a week. However, the total number of working days was roughly the same (40 days). Furthermore, many work tutors in Australia observed that one day per week was not enough to get into the activities and give continuity to work experience. Instead, block work experience appeared to be effective in Italy: with such full immersion the students could really feel they were part of the work activities.

A second hypothesis, due to the fact that the students themselves rated their own knowledge and skills, could be that the Australians might over estimate their competence and the opposite may be true for the Italians. However, like Tafjel (1981) who excluded the cultural element to explain the differences found in his experiment as empirically not verifiable, this thesis can be rejected as unlikely and difficult to prove.

Another possibility is that the profession of building surveyor requires more time to build than that of childcare. A surveyor has to deal with tasks and contexts wider than those of a person working with children. There is more variability within building sites,

[8] In Australia this represented a problem which was also adressed during the Change Laboratory workshops. Some previous work experience was made mandatory for the course delivered the following year.

offices and practices in surveying than among kindergartens. Also the spectrum of tasks a building surveyor has to be able to perform is wider than the tasks of a childcare assistant: designing blueprints, checking the work status, taking measures, making structural calculations. For this reason it could be possible that surveying is a vocation that requires greater time to be learned, and consequently higher levels of autonomy (the EQF defines competence according to autonomy) need more time to be gained.

As the EQF model measures the learning outcomes rather than the time needed to gain them, the EQF model takes into account that some competencies need more time to be acquired in different environments and for different professions. This should not be seen at odds with the fact that the competence measured in the questionnaire is the same. Acquiring skills such as teamwork, project working and planning in a kindergarten is very different to learning them in a building site. Current research acknowledges that competence is context dependent: "solving an electrician's problem such as calculating how many power points may be run off a cable is quite different from solving a nurse's problem such as ensuring a patient takes their medication" (Wheelahan & Moodie, 2011, p. 8). There are not general abilities which can be easily put into actions in different contexts. This is in line with the situated and distributed model of competence as boundary crossing used in this research project.

In relation to students' perceived level of skills, in both contexts students learned how to work in a team and communicate their new ideas at an EQF level 4. This could be due to the Change Laboratory workshops, which are based on communication in a cooperative climate. Further research is needed to support this hypothesis and to see what type of knowledge, skills and habits are bolstered by Change Laboratory workshops.

Concerning the open questions, the first one examined the meaning of the sense of initiative and entrepreneurship. In both settings the responses to this question were enriched by the banners made by the students. In Italy students explained how this competence should be mobilized in the workplace, for example when having a problem and going to their mentor with a proposed resolution. The Australian banner on mutual expectations dealt with the employability skills, another side of the sense of initiative and entrepreneurship. Many aspects of these banners related to the answers to the first question, as has been shown in the respective chapters. This suggests the formation of a mental shared concept about the sense of initiative and entrepreneurship and how to put

it into action in the workplace. The individual dimension of this competence and the collective one are closely interconnected.

In response to the first open question, agency was the most important dimension. Commitment was also considered important in the Italian context. This appears to be reasonable, as starting a venture requires commitment from the individual. Another two noteworthy characteristics of the sense of initiative and entrepreneurship emerged from the first question. First, autonomy is necessary when mobilizing this competence. In order to take the initiative a student has to know what to do and how to do it in the specific situation, so that s/he does not have to ask and can thus act autonomously. The dimension of autonomy was considered the most important for the students, and schools should aim for students to learn autonomy when teaching for entrepreneurship (Van Gelderen, 2012). Autonomy is also an important dimension in the DeSeCo model of competence and in the EQF, where competencies are measured according to different levels of autonomy (from being supervised to supervise or even lead a group).

Secondly, the workplace is the place elected to mobilize the sense of initiative and entrepreneurship, as also shown by the banners. Working by project, showing initiative and problem solving, amongst others, are skills which are stressed and put into action in companies rather than classroom settings. Indeed, the Italian economy which is mostly backed by SMEs seems to make extensive use of the skills related to entrepreneurship: teamwork, project work, and problem solving with networks of professionals coming from different organizations. This mode of operating recalls closely new forms of work such as co-configuration (Engestrom, 2004a) and knot working (Engestrom, 2008a, 2008b).

Many answers also reported that the 7th European key competence was connected to cooperating with others to solve problems, and this can be directly connected to the Change Laboratory workshops. Nevertheless, while entrepreneurship characterizes the business world, the sense of initiative can also be relevant to students in all moments of their lives. This means that the participants are able to start seeing this competence from a lifelong learning perspective.

The comparison of the answers to the second open question on the gains from participation in the meetings also reveals interesting meanings. The participants acquired a better understanding, which led to a collective reflective dimension as the main gain of the workshops. Another gain was improved communication between the parties and thus a

better understanding of the other's point of view. The third gain in order of importance was improved agency. By connecting the first and the second question it could be argued that the Change Laboratory workshops improved the subjects' awareness and understanding of the sense of initiative and entrepreneurship, which was then put into practice in the workplace.

The third question on the benefits of the Change Laboratory discovered a balance between the factual advantages and the relational ones in both contexts. The Change Laboratory was suitable both to solve the problems the group faced and improve the communication between the parties. With the active feedback provided by the mirror materials and the presence of each party, the participants were able to better understand the other party's point of view. This helped participants find a shared solution which in turn improved the group relationships. The flexibility of the Change Laboratory which is adapted to the contextual situation and problem was also clearly a factual benefit. In Italy it helped bring together the school and workplace, while in Australia it contributed to improving the course program.

The fourth question concerned the drawbacks of the Change Laboratory. The comparative analysis between the two contexts where the workshops were carried out suggested organization was a main downside. According to the participants, the problem was not the Change Laboratory itself, but the fact that the meetings should be distributed evenly throughout the school year.

Another source of downsides stemmed from participation issues. As the Change Laboratory is about collective social change, more people should be included, for example students of the same class. The school director should also be invited to the meetings when possible, so that if a new model of boundary crossing is envisioned, this can be put into practice with more ease. Involving all the teachers of the class (or at least keeping them informed) is another essential element of the transformation effort. Without their cooperation change might be more difficult, as it was in the Italian part of this study.

Students also recommended that these workshops should not just be done for the sake of research, but should be made available to every student in the school. Rather than being a criticism, this seems to be an encouragement to improve and offer the workshop again. It is also evident that if more people were involved in the meetings it would be easier to carry out transformation of the activity system. At the same time the literature

on the matter refers to small units (see Engestrom & Sannino, 2010) because it would be difficult to bring about dialectics with large groups, as not everyone would be able to participate in the discussion.

This raises a potential problem. It is not clear how a change of practices obtained in a small unit is then generalized to the whole organization, except perhaps through other Change Laboratory units. Further research is needed to clarify this point. However, developing the workshops is costly in terms of preparation and time needed to gather the mirror materials in the field, and this may represent an obstacle to extending the workshops to more units of an organization.

Another issue related to participation was that not every student intervened, and some felt they had been misunderstood by the group. This last issue might also be due to the students' limited dialectical abilities, as the Italian humanity teacher and vice-school principal participating in the workshops pointed out. There are also power relationships inside the workshops, and students know that what they say might not please their educators, teachers, school principal and mentors. However, it is also true that the relationships and the cooperative atmosphere created within the workshops differed greatly from that of the classroom. From the feedback collected, it was clear that teachers were open to listening to their students. In the open answers the teachers wrote that they were able to get to know their students from a different point of view which could not be seen in the regular classroom relationship. All in all, they were impressed by their students. The teachers' changed attitude towards their students can be seen as another learning outcome of the Change Laboratory when used in class contexts.

A last group of downsides were the characteristics of the Change Laboratory. More meetings would have been necessary to find a shared solution to the problems. Furthermore, too much space in Italy was given to envisioning the future of work experience and not enough time to the problems the students were experiencing in the present. In Australia, sometimes feedback was not considered to be adequate. All these issues demonstrate the authenticity of the Change Laboratory which is built on ethnographic data and is adapted to the specific context. These issues also represent the multiple voices inside the workshops and the dialectics between the several points of view: sometimes it is difficult to find agreement and perhaps more time and workshops would be needed for dialectics. In any case, one quarter of the answers said there were no

drawbacks in the Change Laboratory, as every problem could be discussed. This is important as it shows the effort made to create a cooperative climate inside the meetings, allowing anybody to say what they thought and what they thought should be done about a specific issue.

The researcher is aware of the organizational problems in setting up a Change Laboratory in a school. First of all, the school representatives do not know about this methodology and are often sceptical. From the organizational point of view, this methodology involves a significant amount of field observation in order to gather the mirror materials. Those materials deal with real problems the actors are coping with, so they change over time and contexts, and can seldom be reused in another Change Laboratory in a similar context to trigger dialectics. Organizationally speaking it is also difficult to have representatives from school and work sitting together in the same place. However, the small number of participants allows everybody to express their opinion and show initiative, and small numbers are recommended for entrepreneurship teaching (European Union, 2009).

In conclusion, from these answers it seems that the spirit of the Change Laboratory has been fulfilled in both contexts. This could be summarized as the presence of the different parties and the will to cooperate to analyse the problems and find shared solutions. Such a collective effort to change the reality and to solve problems was converted into an improved sense of initiative. Through participation in the Change Laboratory students acquired agency and a reflective understanding of how to mobilize this competence in the workplace: asking questions, having a go, being proactive and ready to seize the available learning opportunities. This in turn has improved their employability skills.

In conclusione, dalle risposte raccolte sembra che lo spirito del Change Laboratory sia stato mantenuto in entrambi i contesti; questo può essere riassunto come la presenza di diverse parti (dunque punti di vista) e la volontà di cooperare per analizzare i problemi e trovare soluzioni condivise. Questo sforzo collettivo per cambiare la realtà e risolvere i problemi è stato convertito in un aumentato senso d'iniziativa e d'imprenditorialità: attraverso la partecipazione gli studenti hanno acquisito agency ed una maggiore comprensione dovuta alla riflessione su come mobilizzare questa competenza sul posto di lavoro: chiedere domande, provare, essere proattivi e pronti a cogliere le opportunità d'apprendimento disponibili. Di riflesso questo ha aumentato le abilità connesse all'occupabilità (employability skills).

9 Conclusions: vocational education and entrepreneurship education face their common Zone of Proximal Development

Entrepreneurship education and TVET are two types of education that aim directly at increasing the employability of students and trainees in two major types of employment: self-employment (which includes establishing and developing SMEs) and paid employment. Both types of education directly link the educational course to the labour market, widen the scope of choices for students and graduates, optimize the utilization of individuals' potential, and contribute to the comprehensive development of society, both economically and socially.

A.A. Badawi for UNESCO-UNEVOC, 2013, p. 279.

