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Evaluation of entrepreneurial competence through scaled behavioural indicators: validation of an instrument.

Wouter Schelfhout, Kristien Bruggeman, Sven De Maeyer

Abstract

In recent years, entrepreneurship has occupied a prominent position on the agendas of policymakers and researchers. This is not surprising, as studies have shown that the enhancement of the entrepreneurial spirit can make an effective contribution to sustainable economic growth. Moreover, scholars have confirmed that the entrepreneurial spirit can be enhanced through entrepreneurship education. One important gap in the scientific literature in this area involves research on the evaluation of such education.. The focus of this study is on developing an instrument in which scaled behavioural indicators will be used as a basis for giving concrete feedback to the students instead of using Likert-scale surveys. Based on a criterion-driven literature study 11 sub-competences that together constitute entrepreneurship in a behaviour-oriented and for educational purposes feasible way have been defined. These sub-competences were further subdivided into various behavioural indicators which formed the basis for creating an evaluation instrument. Next the instrument has been validated in a sample of 201 secondary education students at the beginning of an EE-trajectory. The validity and reliability of the resulting instrument was tested through a combination of qualitative and quantitative techniques. The validity check revealed a strong cohesion of the sub-competences we distinguished from the review which is coherent with research that defines entrepreneurial competency as an over-arching construct. Finally 21 items were retained in an instrument that is sufficiently reliable and valid to warrant further application in the coaching of entrepreneurship education. To conclude the opportunities for fostering entrepreneurship education by using this instrument are discussed.

Keywords: entrepreneurial competence, entrepreneurship education, evaluation, evaluation instrument

Introduction

By stimulating an entrepreneurial spirit within all types of education and training, Europe hopes to offer an answer to the persistent economic crisis it has been experiencing for several years (ET2020, ec.europa.eu). As confirmed in a study by Birch (1987), entrepreneurship contributes to sustainable economic development. At the European level there is the recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC) in which the European countries are encouraged to work on a sense of initiative and entrepreneurship on different levels. In Flanders, efforts are being made to promote an entrepreneurial spirit. More specifically, there is a desire to impart to *all* students the entrepreneurial skills and knowledge that are essential to independent entrepreneurship (*Actieplan Ondernemend onderwijs* Action Plan for Entrepreneurship Education, 2015-2019).

Along with the augmented interest from policymakers, we have seen a sharp increase in the number of studies on various aspects of entrepreneurship and its education. One important conclusion emerging from these studies is that entrepreneurship can, indeed, be taught through entrepreneurship education (Dickson, Solomon & Weaver, 2008; Fayolle, Gailly & Lassas-Clerc, 2005; Kuratko, 2005; Van den Berghe, 2007). This said there seems to remain uncertainty regarding the content and organisation of entrepreneurship education. As early as 1987, Ronstadt posed questions concerning what should be learned and in which manner. As to the content, according to a study by Neck and Greene (2011), there still is little consensus to date regarding the learning objectives to be pursued in entrepreneurship education. The increasing attention in entrepreneurship has led to an abundance of definitions and interpretations regarding the concepts entrepreneurial spirit and entrepreneurial competence. One recurrent element in these definitions concerns with generating ideas and the ability to realise them. Moreover, the entrepreneurial spirit is often described in terms of capacity, thereby corresponding to the concept of competence (Fouad et al., 2009). Lans, Hulsink, Baert and Mulder (2008) argued that teaching entrepreneurial competence could develop an entrepreneurial spirit. This concept is an overarching construct that can be linked to a variety of sub-competences (Pittaway et al., 2009; Gibb, 2002, 2008; Lans, Blok & Wesslink, 2014; Edwards-Schachter, Garcia-Granero, Sanchez-Barrioluengo, Quesada-Pineda & Amara, 2015), including initiative taking, creativity, performance orientation, problem-solving, risk

appetite, capacity for reflection and communication skills (Baert & Camertijn, 2007; Gibb, 2008; Laevers & Bertrandts, 2004; Van den Berghe, 2007; Van der Kuip & Verheul, 2003). Given the large number of sub-competences mentioned in the literature, this study devotes attention to the selection of those sub-competences that can be applied in a targeted, feasible and didactically sound manner within entrepreneurship education as they form the basis of the entrepreneurial learning environment and shape the appropriate evaluation method (Van der Kuip & Verheul, 2003; Draycott & Rae, 2011; Biggs, 2003; Schelfhout, Dochy & Janssens, 2004). Entrepreneurship education cannot solely be organised as part of more traditional forms of teaching. The increase in the use of student companies and business games within the context of both secondary and higher education (Van den Berghe, 2007; Pittz, 2014; Solomon, Duffy & Tarabishy, 2002) is exemplary to it. As a consequence, there is also a need for new evaluation instruments, which are currently underdeveloped and which have yet to be examined with regard to their applicability (Gibb, 2008; Pittaway, Hannon, Gibb & Thompson, 2009; Draycott & Rae, 2011; Pittaway & Edwards, 2012). Feasibility and usefulness within a didactical process, adapted to the needs of the considered educational level, are hereby essential (see, e.g., Schelfhout, Dochy & Janssens, 2004; Pittaway & Edwards, 2012). In order to bridge the gap between theory and (evaluation) practice, this study attempts to develop an evaluation instrument that can be applied in entrepreneurial education.

Many scholars agree upon the importance of teaching entrepreneurial qualities at an early age, starting from primary and secondary education (Laevers & Bertrandts, 2004; Rushing, 1990, Kourilsky & Carlson, 1997, Mulder, 1997, Van der Kuip & Verheul, 2003). Nevertheless we found that the vast majority of research occurs in the context of higher education. This study focuses upon the context of secondary education and more specifically on students aged 16 to 18 years old in the transition to higher education. If we are to stimulate an entrepreneurial spirit through education, we will first have to identify the sub-competences of entrepreneurial competence that should be addressed in such education. We then determine how such education should be properly evaluated and develop an evaluation instrument that can be used in a feasible and useful way. To this end, the research questions in this study are as follows:

RQ1 Which sub-competences define entrepreneurial spirit?

RQ2 What does an instrument look like that measures entrepreneurial spirit among third grade secondary education students using these sub-competences?

