ENTREPRENEURSHIP IN EDUCATION

WHAT, WHY, WHEN, HOW

ENTREPRENEURSHIP360 BACKGROUND PAPER

MARTIN LACKÉUS, 2015

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Martin Lackéus, 2015

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INTRODUCTION

1. The idea of infusing entrepreneurship into education has spurred much enthusiasm in the last few decades. A myriad of effects has been stated to result from this, such as economic growth, job creation and increased societal resilience, but also individual growth, increased school engagement and improved equality. Putting this idea into practice has however posed significant challenges alongside the stated positive effects. Lack of time and resources, teachers' fear of commercialism, impeding educational structures, assessment difficulties and lack of definitional clarity are some of the challenges practitioners have encountered when trying to infuse entrepreneurship into education.

2. This report aims to clarify some basic tenets of entrepreneurship in education, focusing on what it is, why it is relevant to society, when it is applied or not and how to do it in practice. The intended audience of this report is practitioners in educational institutions, and the basis of this clarification attempt consists primarily of existing research in the domains of entrepreneurship, education, psychology and philosophy. Where research is scarce the author of this report will attempt to give some guidance based on own conducted research.

3. *What* we mean when we discuss entrepreneurship in education differs significantly. Some mean that students should be encouraged to start up their own company. This leans on a rather narrow definition of entrepreneurship viewed as starting a business. Others mean that it is not at all about starting new organizations, but that it instead is about making students more creative, opportunity oriented, proactive and innovative, adhering to a wide definition of entrepreneurship relevant to all walks in life. This report takes the stance that a common denominator between these differing approaches is that all students can and should train their ability and willingness to create value for other people. This is at the core of entrepreneurship and is also a competence that all citizens increasingly need to have in today's society, regardless of career choice. Creating new organizations is then viewed as one of many different means for creating value.

4. *Why* entrepreneurship is relevant to education has so far primarily been viewed from economic points of view. This has worked fairly well for elective courses on higher education level, but is more problematic when infusing entrepreneurship into primary and secondary levels of education for all students. Here, a much less discussed but highly interesting impact that entrepreneurship can have on education is the high levels of student motivation and engagement it can trigger, and also the resulting deep learning. This report will argue that in line with a progression model of when to infuse entrepreneurship into education, the question of what effects to focus on should also be progressively changing over time in the educational system. Students can become highly motivated and engaged by creating value to other people based on the knowledge they acquire, and this can fuel deep learning and illustrate the practical relevancy of the knowledge in question. Those students that pick up strong interest and aptitude for value creation can then continue with elective courses and programs focusing on how to organize value creation processes by building new organizations. Such an approach has far-reaching implications on how to plan, execute and assess entrepreneurship in education, and they will be discussed in this report.

5. *When* we should infuse entrepreneurship into education is increasingly clear in theory, but in practice much remains to be done. In theory we should start at an early age with a wide definition of entrepreneurship embedded across the curriculum and relevant to all students, preferably in preschool and primary school. Later in the educational system we should complement with a parallel voluntary and more business-focused approach, applying a more narrow definition of entrepreneurship. In practice however, explicit entrepreneurial activities on primary education levels are rare. And on secondary and tertiary levels most initiatives are business start-up focused, lacking embeddedness into other teaching subjects. In vocational education and training, entrepreneurial activities are frequent in terms of value creation for other people, but they are seldom connected to the entrepreneurship domain and its tools, methods and processes for creating value.

6. *How* to make students more entrepreneurial is probably the most difficult *and* important question in this domain. Many researchers claim that the only way to make people more entrepreneurial is by applying a learning-by-doing approach. But then the question of learning-by-doing-*what* needs to be properly answered. There is increasing consensus among researchers that letting students work in interdisciplinary teams and interact with people outside school / university is a particularly powerful way to develop entrepreneurial competencies among students. However, if this kind of experiential learning based activity is to be classified as entrepreneurial, some kind of value needs to be created for the people outside school or university in the process. It is not sufficient to just interact with outside stakeholders without a clear end result. For this to work in practice, teachers can draw on the entrepreneurship domain which contains many useful value creation tools, methods and processes. This report will outline some of them.

