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How do Italian vocational teachers educate for a sense of initiative and entrepreneurship?

Development and initial application of the SIE questionnaire

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Abstract

Purpose – The purpose of this paper is to examine how educators can teach the key competence of a sense of initiative and entrepreneurship (SIE) as a cross-curricular subject in compulsory education. It draws both on the literature relating to entrepreneurial education and on competence-based education to set out five features of entrepreneurial teaching. For illustrative purposes, these five characteristics are explored in a questionnaire put to a small group of teaching staff.

Design/methodology/approach – This study employs a qualitative approach, seeking to understand the personal perspectives of participants, and drawing out the complexities of their behaviour, whilst also providing a holistic interpretation of such behaviour.

Findings – The literature review identifies five features of entrepreneurial teaching: embedding learning outcomes for a SIE within taught subjects; active entrepreneurial teaching; educating for entrepreneurial attitudes; networking activities; being entrepreneurial as part of lifelong learning. It can be hypothesised that teaching staff teach different aspects of the SIE depending on the subject they teach (vocational or more traditional) and their role (teacher or workshop assistant).

Originality/value – Development of the SIE and the five characteristics of entrepreneurial teaching is a first step towards understanding how secondary vocational teachers and workshop assistants understand and teach the SIE as cross-curricular subject. In line with Fayolle and Gailly who called for deeper investigation of the most effective combinations of objectives, content and teaching methods, the paper seeks to establish a relationship between teaching methods, development of entrepreneurial attitudes and assessment.

Keywords Italy, Teaching, Lifelong learning, Enterprise education, Key competence, Sense of initiative and entrepreneurship

Paper type Research paper

Introduction

In recent years, there has been growing interest in how to educate for “a set of behaviours, attributes and skills that allow individuals and groups to create change, and cope with, and even enjoy, higher levels of uncertainty and complexity in all aspects of their life” (Gibb, 2005, p. 45). The question educators, policy makers and researchers have been considering is how to embed entrepreneurship teaching at all levels of education (Lackeus, 2015).

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However, most studies of entrepreneurship education have focused on higher education (Ruskovaara and Pihkala, 2013; Hietanen and Järvi, 2015), and research into entrepreneurial education in compulsory education is underdeveloped in terms both of literature and of the agencies governing and supporting secondary education (Draycott *et al.*, 2011; Johansen and Schanke, 2013; Penaluna and Penaluna, 2015).

In compulsory education, teachers play a leading role in understanding what it means to be entrepreneurial in the school context, and in transforming this understanding into teaching practices that will make students entrepreneurial in the long term (Fiet, 2001a; Deakins *et al.*, 2005; Gibb, 2008; Ruskovaara and Pihkala, 2013; Ruskovaara and Pihkala, 2015; Sagar, 2015; Seikkula-Leino *et al.*, 2015). However, entrepreneurial education research has tended to be focused on learning outcomes, with little attention being paid to teachers' perspectives (Fayolle, 2008; Jones and Iredale, 2010; Peltonen, 2015). Many teachers are not familiar with the concept (Ruskovaara and Pihkala, 2015; Ruskovaara *et al.*, 2016), or find it difficult to identify best practice and embed entrepreneurial education into their programs (Fiet, 2001a, b; Solomon, 2007; Seikkula-Leino *et al.*, 2015).

There is a need both for better exploration of how educators interpret entrepreneurial education (Hoare and Ruskovaara, 2015; Peltonen, 2015), and for tools that support teachers to develop their entrepreneurial teaching skills (Ruskovaara and Pihkala, 2013). A range of scholars have drawn both on the educational sciences and on entrepreneurship to propose conceptual frameworks for entrepreneurial education (Fiet, 2001b; Béchar and Grégoire, 2005; Solomon, 2007; Lackeus *et al.*, 2016; Macht and Ball, 2016); however, pedagogical practices are very often dictated by experience rather than by systematic approaches (Fayolle and Gailly, 2008; Fayolle, 2013).

This paper seeks to fill the research gap, and examines how educators can teach the key competence of a sense of initiative and entrepreneurship (SIE) as cross-curricular subject in compulsory education. It draws on the literature of entrepreneurial education and on competence-based education (CBE) to put forward five features of the entrepreneurial teacher. For illustrative purposes, these five characteristics are explored in a questionnaire and put to a small group of teaching staff.

Since the terms entrepreneurial, entrepreneurship and enterprise are often used without being clearly defined, the literature review undertaken for this paper starts by clarifying these terms and suggesting that they can be seen as a progression model, with enterprise education as an entry-level subject aimed at embedding entrepreneurial education in compulsory education. In Europe, the SIE is considered to be a key competence, and this paper therefore reviews CBE and the key competences for lifelong learning. The literature review then looks at five key areas for entrepreneurial education, namely active entrepreneurial teaching, educating for entrepreneurial attitudes, assessment, networking activities and professional development. The paper then sets out the five characteristics of the entrepreneurial teacher and explores them by means of a questionnaire completed by staff at a secondary technical institute located in Northern Italy. The results of the questionnaire are analysed on the basis of interpretative models of competence. In line with Fayolle and Gailly (2008), who called for deeper investigation of the combinations of objectives, content and teaching methods most appropriate for different audiences in entrepreneurial education, the conclusions attempt to set out a relationship between teaching methods, development of entrepreneurial attitudes and assessment.