Theoretical framework

Learning processes in entrepreneurial education

Over the last decade, a lot of initiatives were set up in order to enhance entrepreneurship in primary and secondary schools in Flanders: several organisations develop and facilitate student projects as student companies, business games, simulations, ... In 2009, 35% of all secondary schools participate in learning companies, whereby students set up and run their own company (Van den Berghe, Lepoutre, Crijns & Tillleuil, 2009). Those initiatives match with the general opinion that entrepreneurship is best taught through activity and experience (Gibb, 1997; Minniti & Bygave, 2001; Cope, 2003). These initiatives generate a relevant pedagogical context wherein entrepreneurial competence can be learned as it offers different external factors to enrich the learning process (Man, 2012). The research strand on experiential learning is informative for understanding the learning processes, which take place in these authentic learning environments (Cope, 2001). Because of the intense character of the (learning) experiences in these kind environments (Schelfhout et al., 2004), intense reflection on these experiences can also be triggered, leading to 'transformative learning' (Cope, 2003; Taylor and Thorpe, 2004). As Higgins, Smith & Mirza (2013) indicate: 'The engagement of the entrepreneur in experiential learning necessities one to move from passive ideas of learning to a method of learning which requires them to take control and ownership of their own learning, assuming the role of an inquirer, negotiator, decision maker and mediator. Thus, two main challenges emerge for the establishment of effective experiential learning as a practice, firstly determining a relevant context and secondly the importance of a strong underpinning pedagogical approach which seeks to support and frame the acquisition of skills and competencies.' (p.143). Entrepreneurial learning should be seen as a process of making sense out of experience (Rae, 1999). Therefore, in successful entrepreneurial learning, an active interpretation of experience by the entrepreneurs is essential, and it can be seen as a process whereby concepts are derived from and continuously modified by experience (Man, 2012). In the model of Man (2012), entrepreneurial learning is shown to be an open, generative, iterative and self-reinforcing process. The entrepreneurial learning process is found to comprise three transformative processes, namely accumulating experience through carrying out entrepreneurial tasks, consolidating learning outcomes from experience, and applying or transferring one's own and others' learning outcomes when carrying out the tasks. The processes

are under the influence of the learning contexts and the learning behaviours are reinforced throughout the process. Based on the analysis, a model of entrepreneurial learning centred upon the learning behaviours has been constructed (see figure 1).

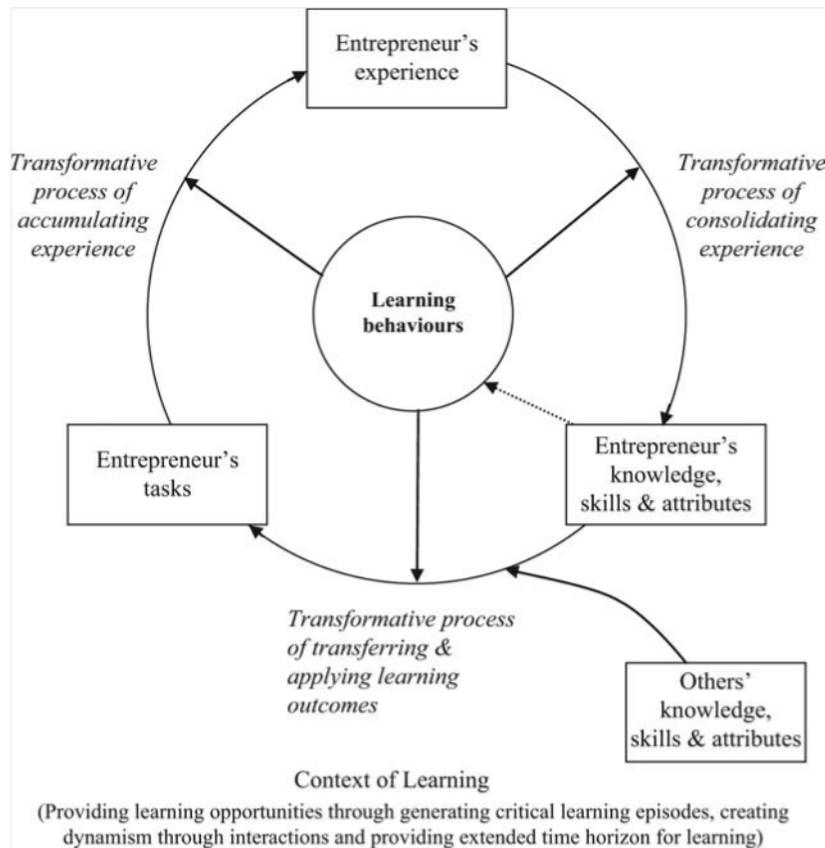


Figure 1. Model on entrepreneurial learning (Man, 2012),

A number of consequences flow from these demanding learning's processes. First, these learning processes correspond to a certain degree with the learning goals related to acquiring entrepreneurial competence, but definitely don't fully coincide with them. This has as a consequence that a) there is a need for a coach who will shape, support and guard the needed learning processes in order to avoid missing learning opportunities or even creating negative learning results (Schelfhout, et al., 2004) and b) there is a need for delineating the competences which can be put forward as learning goals, taking into account the prior knowledge and developmental level of the pupils/students (Laevers & Bertrands, 2004). Second, and also as a consequence of the former, there is a need for the coach to get a feasible but well-informed view on where the learner stands on different moments in the learning process to be able to give competence-focused feedback (Draycott, Rae and Vause, 2011; Man, 2012; Schelfhout et al., 2004).

Competence-focused learning and evaluation

Although entrepreneurship education does not necessarily *need* to be competence focused, various researchers have drawn connections between entrepreneurship education and competence-focused learning (Baert & Camertijn, 2007; Gibb, 2002, 2008; Lans et al., 2008; Man, 2006; Morris, Webb, Fu & Singhal, 2013; Schelfhout et al., 2004, Schelfhout, Gijbels, Van den Bossche & Verhaegen, 2013). In the following section, we first reflect on some relevant theoretical viewpoints related to entrepreneurial competence, then consider the guidance provided by the literature with regard to the operationalization of competences. We then devote attention to the evaluation of entrepreneurial competence and the practical implications for the development of the evaluation instrument. Lans et al. (2008) describe competence as a combination of core components, which are not independent from each other and should be handled in an integrated way. According to Le Deist & Winterton (2005) entrepreneurial competence should include cognitive competence (knowledge related to and understanding of entrepreneurship), functional competence (entrepreneurial skills and know-how) and behavioural competence (know how to behave). These three different components should be handled differently in education. Whereas cognitive and functional competence can be trained and evaluated in a more traditional way, the behavioural component needs a more process-based approach in which feedback and feed forward play a vital role (Le Deist & Winterton, 2005).

As often indicated in the literature, the operationalization and specification of competences should be based on behavioural indicators (Baert & Camertijn, 2007; Blömeke, Zlatkin-Troitschanskaia, Kuhn & Fege, 2013; Cardona, Velez & Tobon, 2013; Dochy & Nickmans, 2005; Draganidis, Fotis & Mentzas, 2006; Fouad et al., 2009; Van Beirendonck, 2010; Van den Berghe, 2007; Van den Bossche, Donche, Gijbels, De Groof, Delbecque & Leppens, 2011; Van Petegem & Vanhoof, 2002). In other words, they should be based on 'descriptions of concrete, observable behaviour that demonstrates the presence of a competence' (Van den Bossche et al., p.10). Van Beirendonck (2010) provides guidelines for constructing these behavioural indicators, arguing that their formulations should be behaviour-focused, simple, positive and free of value judgements. Other authors (Blömeke et al., 2013; Cardona et al., 2013; Fouad et al., 2009; Carracio, Wolfsthal, Englander, Ferentz & Martin, 2002; Van den Bossche et al., 2011) further added that each competence should ideally be linked to levels of mastery. Each level of mastery should be accompanied by a description of the concrete and

observable behaviour associated with it. These descriptions should be optimally coordinated to the profile of the individual learner, as well as to the learning environment and must be able to support the didactical process (Fouad et al., 2009; Van den Bossche et al., 2011). Finally, researchers have indicated that the description of various levels and the behavioural indicators associated with them should reflect a student's learning process. This would allow the behavioural indicators to be applied in a process-oriented evaluation of competences (Draganidis et al., 2006; Fouad et al., 2009; Huisman, 2001; Van den Bossche et al., 2011).