7. *Future* challenges and opportunities abound in entrepreneurial education. This report will try to outline some of them through a final section in each of the following chapters.

WHAT IS ENTREPRENEURSHIP IN EDUCATION?

8. This chapter starts with a discussion on the different terms used for describing entrepreneurship in education. Then various definitions are outlined and discussed. Value creation is presented as a commonality uniting different views in the field. Entrepreneurial competencies are discussed and exemplified through some competencies often termed as entrepreneurial. Based on these different terms and concepts, connections to general education are made by contrasting different pedagogical approaches and discussions. Some theoretical roots to entrepreneurship in education are given and briefly discussed.

1.1 Terminology of entrepreneurship in education

9. The two most frequent terms used in this field are *enterprise education* and *entrepreneurship education.* The term enterprise education is primarily used in United Kingdom, and has been defined as focusing more broadly on personal development, mindset, skills and abilities, whereas the term entrepreneurship education has been defined to focus more on the specific context of setting up a venture and becoming self-employed (QAA, 2012, Mahieu, 2006). In United States, the only term used is entrepreneurship education (Erkkilä, 2000). Some researchers use the longer term *enterprise and entrepreneurship education* (See for example Hannon, 2005), which is more clear but perhaps a

bit unpractical. Sometimes enterprise and entrepreneurship education is discussed by using the term entrepreneurship education only, which however opens up for misunderstanding. Erkkilä (2000) has proposed the unifying term *entrepreneurial education* as encompassing both enterprise and entrepreneurship education. This term will be used extensively in this report to avoid confusion. Further, the word "student" will in this report be used for learners on all levels of education, rather than adding the word "pupil" that some still use. For an overview of terms, see figure 1.