Literature review

A progression model in entrepreneurial education

The literature evidences different interpretations of the term entrepreneurship (Mwasalwiba, 2010; Lackeus, 2015) depending on culture and learner age/stage of advancement (Hytti, 2008). Any discussion of entrepreneurship in education, therefore, has

to start by clarifying its terms. The two terms in most frequent use are entrepreneurship and enterprise education (Lackeus, 2015). Entrepreneurship education deals with the specific context of starting up a venture and becoming self-employed (QAA, 2012). Enterprise education, which is the most prevalent in the UK (Lackeus, 2015), aims to develop learners' ability to generate ideas and provide them with the skills to put them into practice (QAA, 2012). Its focuses primarily on personal mindset, efficacy, and the personal capabilities young people will need in future (Draycott and Rae, 2011). Lackeus (2015) proposed the use of "entrepreneurial learning" as a general term encompassing both entrepreneurship and enterprise. In line with the research and literature presented above, this paper uses entrepreneurial education as an overarching term incorporating all the others, entrepreneurship education when referring to business creation and enterprise education to designate a broader educational view of entrepreneurship.

The stage at which learners should be educated in entrepreneurship is increasingly clear in theoretical terms, but much remain to be done in practice (Lackeus, 2015). The theory indicates that students should be introduced to entrepreneurial education at an early age, by embedding teaching aimed at making learners more generally entrepreneurial across a variety of subjects and across all year groups (Fayolle and Gailly, 2008; Hytti, 2008; Jones and Iredale, 2010; McLarty *et al.*, 2010; Draycott and Rae, 2011; Hietanen and Järvi, 2015). This could later be complemented at tertiary level with specific courses on entrepreneurship, aimed at helping learners start a business. This is a basic progression model, and one which could overcome the issue of diverse definitions of entrepreneurship, different learning outcomes and disparate teaching methods in entrepreneurial education (Gibb, 2008; Hytti, 2008; Blenker *et al.*, 2011; Rasmussen and Nybye, 2013). Another reason for advocating a progression model is that while an emphasis on profits and employability has been used in higher education to justify the introduction of entrepreneurial education, such emphasis risks being counterproductive among teachers and students in compulsory education (Sagar, 2015).

CBE

The Bologna Process in 1999 set the shift from knowledge to competencies (Koenen *et al.*, 2015) and to outcomes-based approaches (Biggs and Tang, 2011). The advent of CBE is linked with a move towards knowledge-based education and a constructivist conception of learning (Mulder, 2012), whereby the learner is considered an active partner who constructs and oversees his or her own learning (Biggs and Tang, 2011). The concept of competence has been introduced in higher and vocational education to link the classroom more effectively with the workplace: instead of mere accumulation of knowledge, students are asked to understand the content of education and training, and apply such knowledge in practice (Koenen *et al.*, 2015; Mulder, 2012). Competence is generally understood to be a holistic combination of knowledge, skills and attitudes used as appropriate to solve problems in a given context (Baartman *et al.*, 2007; European Commission, 2007; Mulder, 2012). In CBE, the role of the teacher is more complex than in traditional education, because besides being a source of information, s/he acts as coach and facilitator, and designs learning tasks that are closely related to workplace situations (Koenen *et al.*, 2015; Mulder, 2012). To help teachers put CBE into practice, a group of Dutch researchers (Wesselink *et al.*, 2007) developed a framework for CBE, setting out eight design principles that were later validated by a Delphi study undertaken by Sturing *et al.* (2011).

The European Framework for key competences represents the political agreement on what a learner should be able to know and do at the end of their compulsory education (van Woensel, 2008). The aim of the Framework is to identify and define a set of key competences for lifelong learning that will help learners with active citizenship, personal fulfilment, employability and social cohesion in a knowledge society (European Commission, 2007). The seventh key competence is a SIE, which is defined as the ability

to turn ideas into actions (European Commission, 2007). This definition is strikingly similar to the definition of enterprise education given by the QAA. Since both definitions take a broad educational view of entrepreneurship, this paper considers enterprise education and educating for a SIE as being synonymous with embedding entrepreneurial education in compulsory education.

Entrepreneurial education

Similarly to CBE, entrepreneurial education research no longer considers static knowledge appropriate for helping learners to thrive in continuously changing societies (Penaluna and Penaluna, 2015). Lackeus (2015) found that entrepreneurial research commonly sets entrepreneurial education in opposition to traditional education. While the former is considered to be individualised, process- and project-based, cooperative, experiential and multidisciplinary, the latter is seen as standardised, content-focused, passive and based on subject silos. Entrepreneurial education challenges traditional teaching practices, which are geared towards paid employment, and aim to indoctrinate students to obey and to reproduce facts (Sagar, 2015); it improves students' motivation to learn, engagement and fosters deep learning (Lackeus, 2015; Sagar, 2015). The creative and innovative teaching methods of student-centred learning are therefore what entrepreneurial education requires (Gibb, 2005; Balan and Metcalfe, 2012; Bell, 2015; Peltonen, 2015; Penaluna and Penaluna, 2015). However, innovative teaching methods alone are not enough to promote effective learning: the theory of constructive alignment advocates coherence between learning outcomes, teaching and learning activities, and assessment (Biggs and Tang, 2011). The same coherence is acknowledged to be a feature of course design both in competence-based approaches (see Baartman *et al.*, 2007) and in entrepreneurial education (see Lackeus, 2015; Penaluna and Penaluna, 2015). In Macht and Ball (2016) analysis, the constructivist concept of student-centred learning identifies Biggs' theory of constructive alignment as a quasi-meta framework for entrepreneurial education.

Although there is little research on the entrepreneurial education practices of teachers in compulsory education (Seikkula-Leino *et al.*, 2015), one exception is the Measurement Tool for Entrepreneurship Education (MTEE), developed in the Finnish context between 2008 and 2012 by Ruskovaara *et al.* This online survey consists of 140 questions and has been cross-tested by teachers; it covers seven areas ranging from course design to use of activities to pedagogical solutions to networking activities.

The following section reports the results of a literature review looking at five key issues for an embedded approach to teaching a SIE in schools. The issues are: entrepreneurial teaching, educating for entrepreneurial attitudes, assessment, networking activities and professional development. These desirable characteristics of entrepreneurial teaching were identified by means of analysis of the literature and discussions with teachers and experts in the fields of entrepreneurial education and educational research.