A choice for scaled behavioural indicators to assess entrepreneurial competence

In line with scholars who advocate entrepreneurship education to focus on the development of entrepreneurial values and behaviour (Gibb, 2002, 2008; Baert & Camertijn, 2007; Morris, Webb, Fu & Singhal, 2013), this study does not consider evaluating specific technical knowledge and skills that an entrepreneur should possess. In our search for sub-competences within entrepreneurship education, we focus solely on assessing 'generic entrepreneurial competence' (Baert & Camertijn, 2007, Govaerts, Dox, Houblon, Maes, Sekeris & Wielockx, 2014). As a starting point for this research, we examined contemporary instruments for measuring the presence of entrepreneurial spirit and found that they all make use of Likert scales (Baert & Camertijn, 2007; Driessens, 2005; Goossens & Verrue, 2004, Morris et al., 2013). Originally, however, Likert scales were specifically designed for charting attitudes, views and convictions (Cohen, Manion & Morrison, 2007; DeVellis, 2003; Likert, 1932). As such Likert scales do not provide the necessary information on the *behaviour* of students, essential for evaluating the student's progress. This contradicts with the need for evidence-based knowledge related to the evaluation of competencies as described above (Carracio et al., 2002; Dochy & Nickmans, 2005; Fouad et al., 2009), which indicates that scaled behavioural indicators are to be used in evaluating competencies. Furthermore, these indicators can be deployed in more concrete feedback loops given to the students during and after evaluating their competence level as they clearly indicate what behaviour students (should) (not) exhibit when mastering a certain competence. It is often assumed that responses to a Likert scale (e.g., from 1 to 5) are scaled, not only at the ordinal level, but at the interval level as well. Enquiries about the various aspects of entrepreneurial competence assume that all respondents interpret the concept of 'distance' between the various response categories in the same way, even though such is highly

unlikely (Matell & Jacoby, 1971). A second reason for avoiding Likert scales in the instrument has to do with the impact of social comparisons that respondents make when responding to Likert scales (Ogden & Lo, 2012). Respondents use people from their own surroundings as a frame of reference, on which they subsequently base their responses. For our research, this implies that respondents based their own responses upon the estimated entrepreneurial spirit of the students in their own environment. In this way the objective character of the assessment can be reduced. Furthermore, as argued by Rapkin and Schwartz (2014), the answers that respondents give are also dependent upon their convictions regarding their stance in life (or the stance they feel they should have). For our study, this implies that, when completing the instrument, students are likely to profile themselves against their classmates and age peers. The scores that they assign to themselves could thus be dependent upon their own individual contexts and are based upon non-observable convictions instead of observable behaviour. The final argument also concerns the impact of context on the completion of Likert scales. Because Likert scales do not offer any concrete guidance, the respondent's emotional state at the time of completing the scales could be an important influential factor (Blaikie, 2003; Kieruj & Moors, 2010).

Based on the former theoretical considerations, the following guidelines will support the development of an instrument that can be applied in the evaluation of entrepreneurial education. First, in search of the sub-competence that should be included in the instrument, we should focus on the sub-competences of the *generic* entrepreneurial competence that are *learnable* in the context of entrepreneurial education. Secondly, scaled behavioural indicators should be used in the evaluation instrument, whereby we should pay considerable attention to the wording of the indicators, so they are fit for third grade secondary education students (16-18 years old). We will have to consider the influence of the respondents' individual frames of reference on the interpretation of the wording of each item (Rapkin & Schwartz, 2004; Ambrose, Philipp, Chauvot & Clement, 2003; Hodge & Gillespie, 2007), which is consistent with the views of Van den Bossche and colleagues (2011) that these behavioural indicators should correspond to the experiences and perceptions of the target group for which they are constructed. Thirdly, these scaled behavioural indicators will have to facilitate the teacher in giving feedback to his students. The indicators provide a clear view on the behaviour that should be exhibited when mastering a sub-competence. A final guideline is that the evaluation instrument that we are developing should also be suitable for

self-evaluation, peer evaluation and co-evaluation. A subsequent challenge here is to create an instrument making use of behavioural indicators which does not ask for business-like contexts or uses typically entrepreneurial terminology, so that it can be taken at the beginning of an EE-trajectory without any experience needed with the students.

Methodology

To improve our grasp of the sub-competences of entrepreneurial competence and their associated behavioural indicators, we conducted a review of the relevant literature. Although this review was not exhaustive, it was carried out broadly in order to theoretically underpin the development of the instrument. Defining sub-competences and underlying behavioural indicators formed the first focus of our research. The second focus was on the validation of the developed instrument according to *mixed method research*.

Sub-competences of entrepreneurial competence

As we are seeking to develop an instrument to evaluate generic entrepreneurial competence, the first goal of this research is to identify its most important sub-competences. Since the mid-1990s, the advance of (research on) entrepreneurship education has led to the rapid accumulation of relevant literature. For this study, we focus primarily on the literature dating from 1997 – 2016. Some renowned studies and reviews in the context of entrepreneurship education and the references in these studies formed the starting point of our targeted literature review (Gibb, Hannon, Price & Robertson, 2013; Gorman, Hanlon & King, 1997; Mitchelmore & Rowley, 2010; Van den Berghe, 2007; Walter & Block, 2016). Particularly valuable to our literature study are the learning outcomes from entrepreneurial education as described by Gibb et al. (2013). These learning outcomes can be seen as important goals of entrepreneurship education – in that way determining the expected learning processes - and are divided into eight categories. Gibb et al. (2013) further specified different developmental goals per learning outcome. An overview can be found in table 1.

Table 1. Learning outcomes from entrepreneurial education (Gibb et al., 2013)

Entrepreneurial behaviour, attitude and skill development
Entrepreneurship education clearly seeks to develop typical behaviour, attitude and skill, e.g. opportunity seeking, initiative taking, intuitive decision making with limited information, achievement orientation and incremental risk taking
Creating empathy with the entrepreneurial life world
Helping students to 'feel' and empathise with the life-world of the entrepreneur, such as living with uncertainty and complexity, learning by doing, copying, problem solving and working flexibly and long hours
Key entrepreneurial values
Inculcate and create empathy with key entrepreneurial values, such as strong sense of independence, hard work brings its rewards, strong action orientation and strong belief in freedom to take action
Motivation to Entrepreneurship career
Helping students to understand the benefits from an entrepreneurship career, entrepreneurial modelling
Understanding of processes of business entry and tasks
Students understand the process (stages) of setting up an organisation, the associated tasks and learning needs
Generic Entrepreneurship competencies
Students have the key generic competencies associated with entrepreneurship, e.g. opportunity-seeking, finding ideas, handling and learning from relationships.
Key minimum business how to's
Students have a grasp of key business how to's associated with the start-up process, e.g. Monitoring the environment, finance, sales, develop a business plan
Managing relationships
Students understand the nature of the relationships they need to develop with key stakeholders and are familiarised with them, e.g. identifying key stakeholders, understanding their needs, building and managing relationships.