The Zone of Proximal Development (ZPD) is a Vygotskian concept, and describes the difference between what the child is able to perform on its own and what s/he could be able to execute with the help of an educator or more expert peer (Vygotsky, 1978). In CHAT this concept has been enlarged to encompass multiple interacting activity systems (Sannino & Engestrom, 2010): in a Change Laboratory, during a cycle of expansive learning, the participants envision the ZPD of their activity system(s). In a similar vein, Engestrom (2004b) utilizes this concept to envision the future of research for expertise. This chapter will similarly envision the ZPD of the two complementary forms of education which were the object of this study: entrepreneurship education and vocational education. The citation above from UNESCO underlines the advantages of these types of education for both individuals and society. It also emphasises the importance of and the renewed interest in these types of education internationally.

Firstly, this chapter will summarize the research which was conducted. To do so, it will first frame the context and describe the comparative project within its two settings. It will then reiterate the main findings and make final observations about the role of boundary crossing in modern VET, looking for relationships between the cultural approach to

entrepreneurship, the Change Laboratory and the capabilities approach. This chapter will then identify possible directions for future research, thus examining the ZPD in the sense of initiative and entrepreneurship in vocational education. On the one hand, the ZPD is the close cooperation between school and workplace, and, on the other hand, it is the teachers teaching for entrepreneurship in an entrepreneurial way. In both cases the Change Laboratory toolkit could play a key role in improving active participation and democracy at more levels of schooling. Lastly the chapter will make final comments with recommendations for schools, employers, teachers and policy makers.

The role of entrepreneurship and TVET in globalized societies

In the introduction chapter it was argued that, as a consequence of globalization, we are experiencing a major shift from managed society to entrepreneurial society (OECD, 2010c). In this society, SMEs (small and medium enterprises) play a major role in promoting innovation and employment. Research shows that innovation is more likely to take place in SMEs than in R&D (research and development) departments of big companies (Audretsch, 2003). SMEs need innovation to thrive in the market, and this can come from entrepreneurs but also from the employees, especially in high-tech companies, where many workers are TVET graduates (Badawi, 2013). Vocational education is located in a prominent position to support innovation in SMEs (Garlick et al., 2007) not only with projects and partnerships, but also in providing students with the technical and lifelong learning competencies needed by local industry. Furthermore, more vocational graduates work in and start SMEs than general education graduates (Atkinson, 2011). It has also been claimed that enterprising VET can promote growth in suburban and rural areas (Garlick et al., 2007).

The knowledge era we live in is characterized by the knowledge society and the knowledge economy, but even more importantly, the 'knowledge mindset' useful to "navigate today's uncertainties and tomorrow's unknown developments, not only in labour markets but in all aspects of life" (Badawi, 2013, p. 277). Not only will youth have to be able to show skills and knowledge related to their field of work and study, they will also have to be able to deal with changes, learn from experience, think critically, and be autonomous.

From a human development point of view, Sen (1990) acknowledges that the basic function of education is to improve one's ability to exercise freedom. Improved education

can help better distribute GDP among different individuals. It can also contribute to transforming income and resources into varied functionings and help a person choose between diverse ways of living. In any case, it is the role of education to provide youth with the competencies needed in society. In this respect, two complementary forms of education have been identified to tackle youth unemployment; these are entrepreneurship education and TVET.

Vocational education should prepare students for the entire spectrum of their working life. Unfortunately, nowadays TVET courses are mostly geared toward paid employment. In this respect, entrepreneurship education can help students widen their work opportunities, and, in so doing, also improve the attractiveness of vocational education (Badawi, 2013).

Both TVET and entrepreneurship education should be studied according to a capabilities approach. This is because even if it is true that entrepreneurship can contribute to economic growth, this does not translate automatically into human development (Gries & Naudé, 2011). Seen from Sen's capabilities approach, income and wealth (as well as technology and economic growth) only partially account for human development, which is about expanding one's positive freedom. Hence, the word 'positive' should also be used when defining entrepreneurship, which is about spotting and exploiting positive opportunities and creating value both for the individual and their community.

Using a capabilities approach in vocational education is particularly important, as this contributes to a focus on the students' ability to make complex judgements in the workplace and outside, rather than merely concentrate on entitlements or skills and attributes needed for a specific and predetermined job position (Wheelahan & Moodie, 2011). The centrality of the subject with their freedom to do is therefore emphasized. Due to the agency based on their capacities, the individual becomes the trigger of social and economic development, which is inclusive, sustainable and smart (Costa, 2012). TVET should thus aim at improving students' capabilities and functioning, which is valuable to individuals, groups and communities. This not only involves public dialogue between the many actors but also participatory research methods (Tikly, 2013). Hence, the spaces where individuals can discuss and make decisions are of particular importance to improving their capabilities (Costa, 2012).

The story so far …

This study examined how to boost the sense of initiative and entrepreneurship in TVET in the context of two advanced post-industrial OECD countries, Australia and Italy. The starting point was to apply a type of workshop – the Change Laboratory – for entrepreneurship teaching to vocational students undertaking work experience. The framework chosen for this study was Cultural Historical Activity Theory, where the theory of expansive learning accounts for collective decision making and learning, as well as social change.

Following CHAT and the theory of expansive learning, the focus of the research was enlarged beyond the individual to encompass the entire organizations involved. School and work are two different activity systems with different goals, but they both aim to transform the student into a professional. During work experience, students cross between the boundaries from school to work as active members of their acitivty system, thus possibly creating innovation.

According to previous research, a triggering event is necessary to mobilize the student's sense of initiative and entrepreneurship (Heinonen & Poikkijoki, 2006). In this project the triggering event has been represented by a salient problem encountered by the students during boundary crossing. These issues are often due to the fact that students belong simultaneously to different activity systems with conflicting elements, and the need to adjust to different rules, divisions of labour, communities, tools and objects of the activity system. In CHAT problems at the boundaries are considered as possible resources for the development of the activity systems.

In Australia the research focused on a Certificate III in Childcare jointly delivered by an RTO and a Catholic College situated in Melbourne. In Italy the project was conducted in a state technical institute for building surveyors situated in the Lombardy region. In both cases vocational students (aged from 16 to 19 years old) undertook long periods of work experience, either two months' block or once a week for a year. Comparing these settings (Italy and Australia, vocational and technical education, block work experience and weekly day work placement, a small number of participants and a greater number) has provided varied criteria for this study to consider how different realities comprehend the same concept, the sense of initiative and entrepreneurship.

During Change Laboratory workshops, helped by mirror materials and the researcher, students with teachers and work tutors discussed the issues they were having at school, at work or at the intersection between the two. Altogether the participants found shared solutions and put them into practice, thus improving their ability to turn ideas into action, the core element of the competence on the sense of initiative and entrepreneurship. In Australia the main issues students had to deal with were the continuous turnover of teachers in the classroom and a childcare centre director who claimed that her students lacked employability skills. In Italy, only the students participating in the project could obtain work placement, and teaching in the other classes continued as usual. This resulted in the students participating in the research feeling that they had been left behind.

The learning outcomes of the overall experience were inspected through a follow up questionnaire comprising a quantitative and a qualitative section. In the quantitative questionnaire the students answered multiple choice questions regarding the components of the 7th European key competence of the sense of initiative and entrepreneurship: knowledge, skills and attitudes (European Commission, 2007). Knowledge and skills were described according to the appropriate EQF level, and these descriptions were generally made according to the degree of student autonomy in the workplace. The qualitative part of the questionnaire was aimed at examining the participants' attitudes to the Change Laboratory as a means of social change, as well as the sense of initiative and entrepreneurship. Further outcomes of the workshops were the banners collectively drawn by the students and analysed as shared mental concepts preceding action (Engestrom et al., 2005). In Australia students made two posters, the first on the perfect teacher and the second on mutual expectations in the workplace. In Italy the students made three banners, one on how to initiate in the workplace, and the other two on the ideal work experience.

9.1 Main findings

This study found that:

- The combination of school lessons, work experience and Change Laboratory workshops enhanced the European competence related to the sense of initiative and entrepreneurship up to an EQF level 4 (exercising self-management within the

guidelines of work or study contexts that are usually predictable, but are subject to change) in high school vocational students crossing the boundary between school and work. Two skills belonging to the sense of initiative and entrepreneurship appeared particularly related to the Change Laboratory: communicating ideas and teamwork. The level of competence acquired according to the EQF seems to be also dependent on the profession the student is learning;

- According to the participants in the research, the competence of the sense of initiative and entrepreneurship is primarily about agency. The dimension of personal commitment also appeared to be important in some contexts. The sense of initiative and entrepreneurship, especially at an employability level, was reported as related to being autonomous, as well as cooperating with others. There is no doubt that this competence is mostly mobilized in the workplace; however the participants said that it can also be put into practice in every context of daily life and hence in a lifelong learning perspective;
- From participation in the Change Laboratory workshops the participants gained a better understanding of the work practices and others' points of view. This leads to a collective reflective dimension: over the workshops the students could think about how to improve their conduct especially in the workplace and how to show more sense of initiative (asking questions, having a go, being proactive; having a can do attitude), thus improving their learning experience and employability skills. Another gain from the workshops has been improved communication between the parties and increased agency;
- There are two categories of benefits from participation in the Change Laboratory workshops applied to entrepreneurship teaching: factual and relational. On the one hand the participants discussed and collectively solved the problems they were faced

with. On the other hand, they improved the communication between the parties. The factual benefits included active feedback from the parties and improving the students' skills. The relational benefits were: working together to solve problems, any problem could be discussed, putting forward their own ideas. In any case, due to the flexibility of the Change Laboratory toolkit, the benefits vary according to the setting, for example in helping to bring the school and workplace together, or improve the course program;

- Although many participants thought that there were no drawbacks to the Change Laboratory as any problem could be discussed in it, the downsides were mostly organizational: for example more students (from the same class or from the school) should take part in it; there should be more meetings which are more consistently organized throughout the school year. Another source of issues stemmed from participation: not all the students contributed and sometimes students felt they were misunderstood. A remaining group of downsides was intrinsic to the Change Laboratory, and was due to the different points of view (multivoicedness): sometimes it was difficult to come to shared decisions, and more workshops were necessary. Suggestions of how to improve the experience included school lessons, work experience and Change Laboratory workshops which called for more integration and coordination between school and workplaces.

9.2 Final considerations

The importance of boundary crossing in vocational education to boost the students' competence

Cultural Historical Activity Theory, the theoretical framework used in this research, helps look at the school as a system in dynamic interaction with neighbouring systems, for example workplaces (Ajello et al., 2005). Since the object of the activity in these may be

different, the rules, division of labour, community, tools and signs will be varied. This explains why competencies learned in one context are diverse and not easy to put into action in the other context. The two activity systems also share a common goal, the student's learning (Akkerman & Bakker, 2012). The development of the student seen as a future professional helps the two systems look at their interdependence and avoid the 'encapsulation' of knowledge (Engestrom, 1991). This is knowledge that cannot be re-contextualized[1] in other neighbouring activity systems, for instance some theoretical knowledge at school, or skills in the workplace which are too specific. In both cases this knowledge does not generate competence, because it cannot be used to solve problems in new situations. Vocational education should thus provide the students with varied contexts where knowledge and skills can be put into action and turned into competence.