Teaching methods

A wide range of teaching methods have been associated with entrepreneurial education (Fayolle, 2008; Fiet, 2001a; Solomon, 2007). While Fiet (2001a) suggests that teachers should use a variety of teaching methods, for Fayolle and Gailly (2008) these should be selected on the basis of their previous effectiveness in delivering objectives, the nature of the audience, content and any limitations arising from the institutional environment. There is broad agreement that experiential learning or learning by doing, focused on practical activities and projects that interact with the outside world, helps learners develop entrepreneurial skills and attitudes (McLarty *et al.*, 2010; Wang and Chugh, 2014; Lackeus, 2015; Peltonen, 2015; Penaluna and Penaluna, 2015).

Other pedagogical approaches appropriate for entrepreneurial education are problem-based learning, project-based learning, service-learning and social team-based learning (Lackeus, 2015).

Teaching methods focusing on team work are important since research has shown that most new ventures are created by teams (Klotz *et al.*, 2014). The learning environment should encourage self-discovery (Mwasalwiba, 2010), positive mistake learning (Jones and Iredale, 2010) and learning from failing (Cope, 2011).

For King (1993), the teacher should be a “guide on the side” rather than a “sage on the stage”, permitting students to think and act independently. Mentoring plays a key role (Jones and Iredale, 2010; McLarty *et al.*, 2010) because it helps learners to develop entrepreneurial attitudes such as self-confidence and self-efficacy (Jones and Iredale, 2010). Hytti and O’Gorman (2004) found that a condition of a successful course was for the trainer to avoid authoritative instructions, instead acting as coach, asking questions to help students identify critical issues, and when providing advice, leaving to students the final decision on how to move ahead.

Entrepreneurial attitudes

The literature evidences specific attitudes that represent the building blocks of an entrepreneurial mindset. For Gibb (2005), the entrepreneurial teacher encourages calculated risk-taking, innovative approaches to the identification of opportunities and the acceptance of responsibility. Lackeus (2015) suggests that an embedded approach to entrepreneurial education should aim to develop attitudes such as creativity, self-efficacy and engagement but should also include some uncertainty and ambiguity which can be hard for learners to cope with, at least initially. Bell (2015) highlights proactivity, risk-taking and self-efficacy, while van Gelderen (2012) proposes autonomy and personal initiative as basic entrepreneurial attitudes that should be fostered in compulsory education.

More interestingly, the literature refers to entrepreneurial attitudes that can be developed through specific teaching methods and assessment practices. A first example is risk-taking. For Penaluna and Penaluna (2015), students should be “reasonable adventurers” able to think and act based on decision-making processes. Teaching methods foster risk-taking, allowing positive mistake-making, where students feel comfortable making mistakes and are able to learn quickly from them (Jones and Iredale, 2010). The aim is to develop individuals who are able to act confidently in risky and/or ambiguous situations (Penaluna and Penaluna, 2015).

A second example of entrepreneurial attitudes that are linked to specific teaching methods and assessment practices is creativity, which is achieved through learning environments that put the learner in the driver’s seat (Penaluna and Penaluna, 2015) and through an understanding of the involvement of emotions in learning (Cope, 2011). By focusing on the process, good teaching always allows for unintended but desirable learning outcomes, thus leaving space for learners’ creativity (Biggs and Tang, 2011).

A third example is autonomy and responsibility. Autonomy “affords organisational members the freedom and flexibility to develop and enact entrepreneurial opportunities. [...] The independent spirit and freedom of action necessary to advance new venture development is a driving force of entrepreneurial initiatives” (Lumpkin *et al.*, 2009, p. 47). For Mueller and Anderson (2014), responsibility is a key attitude: it initially helps learners engage in the learning process, and later promotes an entrepreneurial way of living. Self-direction improves motivation and can be utilised to demonstrate self-reliance and the ability to spot learning opportunities (Penaluna and Penaluna, 2015). To teach this attitude, it is important to connect with students’ current level of autonomous learning, and then progressively to transfer to them the responsibility for the entire learning process (Mueller and Anderson, 2014). The authors suggest that a low-risk environment encourages learning from failure, so that taking on responsibility is seen as being rewarded by personal growth and learning rather than being connected with fears and anxiety.

However, student-led approaches and assessment practices are key if the entrepreneurial attitudes set out above are to be embedded in schools.

Assessment practices

Educational research suggests that assessment plays a fundamental role and that assessment is the best stimulus for learning: for students, it is the curriculum that is assessed (Baartman *et al.*, 2007; Biggs and Tang, 2011). Unfortunately, assessment practices in education have tended to favour straightforward, easy measurement of positivistic outcomes, which appears to run counter to the teaching of an entrepreneurial mindset (Lackeus, 2015; Penaluna and Penaluna, 2015). The position paper of Birenbaum *et al.* (2006) criticised assessment practices across Europe on the basis that they do not meet the demands posed by a knowledge economy and society, the issue being that assessment practices concentrate on summative assessment (“of” learning) rather than on formative assessment (“for” learning).

Although there is very little research dealing with assessment in entrepreneurial education (Pittaway and Edwards, 2012), it is increasingly clear that learner-led approaches are required. For Sagar (2015), students should co-design, co-teach and co-assess entrepreneurial education activities through formative and peer assessment. For Draycott *et al.* (2011), entrepreneurial education is characterised by radical forms of assessment going beyond assessment “of” learning and “for” learning. In assessment “as” learning the learners choose the goals they want to achieve and self-assess the extent to which they have met those goals (Draycott *et al.*, 2011). Some authors (Jones *et al.*, 2014; Penaluna and Penaluna, 2015) suggest a progression model for assessment: from pedagogy, which is teacher-centred, to student-centred andragogy, where there is a degree of self-determination on the part of the learner, to student-led heutagogy, where the student is considered to be a self-determined, motivated and autonomous learner who seek guidance and negotiates access to learning resources.