As discussed in the theoretical framework we argued for the development of an evaluation instrument that focuses upon learnable behavioural competences. Therefore the following three learning outcomes from Gibb's overview are essential to our research: entrepreneurial behaviour, attitude and skill development, key entrepreneurial values and generic entrepreneurship competencies. As a first criterion for our literature search we focused on research and instruments

which take these aspects into account. Search queries in the ERIC database and through the Google Scholar search machine (using the following search terms: *entrepreneurship education or entrepreneurship or entrepreneurial competence and student evaluation and secondary education* and using the functions *cited by, related articles and Google scholar metrics*) yielded a variety of relevant articles to extend the literature study. We screened the abstracts of the articles obtained, taking into account the following criteria (derived from the theoretical framework and general methodological considerations):

- a) The over-arching concept entrepreneurial competence has to be divided into different sub-competences and further **operationalized through relevant behavioural indicators**, thus providing sufficient information on what possibly should be withheld in the instrument to be constructed;
- b) The formulated sub-competences/behavioural indicators are to be **based upon (other) validation research**, directly or indirectly;
- c) These sub-competences should be **sufficiently generic and not content-driven** (e.g. implying knowledge related to business administration) to serve as a basis for the instrument **targeted at third grade secondary education students**. Therefore, it is important that they contain sub-competences that are broadly relevant, even outside the context of independent entrepreneurship (Gibb, 2002; 2008; Van der Kuip & Verheul, 2003);
- d) We further considered the condition that it should be **possible to support the necessary learning processes** (Man, 2012), by means of deliberately creating learning environments and being able to support the needed reflective processes (Schelfhout, et al., 2004), for acquiring the selected sub-competences. Related, but more abstract concepts (e.g., the need for autonomy, self-efficacy and self-confidence) are components that are a lot more difficult to include in focused entrepreneurship education (Lans et al., 2008). Although they acknowledged that the aforementioned concepts play a role in the development of entrepreneurial competence, Lans et al. (2008) argued that they are more likely to act as an important lever for exhibiting the 'right' behaviour within the framework of a given sub-competence and are hard to act upon in the context of (entrepreneurial) education.

These criteria lead to an extensive further delineation whereby we finally had to be more lenient with criterion b because only a limited number of instruments evaluating entrepreneurship competence proved to be validated. Therefore instruments proven to be broadly useful without

being validated were included in our study as well. Based on criteria a) and b) 28 studies were retained as a basis to create an exhaustive overview of possible sub-competences of entrepreneurial competence (see the first row in table 2). From these studies only sub-competences were retained that met criteria c) and d). For each of these sub-competences associated behavioural indicators were derived from the studies that could be used in constructing the instrument (see the first column in table 2). To get an overview of how often these specific sub-competences and underlying behavioural indicators appear in the different studies we indicated this with X in table 2.

Table 2. Sub-competences of entrepreneurial competency and underlying behavioural indicators

Sub-competences of entrepreneurial competency And related behavioural indicators (Part I)	Athayde, 2009	Baert & Camertijn, 2007	Chang & Rieple, 2013	Chiru et al., 2012	Covin & Wales, 2012	Cunningham, 1991	Draycott, 2010	Draycott et al., 2011	Driessens, 2005	Govaerts et al., 2014	Gibb, 1998	Gibb, 2002	Goossens & Verrue, 2004	Hodzic, 2016	Laevers & Bertrands, 2004	Lans et al., 2011	Man, 2006	Man, 2012	Mitchellmore & Rowley,	Moberg et al., 2014	
1. Performance orientation	X			X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	
Setting challenging yet achievable goals				X		X	X	X	X	X	X	X	X	X	X	X				X	
Spontaneously improve performance				X		X			X	X					X	X					
High demands on quality of own work				X					X				X	X	X	X				X	
2. Creativity	X	X				X	X	X	X	X	X	X	X	X	X	X			X	X	
Easily invents original ideas or solutions				X		X	X	X	X	X	X	X	X	X	X				X		
No aversion to experiment						X		X	X				X							X	
Never labels ideas as ridiculous or useless							X	X		X											
3. Taking initiative		X					X	X		X	X	X	X	X	X		X		X	X	
Dares to take the first step													X								
Willing to try new methods or techniques		X				X			X				X			X		X			
Looking for opportunities	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
4. Taking calculated risks					X	X		X	X	X	X	X			X					X	
Willing to take risk for himself							X		X	X				X							
Thinking before acting							X														
Looks for information in a targeted manner				X			X									X					
Dares to make decisions					X		X		X						X						
5. Perseverance		X							X	X	X	X	X	X	X	X			X	X	
Willing to work hard									X	X	X	X	X	X	X						
Sets challenging targets and wants to achieve them									X		X	X	X	X	X	X				X	
Continues after setbacks									X			X	X	X	X	X				X	
Takes responsibility		X														X				X	
Has the necessary self-discipline																X				X	
6. Leadership	X	X	X			X	X	X	X	X	X	X	X	X	X	X			X	X	X
Brings others together and stimulates action	X			X		X			X	X	X	X	X	X	X	X			X	X	
Ensures that the group makes a decision	X							X				X	X	X	X						
Can allocate tasks to the appropriate people		X		X				X				X	X	X	X				X	X	
Can inspire and motivate others	X			X					X	X	X	X	X	X	X				X	X	

**Sub-competences of entrepreneurial competency
And related behavioural indicators
(Part II)**

	Athayde, 2009	Baert & Camertijn, 2007	Chang & Rieple, 2013	Chiru et al., 2012	Covin & Wales, 2012	Cunningham, 1991	Draycott, 2010	Draycott et al., 2011	Driessens, 2005	Govaerts et al., 2014	Gibb, 1998	Gibb, 2002	Hodzic, 2016	Goossens & Verrue, 2004	Laevens & Bertrands, 2004	Lans et al., 2011	Man, 2006	Man, 2012	Mitchelmore & Rowley,	Moberg et al., 2014	Morris et al., 2013	Oosterbeek et al., 2008	Scheiffout et al., 2004	Taatila & Down, 2012	Tiwari, 2011	Van den Berghe, 2007	Van der Kuip & Verheul,	Welsen, 2012
7. Communication skills	X	X					X	X	X	X	X	X	X	X	X				X	X	X		X	X				
Brings ideas convincingly	X		X			X		X	X	X				X	X					X	X			X		X		
Can listen actively										X					X								X	X				
Dares to talk to strangers of superiors	X	X						X	X	X						X					X	X		X				
Is assertive with respect for others	X																			X	X		X	X				
Defends own opinion																							X					
8. Planning & organising	X	X	X		X	X		X	X			X	X	X	X	X	X		X	X	X		X			X	X	
Can draw up a planning								X						X	X								X					X
Can divide bigger assignments into appropriate sub-tasks								X						X	X	X	X						X					
Can distinguish main issues from side issues								X								X	X											
Is flexible	X					X	X	X	X		X	X	X	X	X					X	X	X						X
Is willing to make an extra effort if needed															X		X				X					X		
9. Decisiveness	X		X	X	X	X	X	X	X			X	X	X	X				X	X	X	X				X		
Independently chooses and makes decisions				X	X	X	X	X	X			X	X	X	X					X	X	X				X	X	
Easily starts new projects															X							X						
Dares to make decisions				X	X	X	X	X	X					X	X						X					X		
10. Collaboration						X	X						X	X					X	X	X		X					X
Works actively and motivated with others			X				X							X	X	X				X	X		X					
Is empathetic and offers assistance where needed							X							X						X		X						
Sticks up for his own vision but is willing to let go if necessary							X							X					X	X								
11. Reflection	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	
Is critical to one's own contribution	X						X	X	X					X	X	X	X			X	X		X			X	X	
Is open to the criticism of others	X						X	X						X	X	X				X		X						X
Solves problems	X													X	X	X				X	X	X				X	X	
Learns from mistakes	X	X					X		X	X	X	X	X	X	X	X	X	X	X	X	X							X