Boundary crossing overcomes the problem of encapsulation because it implies a different vision to knowledge transfer: it includes ongoing, bidirectional actions and interactions between practices (Saljo, 2003). In boundary crossing, students are not just seen as newly arrived members to be socialized: they bring expertise from their participation in other practices. They are seen as active members, and contribute to mould the environment and make innovation happen. Competence seen as boundary crossing is particularly useful in building surveying, where problems are often new, and competence has to be re-contextualized to be effective. In order to perform their activities, in the building sites, in the offices, and at the local municipality, surveyors form teams 'ad hoc' with people coming from other organizations (often architects, building engineers and builders, but also many others). The same model is also useful for youth studying childcare, even if the environment and the problems appear to be less varied. In general, children need stable environments in which to grow up. However, kindergarten teachers have to work with different professionals and master new problems, and with a clientele which is changing and has new and different needs.

Thus, mastering change is the main goal of boundary crossing. Nowadays students must learn how to work in flexible and mutable organizations, characteristics very important in a globalized world. Engestrom (2008a) contends that "today, static teams are increasingly replaced by fluid forms of knot working around runaway objects that require and generate new forms of expansive learning and distributed agency". Boundary crossing

[1]This terminology was used by Van Oers (1998) when addressing the issue of knowledge transfer.

is about finding productive ways of relating intersecting dissimilar practices (Akkerman & Bakker, 2012). Phenomena such as globalization, the knowledge society, new production methods and forms of organization have set the context for an innovative relationship between school and industry (Stenstrom & Tynjala, 2009). The use of long periods of work experience is thus one of the most important developments in TVET. Eventually work placement should be seen as embedded in the schooling process rather than as a practice which is external to it.

Cultural approach to entrepreneurship, the capabilities approach and the Change Laboratory

This section will analyse the convergence which exists between Kyrö's cultural approach to entrepreneurship, the Change Laboratory of Engestrom et al. and Sen's capabilities approach.

The first commonality between the capabilities approach and the Change Laboratory is the importance attributed to agency. There is no doubt that the agentive dimension is the main dimension in both contexts characterizing the sense of initiative and entrepreneurship. A triggering event is needed for entrepreneurship teaching so as to mobilize the participants' agency. During a Change Laboratory the mirror materials and dialectics are intended to mobilize the individual's agency: the participants come to the point of realizing that something must be done by the group to change the present state of things. Agency characterizes the Change Laboratory with its two epistemological principles: ascending from the abstract to the concrete and the double stimulation (Sannino, 2011a). In the capabilities approach, agency is seen as 'human agency' and characterizes the ability of individuals to work toward the aims which they consider to be valuable (Alkire, 2005). This is a core ingredient of positive social change.

The Change Laboratory and the capabilities approach, together with the cultural approach to entrepreneurship, also share the importance given to the link between the individual and the wider society, taken as collectiveness. The Change Laboratory connects the individual and the group dimension through the collective effort to change the state of things. The Engestrom triangle (1987) is used for the analysis of the criticalities of the activity system(s). This triangle looks at the possible interconnections between its elements, and connects the subject with the activity system, community, rules and division of labour. In so doing, analysis of the problems is dealt with from both an individual and

collective point of view. According to Kyro's cultural approach, entrepreneurship education can be studied from an individual and collective point of view. Most importantly, these points of view are interactional and cannot be separated (Kyro, 2006). Similarly to the cultural approach to entrepreneurship, the capabilities approach also stresses the connection between individual and society: in its quintessence, individual freedom is a social product (Sen, 1999). The interconnection between individual and social agency is based on trust in logos, that is, in discursive practices, and the capacity of human beings to reflect on their conduct (Costa, 2012). In this study the subject and the group have been considered as interconnected, even in the research outcomes: questionnaires completed individually plus posters made by the groups. The posters recalled many elements expressed individually in the open questions.

In essence, the capabilities approach, the cultural approach to entrepreneurship and the Change Laboratory focus on participation in order to transform and generate new practices. Kyro (2006) for instance suggests that the cultural approach to entrepreneurship is linked to economic development, democracy and liberalism. Entrepreneurship is needed in particular moments of history when there is a need for cultural transitions, and ideas of freedom become essential for the success of the society itself. In such periods of transition entrepreneurship becomes valuable in triggering change with the creation of new practices and the transformation of old systems and institutions. Also for CHAT, periods of turmoil and the need to transform current practices are essential. Building on the Vygotskian legacy and Marx's idea of revolutionary practice (Sannino, 2011a), the Change Laboratory aims to transform social practices. Marx is also considered as one of the roots of the capabilities approach. On his book on living standards, Sen (1984) suggests that it is possible to concentrate on the individuals' capabilities and positive freedoms as indicators of living standards, which are closely linked to Marx's foundational concern, that is "replacing the domination of the circumstances and chance over the individuals by the domination of individuals over chance and circumstances" (Marx in Sen, 1982, p. 296). In relation to social change, Sen contends that individuals have to be given the possibility to shape their future instead of being seen as passive beneficiaries of "cunning development programs" (Sen cited in Aikire, 2005, p. 218).

This emphasis on social change through democratic processes at all levels is particularly important in school. Repetitive activities such as lectures can be accompanied by inclusive spaces where students contribute actively to shape the practices they are part

of. This democratic process emphasises the shared values emerging from active participation and dialectics: the diverse points of view become valuable and become a resource to bring about innovation, thus creating capabilities for new functionings.

Nowadays it is not sufficient to offer a student a predetermined educational path, even if it is the most appropriate for the student. Students also need to be provided with participatory spaces where they can discuss and reflect on the issues important for them, so that they can make informed decisions. In addition to creating new opportunities, this process also expands the students' positive freedom, autonomy and personal initiative. An inclusive educational system should embody this process. On the one hand it is true that the student should act like a 'little entrepreneur of themselves'. On the other hand, when the student fails s/he should not be seen as at fault. To the contrary, an inclusive system should look at the elements of the process that did not allow the student to succeed in what s/he valued as important for themselves.

What is ZPD of the sense of initiative and entrepreneurship in VET?

The paragraphs above have emphasised the importance of close relationships between school and industry, up to the point where work experience is seen as part of the schooling process. Hence, the first ZPD of the sense of initiative and entrepreneurship in vocational education is tightening the interactions between school and work places. This could be done with partnerships, common projects, students taking leave in the industry, 'exchange programs' for workers in the school and teachers in the industry; entrepreneurs visiting schools and delivering lectures. The fact that school and work should work hand in hand to train students should be seen as work at the boundary rather than boundaries fading out[2]. It is at the boundary where innovation lies, and differences and problems are seen as a source of learning and positive change.

Change Laboratory workshops have proven to be a powerful tool to enable all actors to discuss problems and find shared solutions at the boundaries in enlarged decisional processes. As Pontecorvo, Ajello, and Zucchermaglio (2004) point out, by discussing, people learn. Creative collective problem solving and reflection are the two characterizing processes of the Change Laboratory, and are intimately related. The more interiorization processes become critical reflection, the more externalization as search for new solutions

[2] Boundaries are defined by Akkerman and Bakker (2011) as sociocultural differences leading to substantial discontinuity in action and interaction.

can increase (Ajello et al., 2005). Another reason for setting up a Change Laboratory is that reflexive practices are effective only when they take into consideration real life situations (Costa, 2011). Competent action is due to the capacity of the individual to increase the possibilities through problem solving. As a result, new creative connections and possibilities for critical reflection are generated (Costa, 2012). The model of integrative pedagogy (Tynjala & Gijbels, 2012) also underlines the importance of the reflexive knowledge and progressive problem solving needed in today's rapidly changing word. Reflexive knowledge is a component of professional expertise, the other three components being theoretical, practical, sociocultural knowledge. Problem solving is the process to connect these four types of knowledge and to turn them into professional expertise.

As highlighted by the European Commission (2009) a lack of teachers' skills in entrepreneurship teaching is another gap to be filled. A first important step would be to have entrepreneurship as an explicit goal in the curriculum so as to devote energy and attention to its implementation. For example, project work and teamwork could be used extensively in school lessons, especially in vocational subjects. School visits to workplaces (for example building sites for surveyors) should be more frequent and structured in small groups; cooperation between school and work should be improved as well. Students should be encouraged to come up with ideas and be creative, rather than just listen to lectures. Pedagogies should be active and centred on group work, endorsing practical experiences, projects and interdisciplinary activities with the use of workshops (Bertagna, 2010; Gentili, 2013; Salatin, 2011). This could be done in every subject: humanities, scientific and technical. Traditional approaches to teaching such as lectures tend to discourage entrepreneurship in students (Heinonen & Poikkijoki, 2006). Teachers should provide personal guidance to students on how to develop and realize their goals, and offer alternative points of view. This does not mean that students should be left alone. To the contrary, learning without guidance can stagnate (Van Gelderen, 2012).

From the discussion above, it may seem that the sense of initiative is only necessary in the workplace, and school should teach for entrepreneurship simply to prepare students for working life. To the contrary, entrepreneurship can be seen as autonomy and personal initiative, and these are core competencies in every domain of life (Cárdenas Gutiérrez & Bernal Guerrero, 2011). It is clear why the sense of initiative has to be owned by every individual and why it has been classified by the European Commission as one of the eight

key competences for lifelong learning. School should thus teach for entrepreneurship and not simply do so by sending students to work in industry. Teachers should know about the knowledge, skills and habits making up the sense of initiative and entrepreneurship, and be entrepreneurial in their own practice, so as to be role models for students.

Hence, the second ZPD of the sense of initiative and entrepreneurship in vocational education is teaching for entrepreneurship in an entrepreneurial way. A possible solution to put this into practice could stem once again from the Change Laboratory. Together with the other stakeholders (representatives of the enterprise world and unions, students and school principal) teachers could discuss how to concretely implement entrepreneurship teaching in the class and in the school, and the didactic tools needed for that, thus adapting entrepreneurship teaching to the specific school context. In so doing, not only could teachers learn about entrepreneurship, they could also put it into practice, thus becoming entrepreneurial themselves.

9.3 Recommendations for educators, schools and policy makers

This study is significant in that it illustrates the challenges of boosting the competence of entrepreneurship in modern secondary schools. The following paragraphs will generalize the findings of this research and address suggestions to educators, schools and policy makers on how to improve the quality of vocational education and promote a sense of initiative and entrepreneurship.

For teachers, entrepreneurship can be taught in class with the use of diverse teaching methods such as project work, group work, and solving real problems. The use of lectures should be limited. Teachers should be supportive rather than prescriptive, and should ultimately aim to develop the students' autonomy and personal initiative.

For the employer, during work experience work tutors should be supportive and encourage the students' autonomy and personal initiative. They should stress the importance of employability skills such as: being responsible, arriving on time, asking questions, having a can do attitude, and being ready to seize the learning opportunities in the workplace. Better coordination between workplaces and schools is needed, for example in the form of Change Laboratory workshops.