It is also important that students know whether they will be assessed for implementation or for innovation (Penaluna and Penaluna, 2015). In learning for implementation, students are measured by “known knowns” (p. 22), i.e., through learning outcomes that strictly predict performance. In contrast, in learning for innovation, learning outcomes acknowledge the need for assessment to be driven by process, for instance the capacity to find multiple solutions or generate alternative ideas. Biggs’ theory of constructive alignment is particularly important for designing “fit for purpose” assessment practices (Penaluna and Penaluna, 2015). For Biggs and Tang (2011), open-ended assessment tasks are key to promoting unintended learning outcomes.

Networking activities

Schools often overlook the importance for capacity building of sharing knowledge across boundaries, a process which would build experience and enhance skills (Penaluna and Penaluna, 2015). Moreover, there are often stakeholders who would be happy to support students’ development and whose contribution would be essential for implementing entrepreneurial education inside schools (Pittaway and Hannon, 2008; Penaluna and Penaluna, 2015). It is activities outside school that are the critical success factors for entrepreneurial education (Draycott and Rae, 2011; Hietanen and Järvi, 2015; Jones and Iredale, 2010; Lackeus, 2015), for instance cooperation with companies, associations, national and international initiatives (McLarty *et al.*, 2010; Ruskovaara and Pihkala, 2015). Kuratko (2005) argues in favour of dialogue between different stakeholders, using entrepreneurs as role models, and entrepreneurs’ involvement in classroom activities. In-school networking is another fruitful approach, and can be achieved by engaging in interdisciplinary projects with colleagues (Jones *et al.*, 2014; Sagar, 2015).

Professional development

Previous research (Hytti and O’Gorman, 2004; Bécharde and Grégoire, 2005; Solomon, 2007; Ruskovaara and Pihkala, 2013) suggests that entrepreneurial teaching consists in the

readiness of teachers to stimulate, maintain and lead students' entrepreneurial learning processes. These studies indicate that in order to do this, teaching staff have to become entrepreneurial themselves (Peltonen, 2015). For Gibb (2005) too, teachers should be more entrepreneurial in their practices and ethos, thus acting as entrepreneurial models for their students (Penaluna and Penaluna, 2015). Mueller and Anderson (2014) argue that educators should display entrepreneurial maturity by designing a learning environment that provides space for growth and learning.

Hytti and O'Gorman (2004) suggest that training the trainers is crucial to developing effective programs in enterprise education. In empirical research carried out by Ruskovaara and Pihkala (2013), teacher training was found to be key to explaining teachers' entrepreneurial education practices in compulsory education. Peltonen (2015) concluded that, seen from teachers' point of view, entrepreneurial education is also a matter professional development and pedagogical renewal, meaning that teachers should be considered entrepreneurial agents rather than mere executors of policy recommendations. A Nordic research stream on pedagogical entrepreneurship focuses on teachers' entrepreneurial competences as an integral part of their professional competence (Peltonen, 2015). For Leffler (2002), pedagogical entrepreneurship means that a teacher can be considered an entrepreneur developing students' entrepreneurial competences by means of educational activities. Pedagogical entrepreneurship is an outlook on life and work that relies on teachers having a positive attitude towards entrepreneurship (Peltonen, 2015). The use of this term could therefore support teachers in going beyond a purely economic view of entrepreneurship.

The implementation of entrepreneurial education in schools also depends on the institutional context and the management of the school in question (Peltonen, 2015; Penaluna and Penaluna, 2015; Ruskovaara *et al.*, 2016; Sagar, 2015). In the entrepreneurial school, both the hidden and the formal curriculum align to teach a "can do" attitude (Hoare and Ruskovaara, 2015). However, schools' learning culture often seems to run counter to entrepreneurial education (Deakins *et al.*, 2005; Gibb, 2005; Hytti and O'Gorman, 2004; Mueller and Anderson, 2014).

Development of the SIE questionnaire

The development of the SIE questionnaire arises from the need to measure and better understand the way teachers educate for the European key competence of a SIE. Entrepreneurial education to develop this key competence is seen as part of a lifelong learning process that encompasses cross-curricular skills (European Commission *et al.*, 2016), and that requires enterprise education to be embedded in compulsory education. Such an instrument has to have a basis in theory, and to have regard to the literature both on entrepreneurial education and on CBE. In line with the literature review conducted above, five features of cross-curricular teaching for a SIE have been incorporated into the SIE questionnaire:

- (1) The first feature is embedding the learning outcomes and student-centred assessment practices for a SIE within taught subjects. Learning outcomes need to be delivered horizontally, across the curriculum, vertically, across school levels, to ensure progression through all levels of compulsory education (European Commission *et al.*, 2016). Learning outcomes should be a balanced mix of knowledge, skills and attitudes, and should not be so fragmented as to lose the holistic nature of the key competence (Pepper, 2011). Teachers should consider a mixture of forms of assessment: "of" learning, "for" learning, and "as" learning. Assessment should move progressively from pedagogy to andragogy and to heutagogy, with students selecting the goals they want to achieve and self-assessing the extent to which they have been met.

- (2) The second feature of cross-curricular teaching for a SIE is focus on active teaching, for example experiential learning, group work, project work, problem solving and mentoring. These can be combined or varied according to the subject taught.
- (3) The third feature is educating for entrepreneurial attitudes. Active teaching should aim to foster an entrepreneurial mindset as appropriate to the individual, including creativity, risk-taking, autonomy and responsibility.
- (4) The fourth feature of cross-curricular teaching for a SIE is networking activities between school and places of work. Partnerships can be initiated within schools, i.e. with other colleagues, subjects and courses, and with organisations outside school, to engage students in meaningful activities and avoid the “encapsulation” of knowledge acquired at school. In vocational subjects, teachers having a working relationship with the industry connected to their subject is regarded in a positive light: this ensures that the teacher’s competencies are current and that he or she is aware of industry requirements, which, in turn, means s/he can plan activities for students that go beyond the boundaries of school, course and subject.
- (5) The fifth feature is seeing entrepreneurialism as part of lifelong learning, namely inside and outside the school context and throughout professional development. The entrepreneurial teacher participates in specific courses on entrepreneurship but also develops his or her own SIE more broadly, for example by coming up with new ideas for stimulating creativity, risk-taking, autonomy and responsibility. Discussion of pedagogical entrepreneurship with other teaching staff and colleagues is another good indicator of the importance accorded to the topic in the school.