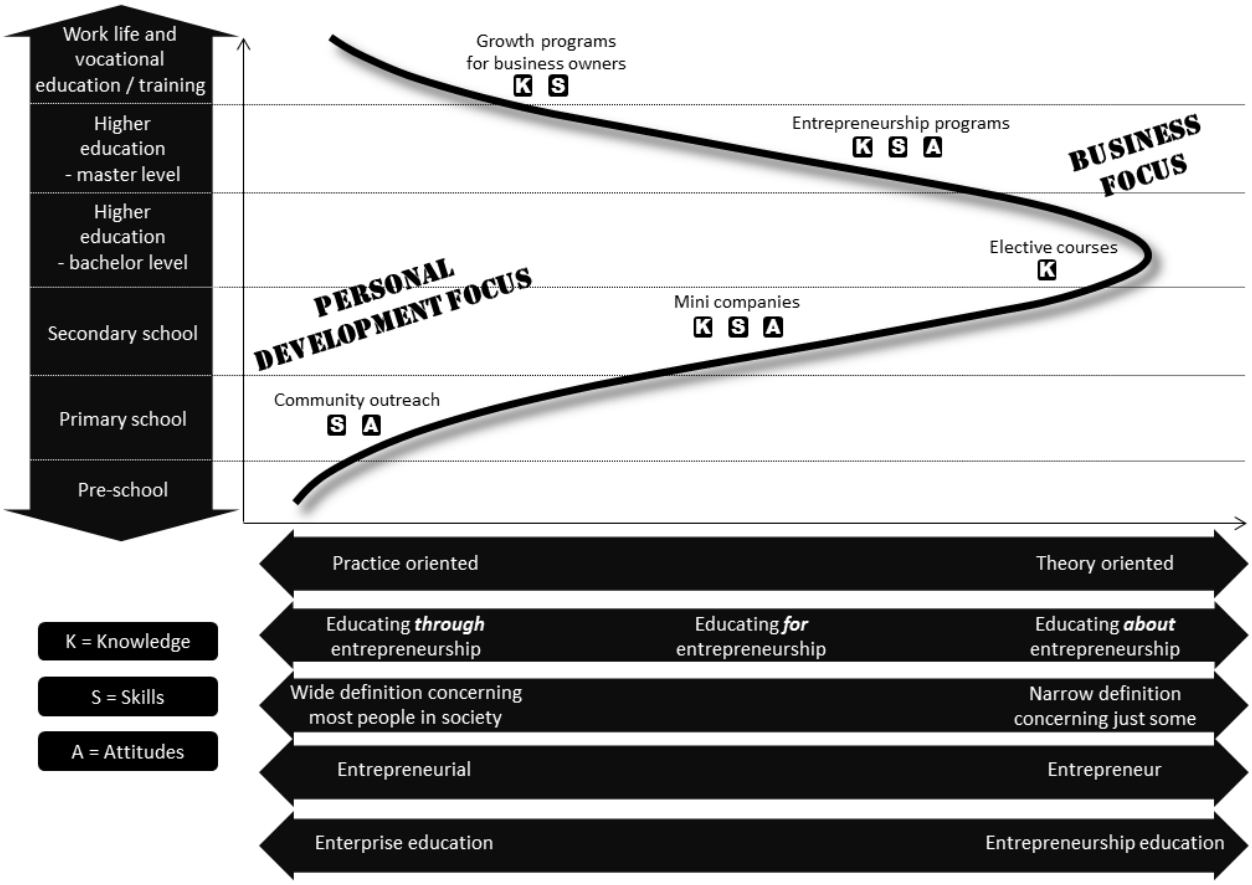

Figure 1. Overview of terms and definitions currently used in entrepreneurial education. *Some examples illustrate the current progression over time in the educational system, with shifting definition, pedagogical approaches and varying emphasis on theory over practice. The current lack of practice orientation on higher education levels lamented by many researchers is illustrated in the figure.*

10. In Northern and Eastern Europe some additional terms are used. In Sweden and the Balkans the term *entrepreneurial learning* is often used as an equivalent to enterprise education (See for example Leffler and Falk-Lundqvist, 2013, Heder et al., 2011). This sometimes causes confusion, since it is the same term used in the research domain of entrepreneurial learning, which is about studying how entrepreneurs learn outside of the educational domain. Another set of terms used in Finland is *internal entrepreneurship education* and *external entrepreneurship education* (See for example Seikkula-Leino et al., 2010). Internal entrepreneurship education is a synonym to enterprise education, and external entrepreneurship education is a synonym to entrepreneurship education. Adding to the confusion here is the fact that internal entrepreneurship is sometimes used as a synonym to intrapreneurship, i.e. when acting entrepreneurially in an established organization (See for example Burgelman, 1983).

1.2 Wide and narrow views on entrepreneurship

11. Being entrepreneurial can mean many things to many people. A common conception according to Gartner (1990) is that entrepreneurship is about entrepreneurial individuals creating innovative organizations that grow and create value, either for the purpose of profit or not. But entrepreneurship does not have to include the creation of new organizations, it can also occur in existing organizations (Shane and Venkataraman, 2007). It is not only limited to the entrepreneurial individual, but also to entrepreneurial opportunities and the relation between the individual and the opportunity, i.e. the individual-opportunity nexus as described by Shane (2003). Stevenson and Jarillo (1990) define entrepreneurship as "a process by which individuals - either on their own or inside organizations - pursue opportunities without regard to the resources they currently control" (p.23). Bruyat and Julien (2001) use a constructivist approach and propose a definition incorporating not only the entrepreneur, but also the new value created, the environment within which it takes place, the entrepreneurial process itself and the links between these constructs over time. They also propose the terms "individual" and "entrepreneur" to represent teams whenever applicable.