Guidance on entrepreneurship should be provided to students. Moreover, every educator should stress the importance of this competence on all levels. At one level

students should be taught how to set up a business and self employment should be seen as a valid option after school certificate completion. At another level, educators should stress the importance of the sense of initiative and entrepreneurship needed to be employable and successful in the workplace. At a third level, and perhaps most importantly, the importance of the sense of initiative should be emphasised from a lifelong learning perspective in every endeavour the student will undertake: education, sport, voluntary work, private life. To do so, educators should put this competence into practice every day, thus becoming entrepreneurial and role models for students.

For schools, entrepreneurship can be taught in different ways. First, workshops, group work and project work should be encouraged as teaching tools. The use of lectures should be limited and students should be taught to develop their personal initiative and autonomy. Schools should also seek contacts in local industry and the community. This could lead to partnerships and common projects. Schools should also foster the use of long periods of work experience repeated over time and school visits.

As has been shown throughout this research, the creation of reflective spaces where students can discuss and find shared solutions to the issues they are having in the transition from school to work is important to strengthen the students' sense of initiative and entrepreneurship. To make these workshops effective, they should be held regularly during work placement, and representatives of the parties involved should take part in them: not only students and teachers, but also work tutors and the school principal. In so doing, when collective decisions are taken, there is the strength to bring about change in the different activity systems. Smaller group are most appropriate to foster students' initiative.

For policy makers, it is important that vocational education is attractive for the students and their families. The opportunities for schools to set up partnerships with local industry should be strengthened, as well as the possibility for students to spend longer periods in the workplaces. Long periods such as forty days' in the workplaces, either in a block or once a week, are needed to learn about the practices and employability skills. Entrepreneurship education is important to improve the students' opportunities after graduation from a lifelong learning perspective. The competence of the sense of initiative and entrepreneurship should become an explicit goal of the vocational curriculum. Teachers, school directors and work tutors should be trained in entrepreneurship

education. This should turn them into entrepreneurial agents and thus models for students. In so doing, the transition between school and work will be more successful and vocational education will be more attractive.

A final point concerns the sometimes difficult position of the boundary crossing student, the young person undertaking work experience. It seems that, in Marxian terms, the dialectics between the use value and the exchange value of the student-worker are patent. On the one hand there are the educational needs of the student as a person who is not yet an adult and needs to be supported and nurtured. On the other hand there is what the student is requested to do in the workplace as a worker and what the employer wants from them. With the help of the school, the right balance must found between these two poles, so that the student can be a valuable assistant in the workplace, but also learn their vocational profession and avoid encapsulation. Most importantly, during work experience students should also learn the key competencies for lifelong learning required to live in and master the problems and opportunities of a globalized society. Only then will the alliance between school and industry prepare the student to cope with the challenges driven by globalization and transform them into opportunities for everybody.

10 Conclusioni: la formazione tecnica e professionale e l'educazione all'imprenditorialità si affacciano alla loro Zona di Sviluppo Prossimo

L'educazione all'imprenditorialità come pure la formazione tecnica e professionale sono due tipi di educazione che si pongono lo scopo di migliorare l'occupabilità degli studenti in due tipi di lavoro: impiego retribuito ed in proprio (che include la creazione e conduzione di PMI). Entrambi i tipi di educazione collegano direttamente lo studio con il mercato del lavoro, allargano la possibilità di scelta per studenti e diplomati, ottimizzano l'uso del potenziale degli individui, e contribuiscono allo sviluppo comprensivo della società, sia economicamente che socialmente.

A.A. Badawi per UNESCO-UNEVOC, 2013, p. 279.

La Zona di Sviluppo Prossimo (ZSP) è un concetto vygoskiano che descrive la differenza fra quello che il bambino è in grado di fare da solo e quello che potrebbe fare con l'aiuto di un educatore o un pari più esperto (Vygotsky, 1978). Nella Teoria Storico Culturale dell'Attività (acronimo inglese CHAT) questo concetto viene allargato per comprendere sistema di attività multipli ed interagenti (Sannino & Engestrom, 2010). È così che, nel Change Laboratory, durante un ciclo di apprendimento espansivo, i partecipanti pensano alla ZSP del/i loro sistema/i di attività. Engestrom (2004b) utilizza questo concetto anche per cercare di capire il futuro della ricerca sulla competenza. In modo similare, il capitolo cercherà di capire la ZSP delle due forme complementari di educazione oggetto di questa ricerca: l'educazione all'imprenditorialità e la formazione tecnica e professionale. La citazione UNESCO sopra sottolinea i vantaggi sia per l'individuo che per la società derivanti da questi due tipi d'educazione, e manifesta l'importanza ed anche il rinnovato interesse che queste rivestono a livello internazionale.

Il capitolo riassume la ricerca; si inizia inquadrando il problema e descrivendo il progetto comparativo nelle due implementazioni. Si ripercorrono i risultati principali e si

fanno osservazioni finali sul ruolo dell'attraversamento dei confini nella moderna formazione professionale e tecnica, guardando poi alla relazione esistente tra gli approcci culturali all'imprenditorialità, il Change Laboratory e l'approccio delle capacitazioni. Il capitolo identifica possibili direzioni per la ricerca futura, esaminando così la ZSP del senso d'iniziativa e d'imprenditorialità nella formazione tecnica e professionale. Da una parte questa è una cooperazione più vicina tra scuola e mondo del lavoro, e dall'altra sono gli insegnanti che insegnano l'imprenditorialità in modo imprenditoriale. In entrambi i casi il Change Laboratory potrebbe giocare un ruolo decisivo, aumentando partecipazione e democrazia a più livelli nella scuola. Il capitolo termina con alcune raccomandazioni e indicazioni rivolte a scuole, aziende, insegnanti e policy maker.

Il ruolo dell'imprenditorialità e della formazione tecnica e professionale nelle società globalizzate

Nel capitolo introduttivo si è mostrato come in conseguenza della globalizzazione si registri uno spostamento dalle società da 'pilotate' ad 'imprenditoriali' (OECD, 2010c), ove le PMI (piccole e medie imprese) giocano un ruolo essenziale per promuovere innovazione ed occupazione. Le ricerca mostra come l'innovazione avvenga più nelle PMI che nell'R&D (ricerca e sviluppo) di grandi aziende (Audretsch, 2003). Le PMI hanno bisogno di innovare per poter rimanere sul mercato, e questa può venire sia dall'imprenditore che dai suoi lavoratori che, specialmente nelle aziende high-tech, sono diplomati che provengono da percorsi di formazione tecnica (Badawi, 2013). Inoltre la formazione professionale e tecnica si trova in una posizione ideale per supportare l'innovazione nelle PMI (Garlick et al., 2007) non solo con progetti e partenariati, ma anche fornendo agli studenti quelle competenze sia tecniche che chiave per l'apprendimento permanente richieste al tessuto produttivo locale. Sembra che più persone diplomate da istituti tecnici e professionali lavorino nelle PMI che altri tipi di diplomati (Atkinson, 2011), e che una formazione professionale e tecnica di stampo imprenditoriale possa promuovere la crescita nelle zone rurali e nelle periferie (Garlick et al., 2007).

L'era tecnologica nella quale viviamo è caratterizzata dalla società della conoscenza e dall'economia della conoscenza, e soprattutto dall'attitudine alla conoscenza (knowledge mindset) necessaria per "navigare le incertezze di oggi e gli sviluppi incerti del domani, non solo nel mercato del lavoro ma in ogni aspetto della vita" (Badawi, 2013, p. 277). Non solo i giovani dovranno essere in grado di padroneggiare le abilità e le conoscenze relative al loro

campo di studio o di lavoro, ma dovranno anche padroneggiare il cambiamento ed essere in grado di imparare dall'esperienza, di pensare criticamente ed essere autonomi.

Dal punto di vista dello sviluppo umano, Sen (1990) individua una delle funzioni precipue dell'educazione nella capacità di incrementare la abilità di ognuno all'esercizio della democrazia. Un miglioramento dei sistemi educativi si riflette su una migliore distribuzione del PIL tra gli individui, può contribuire a trasformare reddito e risorse in funzionamenti più variati, ed aiutare la persona a scegliere tra diversi modi di vivere. In ogni caso, è compito dell'educazione provvedere a che i giovani possano avere le competenze utili a vivere nella società. Due forme complementari di educazione sono state identificate per contrastare la disoccupazione giovanile; queste sono l'educazione all'imprenditorialità e la formazione tecnica e professionale. Quest'ultima dovrebbe preparare gli studenti per l'intero spettro di vita lavorativa ma, sfortunatamente, molte qualifiche professionali e tecniche sono pensate sulla base di modelli lavorativi caratterizzati dal lavoro dipendente. A tal fine, l'educazione all'imprenditorialità può aiutare lo studente ad allargare le sue prospettive lavorative, e così facendo può aumentare l'attrattività della formazione tecnica e professionale (Badawi, 2013).

Sia la formazione tecnica e professionale che l'educazione all'imprenditorialità dovrebbero essere studiate secondo un approccio basato sulle capacitazioni. Anche se l'imprenditorialità può contribuire alla crescita economica, non è detto necessariamente che questa si traduca in sviluppo umano (Gries & Naudé, 2011): visto secondo l'approccio delle capacitazioni di Sen, reddito e benessere (come pure crescita economica e tecnologica) rendono solo parzialmente conto dello sviluppo umano, che invece riguarda l'espansione positiva delle libertà individuali. Così, l'aggettivo 'positivo' dovrebbe essere utilizzato quando si parla d'imprenditorialità, che concerne l'individuazione e lo sfruttamento di opportunità 'positive' creando così valore sia per l'individuo che per la comunità.

L'utilizzo di un approccio centrato sulle capacitazioni nell'educazione tecnica e professionale permette di andare oltre la ricerca di insiemi statici e stabiliti a priori di abilità reputate necessarie per l'esercizio di una determinata professione, e non si concentra sul mero ottenimento di titoli (entitlements). Piuttosto, esso si focalizza sull'abilità dello studente di operare giudizi complessi sia sul posto di lavoro che al di fuori di esso (Wheelahan & Moodie, 2011). La centralità del soggetto con la sua libertà di fare

viene cosi messa in primo piano: grazie all'agency basata sulle capacitazioni acquisite, l'individuo diviene il fulcro dello sviluppo sociale ed economico, questa volta realmente inclusivo, sostenibile ed intelligente (Costa, 2012). La formazione professionale dovrebbe dunque cercare di qualificare le capacitazioni ed i funzionamenti dello studente che sono importanti per gli individui, i gruppi e le comunità. Questo processo comprende un dialogo pubblico tra i diversi attori, ma anche metodi di ricerca partecipativi (Tikly, 2013): ecco dunque che gli spazi dove le persone possono discutere e prendere decisioni sono di particolare valore per incrementare le loro capacitazioni (Costa, 2012).