Instrument development

The subsequent objective of this study is to use this overview as the basis to develop an instrument with which to chart the presence of entrepreneurial competence and to support teachers in their efforts to evaluate progress in this regard. We chose to develop an instrument that could be used as both an observation tool (e.g. which would allow teachers/coaches to give feedback) and as a questionnaire (e.g. as a means for self-evaluation and/or peer evaluation by the students). Based on the framework concerning competence-focused learning and evaluation (Van den Bossche et al., 2011; Dochy & Nickmans, 2005), we opted to avoid the use of Likert scales, instead, working with scaled behavioural indicators. Our goal is that the developed instrument will be able to reveal the extent to which a respondent has mastered these characteristic behavioural indicators. In order to determine whether students exhibit behaviour associated with the sub-competences to be assessed, we thus used examples from their own realms of experience. This explains why sub-competences of entrepreneurial competence as we operationalized them initially appear to be described according to behavioural indicators that cannot be directly linked to business operations or to functioning within a professional organisation. Further, because our instrument works with measures that are concrete and observable, we assume that the emotional state of a respondent should have less impact on the completion of the instrument, thus having less influence on the data gathered. We choose to divide each selected aspect of entrepreneurial competence (behavioural indicator) into four different levels of mastery: from absent to expert competency.

Initially, sixty-two items were developed according to the competence profile. During a pilot these items were then presented to seventeen students and their teachers (courses related to economics and commerce). The first goal of this pilot phase was to determine whether the students understood the various items. To this end, an additional response category (*'Not understood'*) was included in the instrument. Another goal was to determine whether the teachers of the students involved were able to form judgements about the items that had been included. Given that the items measure the extent to which concrete, observable behaviour is exhibited by the student, and given that the instrument was developed for use in the evaluation of entrepreneurship education, in that way we wanted to avoid including items on which the teachers were unable to form any judgements. Five teachers collaborated in this part of the study. During a next phase special

attention was given to the phrasing of the items, their uni-dimensionality and the need for the four answer categories to exclude one another within a team of three scholars.

To finally assess reliability and validity of the instrument, a *mixed methods* approach has been adopted, combining both qualitative and quantitative research techniques. The qualitative study was conducted according to the focus group technique. In addition to the opportunity to obtain rich information, focus interviews offer a way of testing and verifying findings (Cohen et al., 2007). Following Lynn (1986), who argued that at least five respondents should be questioned in order to determine cognitive validity, five students participated in this focus group. Data from this focus group were used for testing cognitive validity, for respondent validation and for controlling the extent to which students could correctly judge upon the grading of the answer categories. First, to ascertain cognitive validity (Glaser, 1997) the students were questioned upon their interpretation of each item. For each item, they were asked to indicate the behaviour level that best fitted them and to provide an example of a concrete situation in which they had exhibited the behaviour. A second goal of this qualitative study was to obtain respondent validation or a 'member check' (Mays & Pope, 2000). Prior to the focus interview, their teacher estimated the level of mastery for each of the five students. These estimates were then compared to the levels that the students assigned to themselves. The third and final component of the qualitative study involved having the students estimate the scaled levels of mastery. To this end, they were asked to arrange the levels of mastery for each question in the instrument, from least competent to most competent.

To obtain data for the quantitative component of the validation study, we administered a questionnaire to 201 students from 12 secondary schools in Flanders. All respondents were third grade secondary education students, aged from 16 to 18 years old, and were at the beginning of participating in a 'student company' which allowed for gaining experience with entrepreneurial competence (Schelfhout, et al., 2004) as a basis for the aimed at learning processes as described in the theoretical framework. In that way there was a totally authentic situation in which to take the questionnaire, namely at the beginning of a learning process to which the results of the questionnaires could be informative. To determine the permissibility of factor analysis, we appealed to the Kaiser-Meyer-Olkin (KMO) standard for determining the suitability of sample data, whereby

0.50 was considered the critical lower limit (Cohen et al., 2007). We used R to divide the quantitative data randomly into two subgroups. For the first group, we conducted a principal components analysis (PCA) with oblique rotation, given that the results of the literature review suggested that many underlying factors might be correlated with each other. This analysis had two goals: firstly, we sought to determine the structure and dimensionality of the data, in order to compare these aspects to the competence profile that we had constructed; secondly, we used the results of the PCA to determine which items would meaningfully load on a similar concept (in this case, entrepreneurial competence) and which items would best be eliminated from the instrument. To this end, we adopted a component loading with an absolute value higher than 0.30 as a critical boundary (Cohen et al., 2007). We then used confirmatory factor analysis (CFA) upon the second data-group to verify that the model emerging from the PCA corresponded sufficiently to the data. We used Cronbach's Alpha (ranging from 0 to 1) as the standard for determining the internal consistency of the scales. Values closer to 1 indicate greater internal consistency (Cohen et al., 2007; Kim & Mueller, 1978).

Results

Competence profile for an entrepreneurial spirit

The first research question concerns the sub-competences to be pursued within the context of entrepreneurial education. Based on a literature study 28 articles concerning entrepreneurial competence (sub-competences, traits, underlying behaviour) and concrete evaluation of entrepreneurial competence were retained. This yielded a list of 11 sub-competences (see table 2) that were all part of the over-arching construct of entrepreneurial competence. Based on the consulted literature these sub-competences were further described into a competence profile (see table 3). This informed description, together with the number of times that a specific kind of behaviour has been mentioned in the studies consulted (see table 2) formed the basis for delineating the behavioural indicators we retained for the instrument to be validated.

Table 3. Competence profile describing entrepreneurial competence

Performance orientation

Summary definition based upon Driessens 2005; Goossens & Verrue, 2004; Kourilsky, 1980; Laevers & Bertrands, 2004

and Van den Berghe, 2007.

You like to show what you are capable of. You like to experience success. You set challenging yet achievable goals. Je prefer to realize these goals in a creative and autonomous way. On your own initiative, you continuously want to improve by setting high standards to the quality of your own work and actively assimilate hints and learning opportunities. You show responsibility for your own mistakes.

Creativity

Summary definition based upon Gibb, 2008; Laevers & Bertrands, 2004 and Van Geetsom, 2008.