The SIE questionnaire differs in many aspects from the MTEE. First, the MTEE is an online tool, while the SIE is a paper and pencil questionnaire, which can also be administered in the form of an interview. Second, while the MTEE has statements with multiple-choice responses, the SIE takes an interpretative approach. For each question, in addition to multiple-choice answers relating to the frequency of the behaviour in question, it provides space for comments. It follows that while MTEE has the advantage of covering a large number of respondents, the SIE can provide deeper and more contextualised data on the way the teachers teach a SIE and incorporate it into their daily practice. Third, the MTEE has statements covering “for”, “about”, and “through” approaches to entrepreneurial education (Seikkula-Leino *et al.*, 2015). By way of contrast, the SIE questionnaire concentrates on an “embedded” approach to entrepreneurial education, in line with the cross-curricular nature of the key competence for lifelong learning.

Methodology

Within a bigger research programme lasting six months in 2016 and including participant observation and a formative intervention, the five features described above were adapted to an upper secondary technical school context, and developed into the 24 questions in the SIE questionnaire. The questions are shown as follows:

- (1) Entrepreneurial learning outcomes, and “as” and “for” assessment forms:
 - Developing a SIE is a goal of my curriculum.
 - I have evaluated my students’ SIE.
 - I have developed evaluations where students had to choose their objectives or self-evaluate.
- (2) Active entrepreneurial teaching:
 - What percentage of your teaching do you generally deliver through lectures?

- I have facilitated practical experience through learning by doing.
- I have organised group work-based activities for my classes (e.g. cooperative learning).
- I have organised project work-based activities for my classes.
- I have used problem solving in my teaching.
- I have utilised mentoring (e.g. by going to students' seats and giving them advice on their work).
- I have held informal discussions in class to transform it into a place of debate.

(3) Educating for entrepreneurial attitudes:

- I have taught my students how to deal with the risks entailed by being enterprising, and helped them learn how to accept failure.
- I have supported my students when they have shown initiative, for example by accepting their proposals.
- I have prepared activities where students could express creativity and be innovative.
- I have encouraged my students to take responsibility and to be autonomous.

(4) Networking activities:

- I have established partnerships with industry/the outside world.
- I have involved experts in my classes.
- I have organised school visits to places of interest.
- I have organised multidisciplinary projects with my colleagues.
- I work for local industry outside school.

(5) Being entrepreneurial as part of lifelong learning, professional development:

- I have taken part in projects and/or courses to stimulate my own SIE.
- I have discussed entrepreneurship education with colleagues and experts.
- During my school life (in the classroom and in the school) I show my SIE.
- In my life outside school I show my SIE.

The questions were tailored to the cultural context of a technical institute located in small city in the Lombardy region in Northern Italy. They were put together in the form of questionnaire given to the entire staff of 21 teachers and workshop assistants of grades III, IV and V of a technical institute specializing in surveying and logistics. The aim was to establish a base line to decide the areas to be targeted in the subsequent formative intervention. Of the 21 participants, who all participated later in the formative intervention (this was the selection criterion), ten were technical teachers (teachers of vocational subject), seven workshop assistants, and four general education subject teachers (maths, literature and foreign language). The questionnaire was tested and optimised in a preliminary study, with the questions being reviewed by two colleagues of the researcher who specialised in qualitative research, and piloted with three teachers who did not belong to the group, in order to verify its intelligibility. A literature teacher revised the questionnaire to make sure it was well written.

The questionnaire session lasted 30 minutes. To ensure validity (Ravitch and Carl, 2015), it included a general introduction to/definitions of key competences, the SIE, and entrepreneurial education. These were read to the participants. The questionnaire also had notes with definitions of key educational terminology such as learning by doing, problem-based learning, mentoring, and critical thinking. Although such terms are often mentioned in everyday teaching contexts, it is sometimes difficult for teachers to recall them. For each question, respondents rated the frequency of their deployment of the practice in question (never, sometimes, often, always when possible) over the last six months, and gave concrete, detailed and precise examples from their everyday practice. The questions focused on experience and behaviour in order to ensure ecological validity – that is, the respondents' behaviour in a real-world setting (Ravitch and Carl, 2015).

An interpretative approach was taken to data analysis. This approach has already been used by Peltonen (2015) in her study of teachers' entrepreneurial competence. Interpretative approaches capitalise on phenomenology, with the worker and the job forming a single entity through the meaning acquired by work in a worker's experience (Sandberg, 2000). Competence is still conceived of as set of attributes, but these are situational and dependant on the context: "when practice becomes the locus, competence is seen as an indistinguishable part of professional practice and assumed to be relational" (Sandberg and Pinnington, 2009, p. 1141). A feature of this approach is that competence is manifested in practice and based on tacit knowledge (Sandberg, 2000). Furthermore, "professional competence is not primarily constituted by knowledge and skills but by the professionals' understanding of their work" (Sandberg and Pinnington, 2009, p. 1142): the ability to learn from experience, to reflect and learn independently is essential. The basis for competence development is participants' appreciation and understanding of the task (Peltonen, 2015).