La storia sin qui …

Questo studio ha esaminato come qualificare il senso d'iniziativa e d'imprenditorialità in studenti inseriti in corsi professionali o tecnici in due avanzate economie OCSE post-industriali quali Australia ed Italia. Il punto di partenza è stato l'applicazione di un tipo di laboratorio, il Change Laboratory, per l'insegnamento dell'imprenditorialità in studenti inseriti in lunghi periodi di alternanza scuola lavoro. Il framework scelto per questo studio è quello di CHAT, ove la teoria dell'apprendimento espansivo rende conto delle decisioni ed apprendimenti collettivi, come pure del cambiamento sociale.

In linea con CHAT e la teoria dell'apprendimento espansivo, il focus della ricerca è stato allargato oltre la dimensione individuale per comprendere intere organizzazioni; la scuola ed il lavoro sono considerati come due sistemi di attività con diverse finalità, ma aventi come obiettivo comune la trasformazione dello studente in professionista. Durante i periodi di alternanza scuola lavoro gli studenti visti come membri attivi dei sistemi di attività ai quali appartengono attraversano i confini tra scuola e lavoro, e sono per questo latori di innovazione.

Le ricerche spiegano come un evento scatenante sia necessario per mobilizzare il senso d'iniziativa e d'imprenditorialità dello studente (Heinon & Poikkijoki, 2006). Nello studio presente questi è stato un problema importante trovato dagli studenti durante l'attraversamento dei confini, e spesso dovuto all'appartenenza simultanea a due sistemi di attività con elementi che configgevano tra loro, con diverse regole, divisione del lavoro, comunità, strumenti ed oggetto del sistema di attività. In CHAT i problemi ai confini sono considerati come risorse per lo sviluppo dello stesso sistema di attività.

In Australia la ricerca si è concentrata su una qualifica professionale di terzo livello in Cura del Bambino organizzato da un Centro di Formazione Accreditato e da un college

cattolico di Melbourne. In Italia il progetto è stato condotto in un istituto tecnico statale per geometri situato in una piccola città lombarda. In entrambi i casi gli studenti, che avevano un'età compresa tra i 16 ed i 19 anni, sono stati collocati per lunghi periodi nelle aziende, in un caso per due mesi continuativi, mentre nell'altro un giorno a settimana per un anno intiero. Il confronto tra queste diverse ambientazioni – Italia vs. Australia, educazione tecnica vs. professionale, stage intensivo vs. 'diluito' nel tempo, ristretto novero contro numero più consistente di partecipanti - ha fornito criteri variati per studiare come differenti realtà significano e interpretano lo stesso concetto, il senso d'iniziativa e d'imprenditorialità.

Durante i Change Laboratory gli studenti, assieme ad insegnanti e tutor aziendali, ed aiutati dai materiali mirror come pure dal ricercatore, hanno discusso i problemi che si presentavano a scuola, a lavoro o all'intersezione fra i due sistemi. Insieme, i partecipanti hanno trovato soluzioni condivise e le hanno messe in pratica, aumentando così la loro capacità di trasformare le idee in azione, che corrisponde all'elemento chiave del senso d'iniziativa e d'imprenditorialità. In Australia i problemi con cui gli studenti hanno dovuto confrontarsi sono stati il continuo susseguirsi di nuovi insegnanti ed un direttore di un centro per l'infanzia che affermava che le sue apprendiste studentesse mancavano di abilità relative all'occupabilità (employability skills). In Italia, invece, solo gli studenti partecipanti nel progetto hanno potuto fruire di uno stage prolungato di due mesi; conseguentemente gli insegnamenti sono andati avanti col programma nel resto delle classi,e gli studenti che hanno preso parte alla ricerca si sono sentiti lasciati indietro.

I risultati d'apprendimento dell'intera esperienza sono stati raccolti attraverso un questionario di follow-up composto da una parte qualitativa ed una quantitativa. Nella parte quantitativa gli studenti hanno risposto a domande a scelta multipla sulle componenti della settima competenza chiave europea sul senso d'iniziativa e d'imprenditorialità, conoscenze, abilità e attitudini (European Commission, 2007). Le conoscenze ed abilità sono state descritte sulla base del livello EQF appropriato, il più delle volte rappresentato dal livello di autonomia sul posto di lavoro. La parte qualitativa del questionario ha invece cercato di comprendere l'atteggiamento dei partecipanti verso il Change Laboratory come mezzo di cambiamento sociale, come pure il significato attribuito al senso d'iniziativa ed imprenditorialità. Ulteriori prodotti d'apprendimento dei laboratori sono stati i cartelloni disegnati collettivamente dagli studenti ed analizzati come concetti mentali condivisi che precedono l'azione (Engestrom et al., 2005). In Australia gli studenti

hanno prodotto due cartelloni, uno sulla perfetta insegnante e l'altro sulle mutue aspettative sul posto di lavoro. In Italia gli studenti hanno disegnato tre cartelloni, uno sulla propositività sul posto di lavoro, mentre gli altri due sull'esperienza ideale di stage.

10.1 Risultati principali della ricerca:

- La combinazione di lezioni in classe, stage e Change Laboratory ha aumentato la competenza europea riguardante il senso d'iniziativa ed imprenditorialità fino ad un livello EQF 4 (sapersi gestire autonomamente, nel quadro di istruzioni, in un contesto di lavoro o di studio, di solito prevedibili, ma soggetti a cambiamenti) in studenti di scuola secondaria superiore iscritti a corsi professionali o tecnici, e che attraversavano i confini tra scuola e lavoro. Due abilità del senso d'iniziativa e d'imprenditorialità sono parse particolarmente connesse al Change Laboratory: saper comunicare le idee agli altri e lavorare in gruppo. Il livello di competenza acquisita secondo il quadro EQF sembra anche dipendere dal tipo di professione che lo studente sta imparando;
- Dalla partecipazione al Change Laboratory gli studenti hanno acquisito una migliore comprensione delle pratiche lavorative e del punto di vista delle altre parti. Questo ha portato ad una dimensione collettiva di riflessione: durante i laboratori i partecipanti hanno potuto pensare a come migliorare le proprie condotte sul posto di lavoro e come mostrare più senso d'iniziativa (fare domande, iniziare, provare, essere proattivi ed avere un'attitudine positiva) aumentando così la loro esperienza d'apprendimento e le abilità connesse all'occupabilità (employability skills). Un altro risultato dei laboratori è stata una migliorata comunicazione fra le parti come pure una migliorata agency;
- Ci sono due categorie di vantaggi, fattuali e relazionali, dalla partecipazione al Change Laboratory applicato all'insegnamento dell'imprenditorialità. Da un lato i partecipanti hanno discusso e risolto assieme i problemi che si sono presentati; dall'altro hanno migliorato le relazioni fra le parti. I benefici fattuali includono il feed-back attivo tra le parti e le migliorate abilità degli studenti; i vantaggi relazionali sono invece: l'aver lavorato insieme per risolvere i problemi, la possibilità di discutere ogni problema e di proporre le proprie idee. Data la flessibilità del Change Laboratory, i vantaggi variano a seconda del setting, per esempio avvicinare la scuola ed il lavoro, ovvero migliorare il programma del corso;

- Benché molti partecipanti non abbiano trovato svantaggi dalla partecipazione al Change Laboratory, dato che ogni problema poteva essere discusso, le debolezze emerse sono state fondamentalmente organizzative: per esempio più studenti - della stessa classe, ma anche di tutta la scuola - avrebbero dovuto partecipare; ci sarebbero dovuti essere più incontri e spalmati lungo tutto l'anno scolastico. Un'altra fonte di difficoltà è venuta dalla partecipazione: non tutti gli studenti sono intervenuti e talvolta hanno avuto l'impressione che i loro interventi fossero travisati. Un ultimo gruppo di problemi sono stati classificati come intrinseci al Change Laboratory, e sono essenzialmente dovuti alla sua 'multivocità' intesa come presenza di voci discordanti, talvolta contrapposte: alle volte è stato difficile trovare soluzioni condivise, e più incontri sarebbero stati necessari. I suggerimenti su come migliorare l'esperienza composta da lezioni, stage e Change Laboratory hanno puntato ad una maggiore integrazione e coordinamento tra gli ambienti scuola e lavoro.

10.2 Considerazioni finali

L'importanza dell'attraversamento dei confini nella formazione professionale e tecnica per sostenere la competenza dello studente

Il framework teorico utilizzato in questa ricerca, la Teoria Storico Culturale dell'Attività, aiuta a guardare alla scuola come ad un sistema in interazione dinamica con i sistemi di attività confinanti come le aziende (Ajello et al., 2005); poiché l'oggetto dell'attività è diverso, anche le regole la divisione del lavoro, la comunità e gli strumenti saranno diversi. Questo spiega perché le competenze imparate in un contesto sono dissimili e non immediatamente mobilizzabili in altre situazioni. Tuttavia, anche se con differenze, i sistemi di attività scuola ed impresa condividono un obiettivo comune, cioè l'apprendimento dello studente (Akkerman & Bakker, 2012). Lo sviluppo della professionalità vista come obiettivo condiviso aiuta a considerare le interdipendenze evitando l'incapsulamento (Engestrom, 1991), cioè conoscenze o skills che non possono essere facilmente ricontestualizzate[1] in altri sistemi di attività, come per esempio alcune conoscenze teoriche che vengono impartite a scuola oppure abilità troppo specifiche sul posto di lavoro. In entrambi i casi queste non danno origine a competenza, visto che non

[1] Questa terminologia è stata utilizzata per prima da Van Oers (1998) per indirizzare il problema del trasferimento della conoscenza tra contesti.

possono essere usate per risolvere problemi in nuove situazioni. Per ovviare all'incapsulamento di conoscenze e skill l'educazione tecnica e professionale dovrebbe fornire agli studenti la possibilità di sperimentarsi in una varietà di contesti ove queste possano essere mobilizzate per essere così trasformate in competenza.

L'attraversamento dei confini porta a superare il problema dell'incapsulamento, poiché implica una visione diversa del trasferimento di conoscenza che include azioni continue e bidirezionali ed intersezioni tra pratiche (Saljo, 2003); gli studenti non sono solo visti come gli ultimi arrivati pronti ad essere socializzati alle nuove pratiche, ma membri attivi che possono contribuire a plasmare l'ambiente ed a innovarlo. Così, la competenza vista come attraversamento dei confini è particolarmente utile per quei contesti di lavoro come quello dei geometri dove i problemi sono spesso nuovi e la competenze devono essere ricontestualizzate per poter essere effettive. Per poter svolgere le loro attività negli uffici di progettazione, nei siti in costruzione, negli uffici del Comune, della Provincia o al Catasto, i geometri spesso formano gruppi 'ad hoc' con professionisti provenienti da altre organizzazioni quali architetti, ingegneri, costruttori ed altri. Lo stesso modello è ugualmente utile nella formazione professionale alla cura del bambino, anche se i problemi possono sembrare meno variati, se è vero che i bambini hanno bisogno di ambienti più stabili ove crescere. In ogni caso, le insegnanti d'asilo devono interfacciarsi con parecchie figure professionali ed essere in grado di padroneggiare nuove situazioni, avendo a che fare con una clientela in costante cambiamento e con bisogni sempre nuovi e variati.