You have an open view to the world and manage to combine things from different areas of interest, which makes it easy for you to come up with a large number of original ideas or solutions. Furthermore, you have no fear of experimenting. You realize that the creative process benefits from group work because it can enrich your own ideas, and they can be adapted or matched to the ideas of others. You will never label others' ideas as ridiculous or useless, you stimulate others to experiment.

Taking initiative

Summary definition based upon Driessens, 2005; Laevers & Bertrands, 2004; Kourilsky, 1980 and Van den Berghe, 2007.

You are enthusiastic and can't sit still. You dare to make to first move and don't wait for others to do so: you make proposals of your own accord and spontaneously undertake action. You're adventurous and willing to try new methods, techniques or insights, not held in by difficulties or obstacles. You actively seek for new opportunities to work with.

Taking calculated risks

Summary definition based upon Gibb, 2008; Kourilsky, 1980; Laevers & Bertrands, 2004; Van den Berghe, 2007 and Van der Kuip & Verheul, 2003.

You dare to break new ground, you're not stopped by uncertainty and you believe in your own skills and gifts. You're willing to take risks that related to your personality (e.g. your image or personal investment). You accept that there is no 100% guaranty for success. You think before you act. You search for information in a targeted manner and evaluate it critically. You dare to make decisions, even in uncertain situation. You dare to experiment.

Perseverance

Summary definition based upon Lans et al., 2011; Moberg, 2014; Van den Berghe, 2007 and Van der Kuip & Verheul, 2003.

You remain focussed till the job is done. You don't give in despite setbacks. You're able to motivate yourself. You don't look for excuses when the task is not done properly.

Leadership

Summary definition based upon Driessens 2005; Goossens & Verrue, 2004; Laevers & Bertrands, 2004 and Van den Berghe, 2007.

You follow up upon the progression and quality of your own work and that of others. Your can delegate tasks and responsibilities to appropriate peers in a clear manner, taking into account their skills and gifts.

Communication skills

Summary definition based upon Laevers & Bertrands, 2004; Baert & Camertijn, 2007; Schelfhout et al., 2004 and Taatila & Down, 2012

You can communicate messages in such a way that the receiver gets the message. You can bring your ideas in a convincing way. You are an active listener. You are self-assured while communicating your ideas and defending your concerns, but this also with respect for the others.

Planning & organising

Summary definition based upon Driessens, 2005; Gibb, 2008; Laevers & Bertrands, 2004 and Van der Kuip & Verheul,

2003.

You can schedule a planning, taking into account time and place. You can distinguish main issues from less important ones. You're willing to undertake tasks in a flexible way and adapt to the needs of a group. Furthermore, you are prepared to go the extra mile if necessary.

Collaboration

Summary definition based upon Draycott, 2010; Laevers & Betrands, 2004 and Moris et al., 2013

You cooperate actively and motivated with peers to arrive at a common result. You're empathic and you build a network. You see needs and offer help where you can. You remain calm and control your emotions, even in moments where your group is encountering difficulties. You try to positively reinforce yourself and others. You stand up for your own vision but you're able to let go if necessary.

Reflection

Summary definition based upon Baert & Camertijn, 2004; Goossens & Verrue, 2004; Laevers & Bertrands, 2004; Man, 2006 and Morris et al., 2013

You're critical and accountable to your own contribution. You're open to criticism. You don't accept the course of events but critically and constructively reflect. You thereby take into account that the efforts (the energy en time spent on a task) should be efficient and not to exceed the returns (the eventual result of that task). If a working method does not prove to be efficient, you think about other methods or possibilities to come to a similar result. You solve problems by contriving creative and achievable alternatives. You don't throw in the towel but solve problems and learn from your mistakes.

The second objective of this study concerns the development of an instrument with which to chart and follow entrepreneurial competence in students. The 62 items that initially were developed to assess the 11 sub dimensions and 42 underlying indicators as showed in table 2 were tested by means of qualitative research during a pilot test phase, followed by a quantitative validation test. In response to the initial pilot test phase, 10 items were eliminated from the instrument: 4 because students indicated that they did not understand them and 6 because teachers found it nearly impossible to score the items based on observation. We subsequently presented the remaining items to two fellow researchers. They reviewed the items according to the language used (e.g. level of abstraction, possible misinterpretation, use of negatives) and the uni-dimensionality of the items. Based on this triangulation, we decided to eliminate 16 items and to revise the wording in 19 of the remaining items. This process resulted in an instrument containing 36 items. Table 4 provides information on the correspondence of the instrument to the sub-competences as retained from the literature study (see column 'Brief description').

Table 4. Instrument corresponding to the sub-competences as a basis for validity check (36 items)

Sub-competence	Brief description	Cognitive validity	Respondent validity	Respondent scaling	KMO	Factor loading 11-factors model	Factor loading 1-factor model
Performance	1. Control of one's own contribution	✓	4	1	.83	.63	.56
Orientation	2. Quality of (home) work	✓	5	5	.67	.25	.46
	3. Performance orientation encountering problems	✓	4	1	.72	.50	.43
	4. Keeping focus on tasks	✓	4	2	.75	.46	.40
	5. Valuing original ideas	✓	5	3	.68	.45	.38
Creativity	6. Inventing original ideas	✓	4	4	.70	.43	.41
	7. Converting original ideas into concrete plans	-	2	2			
	8. Seeks for solutions/ideas with others	-	2	2			
	9. Takes initiative when task has ended	✓	5	3	.77	.50	.41
Taking initiative	10. Critically examines proposed methods	✓	4	1	.46	-	-
	11. Takes calculated risks	✓	4	0	.67	.43	.36
Taking calculated risks	12. Looks for information in a targeted manner	✓	5	4	.78	.26	.40
	13. Needs to be encouraged when performing difficult tasks	✓	5	4	.74	.31	.56
Perseverance	14. Perseveres when encountering problems	✓	4	4	.68	.43	.34
	15. Enthusiasm	✓	5	1	.56	.25	-.09
Leadership	16. Brainstorms, shares plans or ideas in group	✓	4	3	.68	.48	.52
	17. Can lead a team	✓	5	3	.72	.31	.20
	18. Deals with resistance (when taking difficult decisions)	✓	4	1	.57	.26	-.10
	19. Listens actively	✓	5	1	.82	-	.53
Communication skills	20. Clarifies his own opinion	✓	5	3	.74	.43	.28
	21. Asks for clarification about other people's opinion	-	3	4			
	22. Convinces others	✓	5	5	.61	.48	.26
	23. Is open to criticism of others	✓	5	3	.84	.31	.40
	24. Executes urgent and/or important tasks	-	2	5			
Planning & organising	25. Goes the extra mile if needed	✓	4	5	.72	.63	.23
	26. Adapts plans to circumstances	✓	4	4	.65	.50	.31
	27. Takes additional tasks (flexibility)	-	3	4			
	28. Uses a plan	✓	4	3	.67	.25	.46
	29. Is able to make decisions	✓	4	4	.72	.43	.37
Decisiveness	30. Fulfilment of agreements	✓	5	4	.65	.46	.25
	31. Allocates tasks to appropriate people	✓	4	2	.78	.45	.38
	32. Reaction to other opinions	✓	4	1	.58	.25	.32
Collaboration	33. Assesses the quality of his own work	✓	4	3	.75	.63	.63
	34. Learns from mistakes	✓	4	4	.71	.31	.28
	35. Balances efforts and results	✓	5	3	.57	-	.27
	36. Evaluates his own working method	✓	4	0	.77	.46	.41