The validity of this study, defined as coherence between the interpretation of the researcher and the material investigated (Sandberg and Pinnington, 2009; Ravitch and Carl, 2015), was ensured by: holding a range of meetings with, and giving presentations to, participants to ensure they understood the purpose of the research; conducting field research in the school for six months, including participant observation and workshops with the teaching staff; familiarity with the history and background of the institution, having conducted a range of research in that school over a period of four years; sharing questionnaire results with respondents during the formative intervention stage; and discussing and analysing the data with two scholars specialising in qualitative research methods and entrepreneurship education, and presenting the findings to conferences in entrepreneurship education.

Results

Respondents were asked to indicate the frequency of their engagement with the categories of activity described and these are shown along with examples of comments made by participants, translated into English. The provision of short quotations is intended to illustrate the different ways, different participants discuss the same topic (Ravitch and Carl, 2015).

Table I shows the SIE questionnaire, with the questions, and participants' results for the individual sub-questions.

The respondents were happy to answer the questions and share their practices. Two thirds of the teachers had at least 20 years' experience, with five being close to retirement. None of the respondents had initial teacher training before they started to teach. The workshop assistants were all under 35 years old, and most had only a high school certificate, their task being to assist technical teachers. They worked both in the workshops and in the classroom.

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Area	Question	Average (<i>n</i> = 21)	Technical teachers (<i>n</i> = 10)	Workshop assistants (<i>n</i> = 7)	Humanities and sciences (<i>n</i> = 4)
Entrepreneurship learning outcomes and assessment practices	Goal of the curriculum	1	1	1	1
	Evaluation of key comp	1	1	1	1
	Evaluation “for” and “as”	1	1	1	2
Entrepreneurial teaching methods	Lecture	50%	60%	40%	50%
	Learning by doing	2	2	4	2.5
	Group work	2	2	2	3
	Project work	2	2	3	1.5
	Problem solving	3	3	2	2.5
	Mentoring	3	2.5	4	3
	Negotiation – debate	2	2	2	2.5
	Risk management	1	1.5	1	1.5
	Initiative	2	2	2	3.5
	Creativity and innovation	2	2	2	2
Entrepreneurial attitudes	Responsibility and autonomy	3	3	3	3
	Partnerships with industry	2	2	1	1.5
	Involvement of experts	1	1	1	1
	Company visits	2	2	2	1.5
	Multidisciplinary projects	1	1	2	1.5
Networking activities	Second job in industry	Yes	Yes	No	No
	Entrepreneurial courses and initiatives	2	1.5	1	2.5
	Discussions with colleagues	1	1	1	1.5
	Entrepreneurial in school	3	2	3	2.5
	Entrepreneurial in life	3	3	3	2
Being entrepreneurial as part of lifelong learning		Key medians: 1 = never; 2 = sometimes; 3 = often; 4 = always			
		Note: <i>n</i> = 21			

Table I.
SIE results*SIE in the curriculum, and assessment “as” and “for” learning*

Most respondents do not include the key competence of the SIE as a goal in their curriculum, and they do not assess it. Only humanities and general education teachers sometimes use assessment “for” and “as” learning. The qualitative analysis reveals three categories relating to the SIE and its assessment. First, for the respondents, this key competence is relevant for connecting school with working life. Asked about assessment of the SIE, a workshop assistant says “I assess the students’ projects according to how far they resemble the reality of the real-estate market”. Asked how he includes the SIE in his curriculum, a technical teacher comments “Every activity I carry out has the aim of anchoring my subject in reality”. Second, for some participants the SIE is about autonomy “When I enter the classroom, the lesson isn’t traditional, but is being given by an entrepreneur. I teach the students to be ambitious and never give up. When they come to school they must understand that they are doing something for themselves, and are exposed to risks if they do not intend to dedicate time to study” (technical teacher) and “I evaluate autonomy, and whether or not the student makes appropriate choices” (technical teacher). Lastly, personal initiative is highly appreciated by respondents, but is considered an attitude that the students either have or do not have, rather than something that can be taught: “I assess the students’ initiative and active participation, for instance, if students go beyond what I have taught them when solving a problem” (technical teacher) or “I have tried to provide my class with challenges, but they are rarely taken up” (Maths teacher).

Respondents have two interesting practices in relation to assessment “for” and “as” learning. First, during written tests, some use transparent criteria and evaluation grids

(which are supposed to be mandatory across the school for all teachers), so that students know the marks available for each exercise in advance and can therefore choose to start with an exercise they are confident with. Second, after oral examinations, some teachers ask students to rate their performance and give reasons for their rating. These practices are related to the perceived need to promote students' autonomy.

Active entrepreneurial teaching

The respondents say that only half of their time is devoted to lectures. It seems that in this group technical teachers are the ones who use lectures the most, while workshop assistants use them the least.

Learning by doing is considered one of the most important forms of learning in entrepreneurship education. For respondents, this means providing students with experiences that are as practical as possible, depending on the subject they teach. The analysis identified six categories of activity with varying locations and degrees of abstraction/concreteness: undertaking a project ("In the project maths and musical sounds make waves visible" or "farming a quarry"); giving real life problems ("A gardener has to mow grass within the area of a polygon, and I ask the students to estimate the area" or "I simulate what happens on a building site – I pretend I am the buyer"); role-playing ("In the French revolution, the student pretends he or she is a character and has to defend their interests against other students" or "Simulation of everyday speaking situations"); computer simulations ("Students use AutoCAD and Photoshop, they work, and I don't explain how to use the programs"); workshops ("Construction of an amplifier sized from a mathematical point of view" or "Students survey the class and the furniture"); and outdoor activity ("Field survey" or "Laying foundations, digging with mini excavators, building small walls").

Group work. Here, the analysis combined with field observations suggests that group work is not a teaching method the respondents feel confident with. A technical teacher comments "It risks being counterproductive" while another says they use it "only in pairs, with one student explaining to the other". A workshop assistant comments that it would only be feasible when the workshop assistant is completely occupied. Generally speaking, teachers make use of group work only during special classroom activities such as recapitulating material.