Dunque imparare a far fronte al cambiamento è l'obiettivo dell'attraversamento dei confini: al giorno d'oggi gli studenti devono lavorare in organizzazioni mutevoli e flessibili, caratteristica tipica del mondo globalizzato. A tal proposito Engestrom (2008a) suggerisce che "i gruppi di lavoro stabili sono sempre più spesso sostituiti da forme fluide fatte di nodi (knots) che lavorano intorno ad oggetti sfuggenti (runaway objects), che richiedono e generano nuove forme di apprendimento espansivo ed agency distribuita". L'attraversamento dei confini cerca di trovare modalità produttive per mettere in relazione pratiche dissimili che si intersecano fra loro (Akkerman & Bakker, 2012).

Fenomeni come la globalizzazione, la società della conoscenza, nuove forme di produzione e di organizzazione hanno dunque creato il contesto per un nuovo tipo di relazione tra scuola e mondo del lavoro (Stenstrom & Tynjala, 2009). L'utilizzo di forme di

esperienza lavorativa protratta nel tempo è uno dei più importanti sviluppi nella formazione tecnica e professionale, tanto che lo stage dovrebbe essere considerato metodologia incorporata all'educazione scolastica piuttosto che esterna ad essa.

Approcci culturali all'imprenditorialità, approccio delle capacitazioni e Change Laboratory

Questo paragrafo analizza la convergenza esistente tra l'approccio culturale all'imprenditorialità di Kyro, il Change Laboratory di Engestrom et al., nonché l'approccio delle capacitazioni di Sen.

Il primo elemento comune tra il Change Laboratory e l'approccio delle capacitazioni è l'importanza data all'agency[2] del soggetto. Non vi sono dubbi che la dimensione agentiva è quella principale che caratterizza il senso d'iniziativa e d'imprenditorialità in entrambi i contesti della ricerca. Un evento scatenante è necessario per l'insegnamento dell'imprenditorialità per attivare l'agency dei partecipanti. Durante i Change Laboratory i materiali mirror e la discussione intendono mobilitare l'agency individuale; i partecipanti arrivano ad un punto dove si convincono che qualcosa deve essere fatto per cambiare lo stato delle cose. Secondo Sannino (2011a) l'agency caratterizza il Change Laboratory con i due suoi principi epistemologici, l'ascesa dall'astratto al concreto e la doppia stimolazione; nell'approccio delle capacitazioni, invece, l'agency è visto come 'agenzia umana' e caratterizza l'abilità degli individui di lavorare verso gli scopi che essi considerano di valore (Alkire, 2005): dunque l'agency è ingrediente chiave del cambiamento sociale positivo.

Oltre all'agency, il Change Laboratory e l'approccio basato sulle capacitazioni condividono assieme all'approccio culturale all'imprenditorialità l'importanza data al collegamento fra l'individuo ed il sociale più ampio considerato come collettività. Il Change Laboratory per esempio collega la dimensione individuale a quella collettiva attraverso lo sforzo collettivo per cambiare lo stato presente delle cose; il triangolo di Engestorm (1987) è utilizzato per l'analisi dei punti critici del/i sistema/i di attività. Attraverso l'analisi delle interconnessioni, il triangolo collega il soggetto con il sistema di attività, le regole, la divisione del lavoro e la comunità; in tal modo l'analisi è portata avanti parallelamente da un punto di vista individuale e collettivo. Secondo l'approccio culturale di Kyro (2006), invece, l'educazione all'imprenditorialità può essere studiata da un punto di vista individuale e collettivo e questi sono così interconnessi da non essere separabili. In modo

[2]Dal dizionario di lingua inglese, “lo stato dell'essere in azione o di esercitare potere”.

similare all'approccio culturale dell'imprenditorialità, anche l'approccio delle capacitazioni sottolinea il mutuo costituirsi tra l'individuo ed il sociale: nella sua quintessenza la libertà individuale è prodotto sociale (Sen, 1999). Come suggerisce Costa (2012), il collegamento tra l'individuo ed il collettivo è basato nella fiducia nel 'logos', cioè nelle pratiche discorsive e nella capacità di riflessione sulle proprie condotte. Nel presente studio la dimensione individuale e collettiva sono intrecciate anche nei risultati d'apprendimento: cartelloni prodotti dai gruppi e questionari completati individualmente, ed i poster hanno richiamato molti elementi espressi individualmente nelle risposte aperte.

Un terzo punto in comune tra i tre approcci è il concentrarsi sulla partecipazione per trasformare o generare nuove pratiche. Kyro (2006) afferma che l'approccio culturale all'imprenditorialità si ispira allo sviluppo economico, alla democrazia ed al liberalismo. L'imprenditorialità è particolarmente necessaria in alcuni periodi della storia quando si sente il bisogno di transizioni culturali e le idee di libertà diventano essenziali per il successo della società stessa; in tali periodi di mutamenti l'imprenditorialità porta il cambiamento con la creazione di nuove pratiche e la trasformazione di vecchi sistemi ed istituzioni. Anche per CHAT i periodi di fermento culturale ed il bisogno di rinnovare le pratiche sono essenziali: seguendo l'eredità vygotskiana e l'idea marxiana di pratica rivoluzionaria (Sannino, 2011a) il Change Laboratory intende trasformare le pratiche sociali. Marx è pure considerato uno fra gli ispiratori dell'approccio delle capacitazioni di Sen. Nel suo libro sugli standard di vita, Sen (1984) afferma che è possibile concentrarsi sulle capacitazioni dell'individuo e sulle libertà individuali come indicatori di standard di vita, e che questa asserzione è molto vicina alla preoccupazione sulla libertà degli individui ricorrente in Marx, e riassunta dall'affermazione: "sostituire lo strapotere delle circostanze sugli individui dalla dominazione degli individui sul caso e sulle circostanze" (Marx in Sen, 1982, p. 296). In relazione al bisogno di cambiamento sociale, Sen suggerisce che agli individui deve poter essere data la possibilità di plasmare il proprio futuro anziché venir considerati passivi beneficiari "di astuti programmi di sviluppo" (Sen citato in Alkire, 2005, p. 218).

Tanta importanza al cambiamento sociale attraverso processi democratici a tutti i livelli è particolarmente importante nella scuola, dove ad attività ripetitive come le lezioni frontali dovrebbero essere affiancati spazi inclusivi dove gli studenti possano contribuire attivamente a modellare le pratiche dei quali essi stessi sono parte. Questi processi democratici enfatizzano i valori condivisi che emergono da una partecipazione attiva alla

discussione: i diversi punti di vista diventano un valore ed una risorsa per portare innovazione e creare capacitazioni per nuovi funzionamenti.

Al giorno d'oggi non è più sufficiente proporre un percorso formativo predeterminato, anche se fosse il più indicato per lo specifico studente: gli alunni hanno bisogno di spazi partecipativi dove possono riflettere e discutere i problemi per loro importanti, così da poter prendere decisioni informate. Oltre a generare nuove opportunità, questo processo espande le libertà positive dell'individuo, l'autonomia e l'iniziativa personale. Un sistema educativo inclusivo dovrebbe pertanto incorporare questo processo: se da un lato è vero che lo studente dovrebbe agire come 'un piccolo imprenditore di se stesso', è vero anche che non dovrebbe essere incolpato quando fallisce nel percorso che si è scelto. Per questo un sistema educativo inclusivo dovrebbe cercare di comprendere quali parti del processo non hanno permesso allo studente di riuscire in quello che aveva ritenuto importante per sé.

Qual'è la ZSP del senso d'iniziativa e d'imprenditorialità nella formazione tecnica e professionale?

I paragrafi sopra hanno messo in particolare risalto l'importanza di relazioni coese tra scuola e mondo del lavoro per arrivare ad un punto dove lo stage è visto come parte della formazione scolastica. Una prima ZSP del senso d'iniziativa e d'imprenditorialità nella formazione tecnica e professionale è costituita da relazioni fra scuola ed mondo del lavoro sempre più vicine ed intrecciate, viste in termini di: partenariati, progetti condivisi, studenti che lavorano nell'industria per lunghi periodi, programmi di scambio per lavoratori che vanno a scuola ed insegnanti che vanno nel mondo del lavoro, imprenditori che visitano scuole di frequente e fanno lezione. Il fatto che scuola ed industria lavorino mano nella mano per formare lo studente dovrebbe essere visto come lavoro al confine piuttosto che confini che si dissolvono: è al confine che l'innovazione giace, e differenze e problemi sono visti come fonte d'apprendimento e di cambiamento positivo.

I Change Laboratory si sono dimostrati un valido aiuto per permettere ai rappresentanti dei vari sistemi di attività di discutere i problemi ai confine, e trovare soluzioni condivise in processi decisionali allargati. Come sottolineano Pontecorvo, Ajello e Zucchermaglio (2004) è dalla discussione che emerge l'apprendimento. Il problem solving creativo e la riflessione sono due princìpi intimamente interconnessi che caratterizzano il Change Laboratory: quanto più i processi di interiorizzazione del problema diventano

riflessione critica, tanto più può accrescersi l'esternalizzazione intesa come ricerca di soluzioni innovative (Ajello et al., 2005). Un'altra ragione per implementare un Change Laboratory è che le pratiche riflessive possono aver luogo solo tramite la soluzione di problemi di situazioni di vita reali (Costa, 2011); l'azione competente dell'individuo è data dalla sua capacità di aumentare le possibilità di scelta attraverso la risoluzione di problemi; il risultato è la generazione di nuove connessioni creative e possibilità di riflessione critica. Anche il modello della pedagogia integrativa (Tynjala & Gijbels, 2012) sottolinea l'importanza della conoscenza riflessiva e del problem solving progressivo, in quanto entrambi facenti parte della competenza professionale necessaria nelle società odierne caratterizzate da tanta mutevolezza. Nel suddetto modello, la conoscenza riflessiva è una delle quattro componenti della competenza professionale; le altre tre sono: teorica, pratica e socioculturale; il processo progressivo di risoluzione dei problemi è visto come il collante di questi tipi di conoscenza, quello che le trasforma in competenza.