Validity and reliability of the instrument

During the focus interview, we questioned the respondents in order to establish the *cognitive validity* of the various items. According to the results, five of the thirty-six items (Converting (7), Solving (8), Clarity (20), Priorities (24), Flexibility (27),) could be eliminated from the instrument. Respondents were unable to situate the requested example behaviour within the right context, did not interpret the item as intended, or had difficulty imagining any concrete context relating to the item. During the focus interview, the respondents were further asked to score themselves on each item. These scores were compared to the scores that their teacher had assigned to the five students prior to the interview. Of these predictions, 83% corresponded to the scores assigned by the respondents (see table 4, column 'respondent validity' with the number of matching scores between teacher and respondents, with a maximum value of 5). Moreover, the items that were not correctly predicted corresponded to the items that could not be retained, based on the cognitive validation assessment. Therefore these five items (Converting (7), Solving (8), Clarity (20), Priorities (24), Flexibility (27)) were not included in further analysis. A final goal of the focus interview was to estimate the extent to which students were able to rank the scaled behavioural factors from least competent to most competent. Although the students reported that they had no difficulty with this task, only four of the items were scaled correctly by all of the students. The number of respondents correctly scaling each item (with a maximum value of 5) is reported in Table 4 (column 'respondent scaling').

The questionnaire containing 36 items was administered to 201 students from 12 secondary schools. The respondents were distributed equally by gender. To each item in the questionnaire, we assigned a score ranging from 1 to 4, with 1 representing least competent and 4 representing most competent. The variables that were shown to have insufficient cognitive validity were eliminated from the data file. We conducted a KMO analysis on the remaining 31-item dataset, in order to determine whether it would allow factor analysis. With the exception of the variable 'Critical' (item 10), all of the items met the KMO standard, with values ranging from 0.54 to 0.83. Therefore the variable 'Critical' was not included in further statistical analyses, as were the five items that did not pass the cognitive validity test (see above). Based on the results of this analysis, we decided that the

data met the conditions for conducting factor analysis. The KMO values for all items are presented in Table 4 (column 'KMO').

The first objective of the PCA was to identify the structure of the remaining 30 items emerging from the randomly split data. Analysis of the scree plot (Cattell, 1966) and the eigenvalues identified a solution with 11 factors as optimal for the instrument being developed. However, analysis of this model showed that the alpha values of the different factors were too low to be sufficiently internal consistent. Only one factor had a score higher than 0.60, all others had a very limited reliability. The alpha values of the different factors are stated in Table 4. Secondly, it proved difficult to adopt a coherent meaning to the different factors. Therefore, because most studies reveal that the sub-competences of entrepreneurial competence are part of one overarching concept 'entrepreneurial competence' and therefore show a strong cohesion (Edwards-Schachter et al., 2015; Gibb, 2002, 2008; Lans, Blok & Wesselink, 2014; Pittaway et al., 2009), we decided to compare the 11-factor model with a single factor model. This model was based on a PCA using only one factor. We thereby withheld all items with a minimal factor loading of 0.30. A comparison of the two models revealed that the single factor model fits significantly better than the PCA-model with 11 factors ($p < 0.05$).

To determine whether the instrument truly does measure the presence of entrepreneurial competence, we assessed its construct validity through the CFA (Cohen et al., 2007). According to the results of the CFA, this one-factor model had a satisfactory fit with the data ($\chi^2 = 0.00$, CFI = 0.839, RMSEA 0.04). Only those items with factor loadings of at least 0.30 (Cohen et al., 2007) were included in the ultimate questionnaire. The items: Enthusiasm (15), Lead (17), Resistance (18), Opinion (20), Convince (22), Effort (23), Agreements (30), Mistakes (34), Balances (35) were therefore excluded from the final instrument. The factor loadings of the 21 selected items varied from 0.31 to 0.63. An overview of the factor loading per item is given in Table 4 (see column 'Factor loading 1-factor model'). We used Cronbach's Alpha as the standard for assessing the internal consistency of the scales that had been developed. The internal consistency of the entire measuring instrument containing the 21 items retained from the PCA analysis was good ($\alpha = 0.78$) (Kim & Mueller, 1978). No improvement would result from eliminating items from the instrument.

Discussion and Conclusion

In recent years, entrepreneurship education has been a point of major interest for policymakers and researchers. This type of education can stimulate the development of an entrepreneurial spirit (Dickson et al., 2008; Kuratko, 2005; Van den Berghe, 2007). In its turn, the entrepreneurial spirit contributes to sustainable economic growth (Birch, 1987). Scholars concluded that an entrepreneurial spirit is learnable through gradually acquiring entrepreneurial competence (Lans et al., 2008). However, according to the literature, considerable uncertainty still exists with regard to the content of entrepreneurship education (Neck & Greene, 2011). An important starting point for this study is the lack of research into the evaluation instruments used within entrepreneurship education (Draycott & Rae, 2011; Gibb, 2008; Pittaway et al., 2009). Scholars observed that the teachers involved perceive the evaluation of entrepreneurship education as difficult and challenging. In this regard, Pittaway et al. (2009) pointed to a need for the development of new evaluation instruments. Such instruments should offer the teachers involved the possibility to map their students' behaviour and to adjust it via feedback thus initiating a qualitative didactical process. The instrument that has been developed for the purpose of this study, creates opportunities for teachers to give guidance and to coach their students at the level of the different sub-competences linked to entrepreneurial competency. Based on a literature review, starting from a number of guidelines, the over-arching construct of entrepreneurial competence has been divided into 11 sub-competences. For each sub-competence a number of appropriate behavioural indicators were derived from the literature. For the instrument to be developed, we operationalized these behavioural indicators in four answer categories, from absent to expert competency. Both teacher and student, through the scaled behavioural indicators, can receive information about the behaviour a student shows at a certain point in his learning process and about the behaviour that is linked to expert competency. As Lans et al (2008) stated, competence development results from a dialogue between teacher and students. It is thereby essential that competence development arises from discussion, mutual agreement on further learning processes needed and coaching rather than from ticking an evaluation template. The competence profile as we developed it based on the literature study (see table 3) can further scaffold teachers in giving feedback to their students: it

explains the selected sub-competence in a practically useful way thus enabling both teacher and students to identify strengths and weaknesses in the entrepreneurial profile of the latter. This explicit attention for the didactical use has been advocated by different scholars (Duval-Couetil, Reed-Rhoads and Haghghi, 2010; Fayolle, Gailly and Lassas-Clerc, 2006; Pittaway et al., 2009). However further research is needed on how the interaction between implementing concrete evaluation instruments and learning processes can be optimized (Duval-Couetil, 2013). Although we stress that we do not underestimate the importance of business knowledge of entrepreneurship and specific know-how in order to become a successful entrepreneur, the literature reveals that an entrepreneurial spirit mostly is taught through gaining positive experiences in creatively taking initiatives and that this learning process is best started at a young age (Laevers & Bertrands, 2004; Van der Kuip & Verheul, 2003). Inside this set of positive experiences, a number of clearly distinct, yet strongly associated sub-competences of entrepreneurial competency, should be addressed. Our instrument focuses upon the different generic sub-competences of the over-arching construct entrepreneurial competence and was specifically designed for third grade secondary education students.