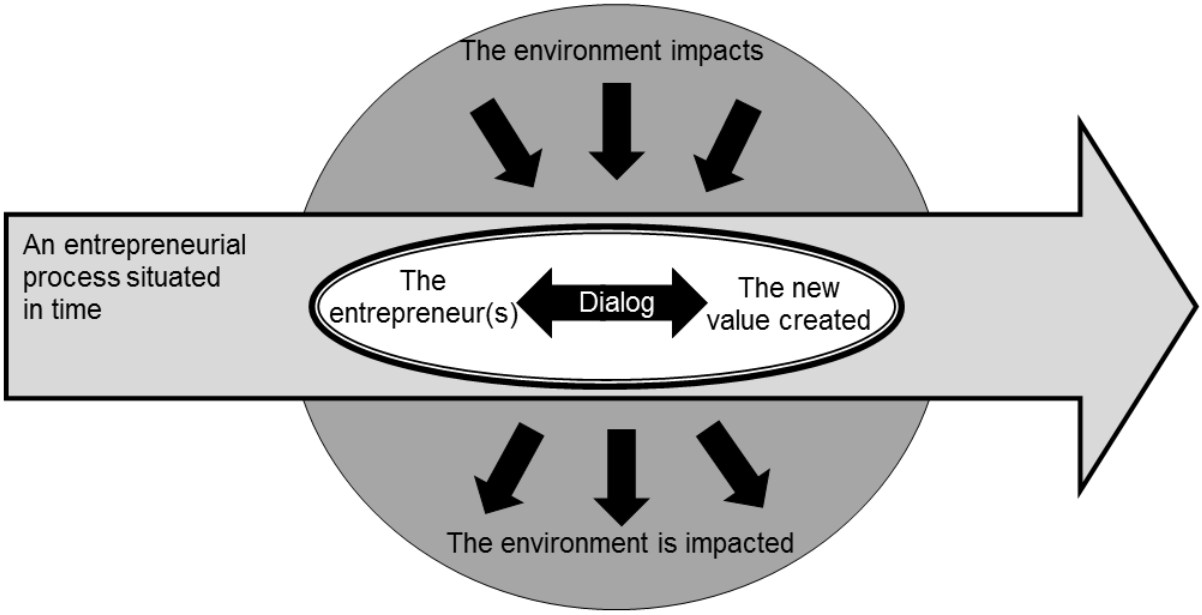

Figure 2. The entrepreneurial process locaed within its environment and time. *The dialog between the individual and the new value created is shown in the middle, and constitutes the core of entrepreneurship (adapted from Bruyat and Julien, 2001, p.170).*

12. In the educational domain the two terms enterprise and entrepreneurship education indicate that there are two quite differing views on what is meant by entrepreneurship, one termed "wide" and one termed "narrow", see figure 1. The risk for confusion and misunderstanding is significant, and any discussion on entrepreneurial education needs to start with clarifying which definition is used. According to the narrow definition of entrepreneurship it is about opportunity identification, business development, self-employment, venture creation and growth, i.e. becoming *an entrepreneur* (Fayolle and Gailly, 2008, QAA, 2012, Mahieu, 2006). According to the wide definition of entrepreneurship it is about personal development, creativity, self-reliance, initiative taking, action orientation, i.e. becoming *entrepreneurial*. What definition and approach is used profoundly affects educational objectives, target audiences, course content design, teaching methods and student assessment procedures, leading to a wide diversity of approaches (Mwasalwiba, 2010).

13. It is important to be aware of a common tendency in society to perceive entrepreneurs as predominantly male heroic individuals possessing special innate traits and preferring to work under adverse conditions in solitude (Hytti, 2005, Ogbor, 2000). Applying such a view of entrepreneurship in education is counter-productive and leads to alienation of (not only female) students (Leffler, 2012), neglect of the potential in collective team-based entrepreneurial endeavors (Drnovsek et al., 2009, Garud and Karnøe, 2003) and a damaging reproduction of outdated, gender-biased and oversimplistic images of entrepreneurship (Jones, 2012). An alternate view of entrepreneurship better suited to the educational domain is to view it as a generic method for human action, comprising of principles and techniques that anyone can learn through basic education (Sarasvathy and Venkataraman, 2011). Recent research has also shown that a majority of successful companies are started by teams rather than by sole entrepreneurs (Beckman, 2006, Klotz et al., 2014).

1.3 Educating about, for and through entrepreneurship

14. Entrepreneurial education is often categorized into three approaches, see figure 1 (Johnson, 1988, Heinonen and Hytti, 2010, O'Connor, 2013). Teaching "about" entrepreneurship means a content-laden and theoretical approach aiming to give a general understanding of the phenomenon. It is the most common approach in higher education institutions (Mwasalwiba, 2010). Teaching "for" entrepreneurship means an occupationally oriented approach aiming at giving budding entrepreneurs the requisite knowledge and skills. Teaching "through" means a process based and often experiential approach where students go through an actual entrepreneurial learning process (Kyrö, 2005). This approach often leans on the wider definition of entrepreneurship, and can be integrated into other subjects in general education, connecting entrepreneurial characteristics, processes and experiences to the core subject. While the "about" and "for" approaches are relevant primarily to a subset of students on secondary and higher levels of education, the embedded approach of teaching "through" entrepreneurship can be relevant to all students and on all levels of education (See for example Smith et al., 2006, Handscombe et al., 2008). Some important challenges have however been identified when trying to embed entrepreneurship into education this way, such as resource and time constraints, resistance from teachers, assessment challenges and cost implications (Smith et al., 2006), see further in chapter 4 below.