Project work. Analysis of the answers combined with participant observation reveals that specialist surveying teachers and their technical assistants are confident with this teaching method: projects relating to buildings or at least part of them, cycle tracks, and gardens. It is harder for teachers of more academic subjects to include project work. The maths teacher managed just once with a project on maths and music, while the English teacher created a project related to the parts of a warehouse as part of the logistics element of the course. A technical teacher considers project work to be a way of undertaking interdisciplinary work "We are missing out on the cross-cutting nature of the subject (surveying): economics and land valuation would be connected to law, construction technology, surveying, but every teacher follows his or her subject without interfering with other subjects".

Problem solving. Rather than referring to a specific educational method such as problem-based learning, participants considered problem solving as being the practical application of the principle explained by technical teachers: "I give the students a ceiling to design and ask them to find the right structural solution", "I represent an anonymous buyer and present a real-world problem: blueprint, gazebo, finding a house and designing the garage". A technical teacher states how hard it is for students to apply learning to solve problems: "I try to explain the process so that it can be applied to other contexts, but often they get stuck".

Mentoring. This was defined as a relationship where a more experienced person helps a less experienced person. This definition seems to apply to work environments. A maths teacher says it is used “only during catch up or group work activities, as I generally have to deal with the whole class”. For respondents, mentoring is considered to support other teaching methods such as project work, “During a project I walk around to solve comprehension problems”, and lectures “After my explanation I set an exercise and walk around to provide individualised help”.

Debate. For teachers, it is normal to have unstructured discussions with students: “Discussing rules and motivation for staying at school”, and “Sometimes discussions occur spontaneously” (technical teachers). However, there are teachers who seem to understand debate more as methodology: “I set a debate on an estimate: is it subjective or objective? It’s a tremendous methodology, but it’s difficult to use as students lack the social skills to work together” (technical teacher) and “I use it with various topics, I take an article from the newspaper, it can be on electromagnetic waves, the relationship between science and faith, the sense of mystery in literature. I don’t give the answers” (literature teacher).

Entrepreneurial attitudes

The participants consider that autonomy and responsibility are the most important attitudes to foster in their students, with risk-taking being the least important.

Risk-taking. The analysis reveals three issues in relation to teaching. Some respondents teach it as awareness of an error and the learning opportunity it presents “If someone fails a test, we reflect on the causes of the errors” (literature teacher) or “First, the students work. If they have made a mistake, I want them to become aware of it, and only then do I give help” (workshop assistant). Some teachers share stories “Sometimes I talk about my activities outside the school, you always have to be careful in your work, but sometimes things go wrong” (technical teacher), whereas others directly educate for this attitude “I do it every day. Since the beginning of the year I have kept on telling the students that they are entrepreneurs and are exposed to risks according to the choices they make. It’s useless to cry after making the wrong choice. It’s important to understand that there are always consequences” (technical teacher).

Initiative. The analysis of answers, here, uncovers three themes concerning students’ initiative. First, generally speaking, students appear passive: “Over the years students have become more passive – it’s not a school problem but one that relates to society as a whole”, says a technical teacher. Second, students’ proposals are welcomed by teachers, for example ideas about the essay they should write for the state exam at Grade 5, about the programme, or suggestions for test dates. Third, having initiative is considered a synonym for excellence, a going beyond what is being asked for. A maths teacher reports “In Grade 4 there’s a smart group, it’s a stimulating class. They make requests that go beyond the curriculum”.

Creativity and innovation. It seems from the answers that it is difficult to embed these entrepreneurial habits into surveying and logistics, which are more concerned with orderliness and the best way to do things. However, a technical teacher comments: “Within design, you can always tell a good project apart from a bad one”, meaning that students can be creative and innovative in the way they design, within established constraints.

Autonomy and responsibility. This is certainly the entrepreneurial habit respondents most seek to foster in their students, and all participants answer this question. For most of them, educating for responsibility and autonomy means meeting the deadlines for homework and projects, and being prepared for examinations. A technical teacher asks students to deliver parts of lessons, while another technical teacher comments on the importance of this habit “If they are not autonomous, nobody will want them outside the school. I encourage them to take the lead in their life, and I get angry when they fail a test

and think they will never catch up. I want them to think: next time I will study and get the best mark". Only the literature teacher is critical "We all say we encourage them, but in fact that is not the case".

Networking activities

Partnerships with industry. Only a few technical teachers are in charge of networking with industry. In every class, there is a technical teacher who acts as work experience coordinator, and he or she is the one responsible for maintaining contacts with industry. The analysis of responses reveals two issues: the function of the partnership: it can be either for work experience or for school visits; the kind of industry with which contacts are sought: it can be with universities and polytechnics, the local confederation of industry, the register of surveyors, or private practitioners.

Involvement of experts in classes. It is rare for teachers to invite experts to give lectures at the school. Just once, a technical teacher invited "the local industry association representative".

Company visits. These are more common in respondents' experience, mostly in the case of technical teachers and workshop assistants, who organise visits to workplaces ("local state archive", "workshop of analysis", "rebuilding of churches after earthquakes"). However, subject teachers also organise visits to places of interest ("international trade fairs" and "cultural festivals").

Multidisciplinary projects. The most interesting finding is that it is difficult to cooperate with colleagues within school: "I encountered resistance from colleagues, they want to use up my teaching hours but not work together" (literature teacher) and "There's too much compartmentalisation in this school, the resources of my subject aren't fully exploited" (technical teacher and entrepreneur). Other technical teachers do cooperate, for example, on a project relating to drone-based surveying.

Second job in industry. Most of the specialist surveying teachers have a second job in industry as a consultant, or a private practice connected to the subject they teach. Logistics teachers also have second jobs in industry, but not connected with the topic they teach.