The validity and reliability of the resulting instrument was tested through a combination of qualitative and quantitative research techniques. The results indicate that the instrument is sufficiently reliable and valid to warrant further application in the coaching of entrepreneurship education. The validity check revealed a strong cohesion of the different sub-dimensions we distinguished from the literature review. This observation corresponds with research that defines entrepreneurial competency as an over-arching construct (Edwards-Schachter et al., 2015; Gibb, 2002, 2008; Lans, Blok & Wesselink, 2014; Pittaway et al., 2009). Therefore, based on the factor analyses we decided to approach entrepreneurial competence as a coherent set of competences within a one factor solution. The different items that were retained within this factor showed a high internal consistency (0.78), making the instrument sufficiently reliable. One important cautionary note with regard to these statistical analyses is that they are based on categorical data (a behavioural scale instead of the traditional Likert-scale). Although we included only those items that met the KMO standard in the analysis, we must note that the nature of the variables can bear a

serious influence on the results of the statistical analyses. Future studies on instruments measuring entrepreneurial competence that clearly draw upon behavioural indicators could use the Rasch model. This would help to counter any claims concerning the inequality of intervals between the various levels, although the same argument can be used for questioning the validity of instruments based on the use of Likert scales (Matell & Jacoby, 1971). Altogether, we argue that by developing this instrument we met an existing gap related to evaluating entrepreneurship education and hope to trigger a new approach to evaluate entrepreneurial competence supported by research. To our knowledge, no instruments using scaled behavioural indicators have been developed to date. The current instruments for mapping the entrepreneurial spirit and/or entrepreneurial competency are all self-reporting questionnaires, using Likert scales (Baert & Camertijn, 2007; Driessens, 2005; Goossens & Verrue, 2004; Morris et al., 2013). The literature showed important limitations of this method: self-reporting using Likert scales involves the risk of social comparison (Ogden & Lo, 2012) and could depend upon the convictions of the respondents (Rapkin & Schwartz, 2004) and the influence of respondents' individual reference frames (Ambrose et al., 2003; Hodge & Gillespie, 2007). Furthermore, the emotional state of mind of the individual respondent at the time of filling in the questionnaire appears to be an important influencing factor (Blaikie, 2002; Kieruj & Moors, 2010). An added value of the instrument as developed appears to be using scaled behavioural indicators which can contribute in countering these biases.

This brings us to a last but essential point of discussion: how to use this instrument to successfully foster the entrepreneurial learning processes of the students? Which conditions have to be fulfilled? What is the role of the assessor/teacher? Although this wasn't the focus of this research, the instrument has been developed with specific EE-goals in mind. We argue that two (major) strands of research are essential in reflecting on how the interaction between evaluation instruments and EE should be shaped. First there is the body of research on 'evaluation to support learning processes', also specifically applied to evaluating competences. Second there is the body of research on 'powerful learning environments' and the role of the teacher. The enormous wealth of insights stemming from these strands could be applied to EE. Hereafter some reflections.

Traditional educational learning environments tend to operate primarily according to product evaluation determined by the teacher: objectives are formulated and, following instruction, tested according to examinations or tasks. In a competence-focused learning environment, such classic tests are less than optimal (Boud, 1995; Dochy, Schelfhout & Janssens, 2003). There is a clear need to gather information on the behaviour of students to be able - as a teacher or as a coach - to evaluate their progress (Carracio et al., 2002; Dochy & Nickmans, 2005; Fouad et al., 2009). Research indicates the importance of structuring the reflection on learning progress in a systematic and process-oriented way (Sluijsmans, Dochy & Moerkerke, 1999). In this regard, it will be important to create encouraging, sometimes even compulsory opportunities, to make learners reflect on where they stand early enough in the learning process. But only the teacher as a source of information will not suffice. Self-evaluation, peer evaluation and co-evaluation provide students with a more complete image of the behaviour that they exhibit in certain situation and the confrontation between these different sources will trigger a deeper level of reflection (Dochy, Schelfhout & Janssens, 2003; Earl, 2012; Panadero & Dochy, 2014). The information gathered through self-evaluation, peer evaluation and co-evaluation generates feedback that can help students to become aware of the gap between the desired level of mastery in the selected competences and their own performance and forms an important basis for a qualitative didactical process (Carracio & Englander, 2004; Van den Bergh, Mortelmans, Spooren, Van Petegem, Gijbels & Vanthournout, 2006). This allows teachers to encourage their students to take action that could bring them closer to achieving the desired level of mastery for each competence addressed (Sandberg, 2000), which also specifically holds for the context of EE (Schelfhout, et al., 2004).

An important benefit of the instrument that we have developed is that it can be applied for self-evaluation, peer evaluation and co-evaluation and this also at the beginning of the learning process, because the instrument avoids asking for behavioural indicators based within typical business-like contexts or using typically entrepreneurial terminology, which can be problematic in EE-evaluation (Pittaway et al., 2009). Based on the outcomes of the evaluation instrument developed in this study, the coaching teacher can use feedback and dialogue to work with students, on an individual as well as group level basis, to determine which aspects they should be working on in order to become

more competent. Based on former research (Schelfhout et al., 2004) we stress the role of the teacher-coach in encouraging and supporting entrepreneurial competence learning. Merely providing a learning context, even when including self- and peer evaluation instruments, is not sufficient. When designing an entrepreneurial education context, more attention should be given to the complexity of learning processes to which the motivating, activating, coaching and structuring/steering roles of the teacher/coach should be tuned (Schelfhout, et al., 2006). An important focus hereby is that the scaffolding of the learning processes should be adapted to the initial situation of the students and that these processes should remain feasible. Therefore it is necessary that – depending on the age of the students – the supporting evaluation instruments are not excessive in what is to be evaluated and thus expected. We therefore question entrepreneurial competence instruments aiming for secondary education, whereby too many and too complex behavioural indicators are examined. It is essential that the teacher-coach will be able to keep the balance between developing a challenging learning environment where students have to regulate their entrepreneurial learning processes themselves, the teacher-coach setting clear and challenging expectations and the teacher-coach supporting these learning process through timely feedback, even steering these processes where needed (Schelfhout, et al., 2004), which is in line with the emerging research and modelling on entrepreneurial learning (Man, 2012).

To conclude, we hope that using the instrument as developed based on the competence profile can help teachers to become more aware of the different levels and sub-competences of entrepreneurial competence and anticipate more accurately. This will enhance their capability of giving targeted feedback to their students, which has been demonstrated as being crucial in the development of entrepreneurial spirit (Lans et al., 2008; Man, 2012). Given the important role of the teacher/coach we point to the necessity of further research concerning the didactic application of the instrument developed here and the mutual influence emanating from the different parties involved.

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