1.4 Value creation as the common core of entrepreneurial education

15. The varying definitions of entrepreneurship and resulting variations in pedagogical approaches have made it difficult to give teachers firm advice on how to approach entrepreneurial education (Fayolle and Gailly, 2008). If a useful definition could be agreed upon, the field and the teachers could benefit significantly. For the purpose of this report, Bruyat and Julien's (2001) definition grounded in the concept of *value creation* is outlined more in detail below and constitutes the basis of many of the resulting recommendations in this report. This does not mean that it is the only suitable definition, merely that the author of this report has judged it to be particularly useful for entrepreneurial education.

16. Bruyat and Julien (2001) state that studying the entrepreneur (or team) in isolation is inherently wrong, as it is not solely from the entrepreneur that entrepreneurship occurs. Entrepreneurship is as much about the change and learning that the individual entrepreneur experiences by interacting with the environment as the change and value creation the entrepreneur causes through his/her actions. Learning and value creation are thus seen as two main aspects of entrepreneurship. This view aligns better with the learning focused aims of educational institutions than many other definitions of entrepreneurship. It forms the basis of a resulting definition of entrepreneurial education leaning on value creation as a main goal for students. Letting students try to create value to outside stakeholders will then result in development of entrepreneurial competencies,

regardless of whether successful value creation is being achieved or not. Alluding to famous educational philosopher John Dewey's notion of "Learning-by-doing" the author of this report has proposed to label this a "Learning-by-creating-value" approach grounded in the field of entrepreneurship (Lackéus et al., 2013). According to this definition of entrepreneurial education, if a pedagogical intervention lets students learn to create value for other people (own group and teachers excluded), it is indeed entrepreneurial education. It could be done by actual value creation for other people as formal part of the curriculum (a preferred teaching "through" approach), or by learning about how to create value to other people (a less effective teaching "about" approach).

17. A definition of entrepreneurial education in line with this has been proposed by Danish Foundation for Entrepreneurship (Moberg et al., 2012, p.14): "Content, methods and activities supporting the creation of knowledge, competencies and experiences that make it possible for students to initiate and participate in entrepreneurial value creating processes". This definition of entrepreneurial education leans on the following underlying definition of entrepreneurship: "Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social." (p.14).

18. Implicit in these definitions is the notion of *entrepreneurial* value creation, i.e. that the value created should be novel, but also that it requires some kind of initiative on behalf of the value creator, that it involves acquisition of resources needed to create the value, that the value creation process is managed and owned by the initiator of the process (i.e. the student) and that this initiator also assumes the risk of failure (Shapero and Sokol, 1982, Okpara and Halkias, 2011). Value creation occurs extensively in society, and is tightly connected to people's happiness since helping others results not only in making a living but also in feelings of meaningfulness, participation, engagement and life satisfaction (Baumeister et al., 2012). Value creation is however seldom entrepreneurial, see Table 1. Two main categories of value creation are routine value creation and explorative value creation (O'Reilly and Tushman, 2013), see figure 3. Routine value creation is based on operational competencies such as process management and execution, optimization and incremental improvements. Explorative value creation is based on entrepreneurial competencies, see further in next section. Finding a balance between these two forms of value creation is important for society but difficult to achieve. Routine value creation is often emphasized due to its greater certainty of short-term success. As a solution to the resulting lack of explorative value creation, researchers have advocated separating structures between routine value creation and explorative value creation, i.e. forming ambidextrous organizations (O'Reilly and Tushman, 2004).