Come già sottolineato dalla Commissione Europea (2009), la capacità del corpo docente di educare all'imprenditorialità è un obiettivo ancora non raggiunto appieno; un primo importante passo in questa direzione è che la competenza relativa al senso d'iniziativa e d'imprenditorialità diventi obiettivo esplicito del curricolo così da poter impiegare energie per la sua realizzazione. Il lavoro in gruppi e/o per progetti potrebbe così venir utilizzato estensivamente durante le lezioni, specialmente (ma non solo) nelle materie tecniche o professionali; le visite scolastiche sui posti di lavoro (per esempio siti in costruzione per i geometri) dovrebbero diventare frequenti ed essere strutturate in piccoli gruppi; la cooperazione tra scuola e mondo del lavoro dovrebbe essere rafforzata; gli studenti dovrebbero essere incoraggiati a proporre idee ed a essere creativi piuttosto che semplicemente ad ascoltare lezioni. La didattica dovrebbe essere attiva e centrata sul lavoro di gruppo, favorendo esperienze pratiche, progetti ed interdisciplinarità con l'utilizzo dei laboratori (Bertagna, 2010; Gentili, 2013; Salatin, 2011). Tutto questo potrebbe essere fatto in ogni materia: umanistica, scientifica o tecnica. Gli approcci tradizionali all'imprenditorialità come la lezione frontale tendono infatti a scoraggiare lo spirito imprenditoriale (Heinonen & Poikkijoki, 2006). Inoltre, gli insegnanti dovrebbero fornire una guida personalizzata su come sviluppare e realizzare gli obiettivi degli studenti offrendo quando necessario punti di vista alternativi; questo non significa lasciarli soli durante i loro percorsi di apprendimento; al contrario, l'apprendimento senza guida potrebbe arenarsi (Van Gelderen, 2012).

Dai paragrafi sopra potrebbe sembrare che il senso d'iniziativa e d'imprenditorialità sia necessario solo sul posto di lavoro e che la scuola debba promuovere questa competenza per preparare gli studenti alla vita lavorativa. Al contrario, l'imprenditorialità può essere vista come autonomia ed iniziativa personale, entrambe doti essenziali in ogni campo della vita (Cárdenas Gutiérrez & Bernal Guerrero, 2011); è chiaro dunque perché il senso d'iniziativa debba essere posseduto da ciascun individuo, e come esso sia annoverato dalla commissione europea tra le otto competenze chiave per l'apprendimento permanente. La scuola dovrebbe dunque insegnare l'imprenditorialità, e non semplicemente inviando gli studenti presso le aziende: gli insegnanti dovrebbero sapere le componenti di questa competenza: conoscenze, abilità ed atteggiamenti, ed essere imprenditoriali nelle loro stesse pratiche, così da porsi come modelli.

In tal modo si giunge alla seconda ZSP del senso d'iniziativa e d'imprenditorialità nella formazione tecnica e professionale, che è insegnare l'imprenditorialità in modo imprenditoriale. Una soluzione possibile per mettere in pratica questa seconda direzione per la ricerca potrebbe venire ancora una volta dal Change Laboratory: assieme agli altri detentori di diritti (per esempio rappresentanti delle imprese, dei sindacati, degli studenti e della dirigenza scolastica) gli insegnanti potrebbero discutere come implementare concretamente l'insegnamento dell'imprenditorialità in classe con gli strumenti didattici necessari, adattando così l'insegnamento di questa competenza allo specifico contesto scolastico e territoriale. Facendo questo, non solo gli insegnanti potrebbero apprendere cos'è l'imprenditorialità, ma, mettendola in pratica, potrebbero essi stessi diventare imprenditoriali.

10.3 Raccomandazioni per educatori, scuole e policy maker

L'importanza di questo studio risiede dall'illustrare le sfide poste dal miglioramento della competenza relativa al senso d'iniziativa e d'imprenditorialità in moderne istituzioni secondarie; a tal fine i prossimi paragrafi cercheranno di generalizzare i risultati della ricerca e di fornire consigli ad educatori, scuole e policy maker su come migliorare la qualità del sistema formativo tecnico e professionale attraverso la promozione del senso d'iniziativa e d'imprenditorialità.

Per gli insegnanti, la competenza relativa all'imprenditorialità può essere sviluppata anche in classe con l'uso di metodologie didattiche variate come il lavoro per progetti, il

lavoro per gruppi ed la risoluzione di problemi reali. L'uso della lezione frontale dovrebbe essere limitato, ed il docente dovrebbe supportare piuttosto che prescrivere, avendo come obiettivo finale l'autonomia e l'iniziativa personale dello studente.

Per il mondo del lavoro, anche i tutor aziendali nei periodi di stage dovrebbero supportare ed incoraggiare l'autonomia dello studente come pure la sua iniziativa personale. L'importanza delle abilità relative all'occupabilità dovrebbe essere evidenziata: l'essere responsabile, arrivare in orario, fare domande, avere un atteggiamento positivo (can do attitude, 'posso farlo anch'io'), essendo pronti a cogliere le opportunità di apprendimento che il posto di lavoro offre. Sarebbe inoltre necessario un coordinamento tra scuola e posti di lavoro, per esempio grazie al Change Laboratory.

Lo studente dovrebbe inoltre poter essere orientato e supportato allo sviluppo dell'imprenditorialità. Ogni educatore dovrebbe evidenziare l'importanza di questa competenza ad ogni livello: ad un primo livello gli studenti potrebbero imparare come creare un'impresa, e come il mettersi in proprio dopo il diploma possa essere una valida alternativa al lavoro dipendente. Ad un secondo livello, gli educatori dovrebbero ribadire l'importanza del senso d'iniziativa e d'imprenditorialità per la piena occupabilità ed affermazione sul posto di lavoro. Ad un terzo livello, forse il più importante, il senso d'iniziativa e d'imprenditorialità dovrebbero essere considerati in un'ottica di apprendimento permanente in ogni azione che lo studente desidera intraprendere: studio, sport, lavoro volontario, vita privata. Per far ciò, gli educatori dovrebbero provare a favorire la messa in atto questa competenza ogni giorno così da diventare imprenditoriali essi stessi ed assurgere a modelli.

Per le scuole, l'imprenditorialità può essere insegnata in modi diversi: laboratori, lavori di gruppo e/o per progetti dovrebbero essere incoraggiati come strumenti d'insegnamento. L'uso delle lezioni dovrebbe essere limitato e agli studenti si dovrebbe insegnare come sviluppare la propria autonomia ed iniziativa personale. Le scuole dovrebbero sviluppare i propri contatti con il tessuto produttivo locale che potrebbe portare a partenariati e progetti condivisi. Infine si dovrebbero promuovere visite guidate nei posti di lavoro come pure periodi di alternanza prolungati e ripetuti nel tempo presso le aziende locali.

Come si è dimostrato in questa ricerca, la creazione di spazi riflessivi dove gli studenti possono discutere e trovare soluzioni condivise per problemi che si trovano ad affrontare

tra scuola e lavoro permette di promuovere il senso di iniziativa e d'imprenditorialità dello studente. Per essere più efficaci, i laboratori si dovrebbero tenere con cadenza regolare, ed i vari rappresentanti delle parti dovrebbero essere coinvolti: non solo dunque studenti ed insegnanti, ma anche tutor lavorativi e persino dirigenza; in tal modo, quando le decisioni collettive sono prese, c'è la capacità di metterle in pratica. Gruppi più piccoli sono migliori per l'accrescimento di questa competenza.

Per i policy maker è importante che l'educazione tecnica e professionale sia attraente per studenti e famiglie; per questo le scuole dovrebbero essere messe nelle condizioni di supportare le imprese del tessuto produttivo locale, e dovrebbero dare l'opportunità agli studenti di poter effettuare più percorsi di stage; periodi quali quaranta giorni lavorativi, sia in un'esperienza continuativa che dilazionata nel tempo, sono necessari per capire le pratiche lavorative ed imparare le skills relative all'occupabilità. L'educazione all'imprenditorialità è particolarmente importante per accrescere le opportunità lavorative dopo il diploma anche nella prospettiva di apprendimento permanente; per questo la competenza relativa al senso d'iniziativa e d'imprenditorialità dovrebbe essere un obiettivo esplicito di ogni curricolo tecnico o professionale. Gli insegnanti, direttori scolastici, e tutor aziendali dovrebbero essere formati a questa competenza per far sì che possano diventare imprenditoriali e perciò modelli per i loro studenti. Così facendo, la transizione tra scuola e mondo del lavoro sarebbe più lineare, e la formazione professionale e tecnica diventerebbe un'opzione più attrattiva.

Un'ultima nota riguarda la talvolta difficile posizione in cui gli studenti che attraversano i confini si vengono a trovare come giovani individui che fanno il loro ingresso nel mondo del lavoro. Sembra che, da un punto di vista Marxiano, il conflitto tra il valore d'uso dello studente e quello di scambio sia patente: da un lato questi giovani hanno i bisogni educativi di persone non ancora adulte, e come tali devono essere supportati ed allevati; dall'altro lato ci sono le richieste esercitate sullo stagista dal posto di lavoro e quello che il datore di lavoro gli/le richiede di fare. Con l'aiuto dell'istituzione scolastica, una giusta sintesi può essere trovata tra i due estremi sicché lo studente possa essere un valido contributo sul posto di lavoro, ma possa anche imparare la professione evitando l'incapsulamento di conoscenze ed abilità. Solo allora l'alleanza tra scuola ed impresa preparerà lo studente a fronteggiare le sfide poste da un mondo globalizzato trasformandole in opportunità per tutti.

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Appendice. Results of the questionnaires

Italy

This part reports the data of the questionnaire administered to the sample of 13 Italian students participating in the Change Laboratory.

Knowledge

	EUROPEAN COMPETENCE ON THE SENSE OF INITIATIVE AND ENTREPRENEURSHIP	Improvement in the two months' experience	Perceived level according to EQF levels	Importance attributed for ones' professional growth
Knowledge				
1	Services for students in my school	7 Not at all 3 A little bit 3 Somewhat 0 Very much	4 Level 2 8 Level 3 1 Level 4 0 Level 5	0 Not important 6 A little bit 2 Somewhat 5 Very much
2	Professional Practices at my work place	0 Not at all 0 A little bit 5 Somewhat 8 Very much	1 Level 2 2 Level 3 9 Level 4 1 Level 5	0 Not important 0 A little bit 5 Somewhat 8 Very much
3	Job opportunities and contraints	0 Not at all 0 A little bit 10 Somewhat 3 Very much	2 Level 2 5 Level 3 6 Level 4 0 Level 5	0 Not important 0 A little bit 9 Somewhat 4 Very much
4	Available Job opportunities once graduated	0 Not at all 3 A little bit 10 Somewhat 0 Very much	2 Level 2 8 Level 3 2 Level 4 1 Level 5	0 Not important 0 A little bit 7 Somewhat 6 Very much
5	Social and moral role of the industry area	0 Not at all 1 A little bit 7 Somewhat 5 Very much	3 Level 2 7 Level 3 1 Level 4 2 Level 5	1 Not important 1 A little bit 8 Somewhat 3 Very much