Being entrepreneurial as part of lifelong learning

Entrepreneurial professional training. A third of the answers were left blank. Some respondents answered the question on what type of course they had undertaken but not why it was entrepreneurial. Some took specific courses in entrepreneurship "I did a Masters with a course on entrepreneurship" (technical teacher) or entrepreneurial skills "I took a course on leadership and group work" (literature teacher). For one technical teacher, the topic is too new. For another technical teacher, it is an important matter: "That's what it's all about. I want to be stimulated and have new ideas for my job. There are courses that leave you with nothing, but I want to transform my practice innovatively" (Maths teacher) or "The courses I took to update my skills made me reflect on my field and that there's a need for new ideas on how to approach problems. There's a need to create new jobs with new services to create a market niche" (technical teacher).

Discussion with colleagues. Half the questions were left blank: "I don't remember debates about this", "now that the school has involved me" (technical teachers).

Being entrepreneurial within school. Workshop assistants seem proactive within the school: "The proposal for the quarry project was mine, as was the visit to the chemical analytical laboratory". The literature teacher is entrepreneurial in the classroom "I am weird so I invent new ways of teaching". Some technical teachers do not feel they are entrepreneurial "I just cope with day-to-day things", or "I have been hampered by the fact that I ended up teaching a subject that isn't mine". One technical teacher feels he/she is

entrepreneurial in that he/she writes grant applications “I wrote projects and obtained funding for an interactive multimedia board, students’ leasing of personal computers, and workshop equipment”.

Being entrepreneurial outside school. For technical teachers being entrepreneurial outside school means having a private practice “I have my private company”, and “I cooperate with my daughter’s private practice”. Other respondents believe it is also possible be entrepreneurial in the private sphere: “I proposed that my family visit Florence” (workshops assistant); “I organise journeys with my friends” (workshop assistant); and volunteering “I organise courses in my parish to prepare couples for marriage” (technical teacher).

Conclusions

In line with Jones and Matlay (2011) this study has considered entrepreneurial education as a contextual phenomenon characterised by a dialogical relationship between the student, the educator, the community, the institution and the educational process, with the student at its centre. While the extensive study by Ruskovaara and Pihkala (2013) found that teachers in secondary vocational education are more engaged in entrepreneurial education than those in secondary education generally, this pilot study focused on a specific vocational context. It could be hypothesised that the teaching staff teach different aspects of the SIE depending on their subject (vocational or general education) or their role (teacher or workshop assistant). For example, in the group of participants, workshop assistants make use of teaching methods such as learning by doing and mentoring, while technical teachers are more likely to use problem solving. In relation to entrepreneurial attitudes, only general education teachers teach initiative.

Previous studies (Ruskovaara and Pihkala, 2013; Seikkula-Leino *et al.*, 2015) revealed that teaching staff did undertake entrepreneurial education but were unaware of doing so. In the case of this study, although the participants teach different facets of a SIE, they seem to overlook its holistic dimension. Moreover, training in entrepreneurship was identified as a critical factor for the delivery of entrepreneurial education in compulsory education (Ruskovaara and Pihkala, 2013), and these participants did not undergo any training. Hytti and O’Gorman (2004) suggest that initial training in entrepreneurial education should cover awareness of entrepreneurship and entrepreneurs’ role in society. This helps build a positive attitude towards entrepreneurship, which is key for the entrepreneurial teacher (Peltonen, 2015). Preliminary training could therefore be a helpful way of heightening participants’ awareness of the importance of a SIE.

For Lackéus *et al.* (2016), teachers face the dilemma of navigating between the vagueness of progressive education and the rigidity of traditional education. The SIE results show participants to be anchored in teacher-centred approaches with lectures and summative assessment, which tend to turn students into passive recipients. It should be remembered, however, that entrepreneurial education in Italian compulsory education is still in its early stages. Similarly to other European countries, many Italian teachers have prejudices about entrepreneurship since they perceive it as being concerned only with profit (Baschiera and Tessaro, 2015). In 2017 the Ministry of Education for the first time financed projects on entrepreneurial education in secondary schools. The only government document on entrepreneurial education was written by ISFOL (2013), and recommends work experience as the primary activity for entrepreneurial education, thus ruling out the role that schools should have in teaching this key competence.

The development of the SIE and the five features of entrepreneurial teaching is a first step towards understanding how secondary vocational teachers and workshop assistants understand and deliver the SIE as cross-curricular subject. This paper shows that in vocational education, entrepreneurial education and CBE are compatible, sharing the aim of making the classroom relevant to the world of work by switching to student-centred

approaches (andragogy) or to student-led approaches (heutagogy). Educating for the key competence of a SIE, therefore, represents a synthesis of entrepreneurial education and CBA. Furthermore, following Fayolle and Gailly (2008), who called for deeper investigation of the best ways to combine objectives, content and teaching methods to address the needs of different groups as regards entrepreneurial education, this paper makes an initial connection between teaching methods, assessment practices and entrepreneurial attitudes. This is important for two reasons. First, as an integral component of competence, entrepreneurial attitudes are important in CBE. They are even more important for embedded approaches attempting to teach an entrepreneurial mindset in the context of other subjects. Second, compared with other forms of education based on student-centred approaches, teaching entrepreneurial attitudes is becoming the distinguishing feature of entrepreneurial education.

Limitations of this study and directions for future research

The findings of the SIE are only representative of the school in question and the group of teachers where it was undertaken, and other schools may show different results. A Delphi study could help identify more features of entrepreneurial teaching. Further study is necessary to confirm that staff teach different aspects of entrepreneurial education depending on their subject and role. In the SIE, more questions on the cultural environment and school management could help achieve better understanding of how and to what extent the environment and school management support or impede teachers' entrepreneurial activity. Other questions could usefully explore how teachers encourage reflection on entrepreneurship as part of lifelong learning. This paper opens avenues for future research on how to embed entrepreneurial attitudes into specific teaching methods and assessment practices.

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