Skills

	EUROPEAN COMPETENCE ON THE SENSE OF INITIATIVE AND ENTREPRENEURSHIP	Improvement in the two months' experience	Perceived level according to EQF	Importance attributed for ones' professional growth
Skills				
1	Project Work	0 Not at all 2 A little bit 5 Somewhat 6 Very much	0 Level 1 2 Level 2 10 Level 3 1 Level 4	0 Not important 0 A little bit 2 Somewhat 11 Very much
2	Planning	1 Not at all 3 A little bit 6 Somewhat 2 Very much	2 Level 1 3 Level 2 4 Level 3 4 Level 4	0 Not important 1 A little bit 3 Somewhat 9 Very much
3	Problem solving	0 Not at all 4 A little bit 9 Somewhat 0 Very much	0 Level 1 3 Level 2 5 Level 3 5 Level 4	0 Not important 0 A little bit 4 Somewhat 9 Very much
4	Communicate my ideas	1 Not at all 3 A little bit 4 Somewhat 5 Very much	0 Level 2 5 Level 3 7 Level 4 1 Level 5	0 Not important 0 A little bit 2 Somewhat 11 Very much
5	Negotiate a solution	2 Not at all 6 A little bit 4 Somewhat 1 Very much	2 Level 2 7 Level 3 3 Level 4 0 Level 5	1 Not important 2 A little bit 3 Somewhat 8 Very much
6	Teamwork	1 Not at all 1 A little bit 7 Somewhat 4 Very much	2 Level 2 2 Level 3 8 Level 4 0 Level 5	0 Not important 2 A little bit 5 Somewhat 6 Very much
7	Self-organize school and work activities	1 Not at all 5 A little bit 5 Somewhat 1 Very much	0 Level 1 2 Level 2 7 Level 3 3 Level 4	0 Not important 1 A little bit 5 Somewhat 6 Very much

Habits

	EUROPEAN COMPETENCE ON THE SENSE OF INITIATIVE AND ENTREPRENEURSHIP	Improvement in the two months' experience	Perceived level	Importance attributed for ones' professional growth
Habits				
1	Self confidence	1 Less than Before 1 Like before 10 A little bit more 1 Much more	0 Non Existent 1 week 7 Good 4 Excellent	0 Not important 3 A little bit 3 Somewhat 6 Very much
2	Creativity	0 Less than Before 6 Like before 4 A little bit more 3 Much more	1 Non Existent 0 week 8 Good 4 Excellent	0 Not important 1 A little bit 5 Somewhat 7 Very much
3	Take the initiative	0 Less than Before	0 Non Existent	0 Not important

		2 Like before 10 A little bit more 1 Much more	1 week 9 Good 3 Excellent	0 A little bit 3 Somewhat 10 Very much
4	Risk taking	0 Less than Before 2 Like before 8 A little bit more 3 Much more	0 Non Existent 0 week 6 Good 7 Excellent	0 Not important 0 A little bit 5 Somewhat 8 Very much
5	Perseverance	0 Less than Before 2 Like before 7 A little bit more 4 Much more	0 Non Existent 2 week 3 Good 8 Excellent	0 Not important 0 A little bit 3 Somewhat 10 Very much
6	Resourcefulness	0 Less than Before 6 Like before 6 A little bit more 1 Much more	0 Non Existent 1 week 11 Good 1 Excellent	0 Not important 0 A little bit 4 Somewhat 9 Very much
7	Self-management	0 Less than Before 3 Like before 7 A little bit more 3 Much more	0 Non Existent 2 week 6 Good 5 Excellent	0 Not important 2 A little bit 5 Somewhat 6 Very much
8	Judge my own strengths and weaknesses	0 Less than Before 5 Like before 7 A little bit more 1 Much more	0 Non Existent 2 week 6 Good 5 Excellent	0 Not important 3 A little bit 4 Somewhat 6 Very much

Australia

This part reports the data of the questionnaire administered to the sample of 4 Australian students participating in the Change Laboratory.

Knowledge

EUROPEAN COMPETENCE ON THE SENSE OF INITIATIVE AND ENTREPRENEURSHIP		Improvement in the two months' experience	Perceived level according to the EQF	Importance attributed for ones' professional growth
Knowledge				
1 1	Services for students in my school	1 Not at all 1 A little bit 2 Somewhat 0 Very much	2 Level 2 1 Level 3 1 Level 4 0 Level 5	0 Not important 0 A little bit 1 Somewhat 3 Very much
2 2	Professional Practices at my work place	0 Not at all 1 A little bit 0 Somewhat 3 Very much	0 Level 2 0 Level 3 3 Level 4 1 Level 5	0 Not important 0 A little bit 0 Somewhat 4 Very much
3 3	Job opportunities and contraints	0 Not at all 0 A little bit 4 Somewhat 0 Very much	0 Level 2 1 Level 3 2 Level 4 1 Level 5	0 Not important 0 A little bit 2 Somewhat 2 Very much
4	Available Job opportunities once graduated	0 Not at all 1 A little bit 0 Somewhat 3 Very much	1 Level 2 0 Level 3 2 Level 4 1 Level 5	0 Not important 0 A little bit 1 Somewhat 3 Very much
5	Social and moral role of the industry area	0 Not at all 0 A little bit 3 Somewhat 1 Very much	0 Level 2 1 Level 3 2 Level 4 1 Level 5	0 Not important 0 A little bit 1 Somewhat 3 Very much

Skills

EUROPEAN COMPETENCE ON THE SENSE OF INITIATIVE AND ENTREPRENEURSHIP		Improvement in the two months' experience	Perceived level according to the European Qualification Framework	Importance attributed for ones' professional growth
Skills				
1	Project Work	0 Not at all 1 A little bit 1 Somewhat 2 Very much	0 Level 1 0 Level 2 1 Level 3 3 Level 4	0 Not important 0 A little bit 1 Somewhat 3 Very much
2	Planning	0 Not at all 0 A little bit 2 Somewhat 2 Very much	0 Level 1 3 Level 2 1 Level 3 0 Level 4	0 Not important 0 A little bit 1 Somewhat 3 Very much
3	Problem solving	0 Not at all	0 Level 1	0 Not important

		1 A little bit 2 Somewhat 0 Very much	2 Level 2 1 Level 3 0 Level 4	0 A little bit 2 Somewhat 1 Very much
4	Communicate my ideas	0 Not at all 0 A little bit 2 Somewhat 2 Very much	0 Level 2 1 Level 3 2 Level 4 1 Level 5	0 Not important 0 A little bit 0 Somewhat 4 Very much
5	Negotiate a solution	0 Not at all 2 A little bit 1 Somewhat 0 Very much	1 Level 2 1 Level 3 0 Level 4 1 Level 5	0 Not important 0 A little bit 2 Somewhat 1 Very much
6	Teamwork	0 Not at all 0 A little bit 0 Somewhat 3 Very much	0 Level 2 1 Level 3 2 Level 4 0 Level 5	0 Not important 0 A little bit 0 Somewhat 3 Very much
7	Self-organize school and work activities	0 Not at all 0 A little bit 0 Somewhat 3 Very much	0 Level 1 0 Level 2 0 Level 3 4 Level 4	0 Not important 0 A little bit 0 Somewhat 4 Very much

Habits

EUROPEAN COMPETENCE ON THE SENSE OF INITIATIVE AND ENTREPRENEURSHIP		Improvement in the two months' experience	Perceived level	Importance attributed for ones' professional growth
Habits				
1	Self confidence	0 Less than Before 1 Like before 2 A little bit more 1 Much more	0 Non Existent 0 week 3 Good 1 Excellent	0 Not important 0 A little bit 0 Somewhat 4 Very much
2	Creativity	0 Less than Before 1 Like before 0 A little bit more 3 Much more	0 Non Existent 1 week 2 Good 1 Excellent	0 Not important 1 A little bit 0 Somewhat 3 Very much
3	Take the initiative	0 Less than Before 0 Like before 1 A little bit more 3 Much more	0 Non Existent 0 week 0 Good 4 Excellent	0 Not important 0 A little bit 0 Somewhat 4 Very much
4	Risk taking	0 Less than Before 1 Like before 3 A little bit more 0 Much more	0 Non Existent 0 week 2 Good 1 Excellent	0 Not important 0 A little bit 2 Somewhat 1 Very much
5	Perseverance	0 Less than Before 2 Like before 2 A little bit more 0 Much more	0 Non Existent 0 week 4 Good 0 Excellent	0 Not important 1 A little bit 2 Somewhat 1 Very much
6	Resourcefulness	0 Less than Before 1 Like before 3 A little bit more 0 Much more	0 Non Existent 1 week 2 Good 1 Excellent	0 Not important 0 A little bit 2 Somewhat 2 Very much
7	Self-management	0 Less than Before	0 Non Existent	0 Not important

		0 Like before 0 A little bit more 4 Much more	0 week 2 Good 2 Excellent	0 A little bit 1 Somewhat 3 Very much
88	Judge my own strengths and weaknesses	0 Less than Before 2 Like before 2 A little bit more 0 Much more	0 Non Existent 1 week 2 Good 1 Excellent	0 Not important 1 A little bit 0 Somewhat 3 Very much

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Ciclo: XXV

Titolo della Tesi: Entrepreneurship teaching in vocational education

A comparative study in Italy and Australia using the Change Laboratory

Parole Chiave: Entrepreneurship education, European key competence of the sense of initiative and entrepreneurship, vocational education, capabilities approach, Change Laboratory.

Abstract

This comparative study between Italy and Australia seeks to find the elements triggering entrepreneurial behaviour in vocational students. In both contexts, students attended class lessons and long periods of work experience. Together with their teachers and work tutor, the students involved in the project took part in weekly Change Laboratory workshops. With the help of mirror materials (interviews, documents, videos of work activity) and the researcher, during the workshops students discussed issues they had at school, work, or at the boundary between the two organizations, and found shared solutions to put into practice. Results suggest that the student's European key competence of the sense of initiative and entrepreneurship has been improved by combination of school lessons, work placement and Change Laboratory workshops. During workshops students gained a reflexive attitude on how to put into practice the sense of initiative and entrepreneurship in the workplace, thus improving their employability skills and their overall learning experience. Students also enhanced their ability to exercise judgement and make choices.

Questo studio comparativo tra Italia ed Australia cerca di trovare quegli elementi che promouvono comportamenti imprenditoriali in studenti che frequentano istituti tecnici e professionali. In entrambi i contesti, gli studenti hanno preso parte a lezioni in classe e a periodi estesi di stage in azienda; insieme ai loro insegnanti ed ai tutor lavorativi hanno partecipato a sessioni settimanali di Change Laboratory. Attraverso l'aiuto di materiali specchio quali interviste, documenti, video dell'attività lavorativa e la presenza del ricercatore, durante i laboratori gli studenti hanno discusso di problemi che avevano a scuola, a lavoro, o al confine tra le due organizzazioni, trovando soluzione condivise che sono poi state messe in pratica. I risultati ottenuti suggeriscono che la competenza europea relativa al senso di iniziativa e di imprenditorialità sia stata aumentata come combinazione di lezioni, stage e Change Laboratory. Durante i laboratori gli studenti hanno acquisito un'attitudine riflessiva su come mettere in pratica il senso di iniziativa e di imprenditorialità sul posto di lavoro, aumentando così le loro abilità connesse all'occupabilità come pure la complessiva esperienza d'apprendimento. Gli studenti sono avanzati anche nella loro capacità di esercitare giudizio e operare scelte.

Firma dello studente