Table 1. Value creation examples. *How different stakeholders in society are creating value for others*

Stakeholder	**Creates value for**	**How value for others is created**	**F/S/C type**	**R/E type**
Established business	Customers, employees and shareholders	By offering commercial services and products	Financial value	Routine
Business entrepreneur	Customers, employees and shareholders	By offering novel commercial services and products	Financial value	Explorative
Social entrepreneur	Society and individuals in need	By offering novel social services and products	Financial, social and cultural value	Explorative
Welfare state	Citizens of the state	By offering welfare services	Financial, social and cultural value	Routine
Family member	Other family members	By always being there	Social value	Routine
Pet	Other family members	By always being there	Social value	Routine
Artist	Other individuals	By entertaining, provoking and triggering new thoughts	Cultural value	Routine / explorative
Student	Future employers /	By preparing for work life; by	Financial, social	Routine

	family / society	becoming an educated citizen	and cultural value	
Teacher	Students	By facilitating student learning	Social / cultural value	Routine

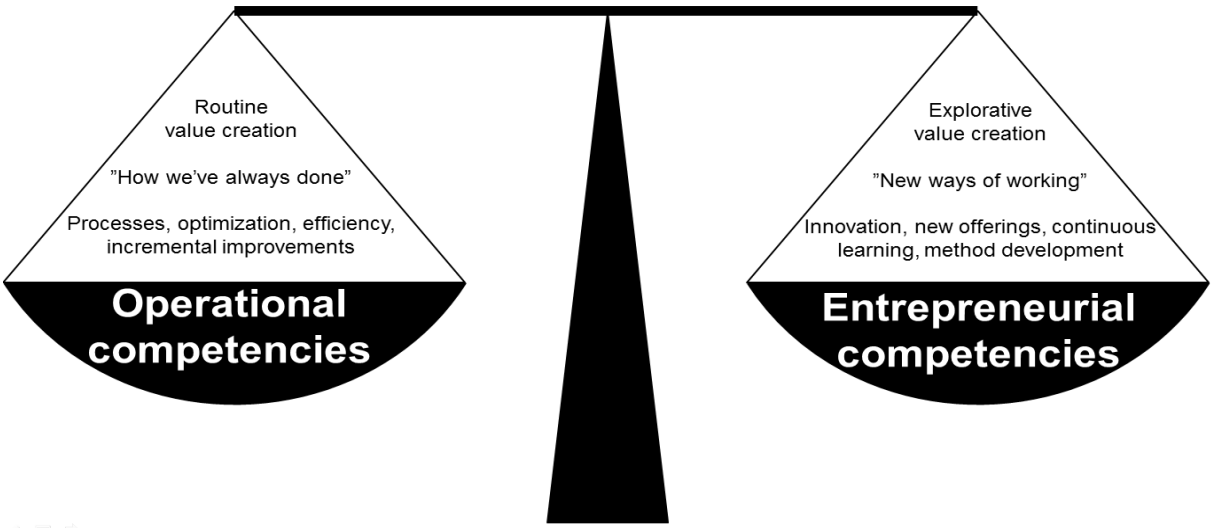

Figure 3. Two kinds of value creation. *Routine value creation is based on operational competencies such as process management and execution, optimization and incremental improvements. Explorative value creation is based on entrepreneurial competencies. A balance between them is desirable but seldom achieved.*

1.5 Entrepreneurial competencies

19. The main goal of most entrepreneurial education is to develop some level of *entrepreneurial competencies*. Table 2 contains a framework outlining some competencies often deemed to be entrepreneurial. Entrepreneurial competencies are defined here as knowledge, skills and attitudes that affect the willingness and ability to perform the entrepreneurial job of new value creation. This definition aligns with much of the literature on competencies in general as well as on entrepreneurial competencies (See for example Sánchez, 2011, Burgoyne, 1989, Kraiger et al., 1993, Fisher et al., 2008). The definition as well as the competencies in Table 2 can be viewed from a wide as well as a narrow perspective. Marketing skills can for example be necessary for a start-up in need to market its newly developed products, but also for a student wanting to get class-mates excited about an entrepreneurial project in order to get them to contribute to its development.

20. There are striking similarities between many of the outlined entrepreneurial competencies and what researchers label "non-cognitive factors", such as perseverance, self-efficacy, learning skills and social skills (Farrington et al., 2012). Table 2 outlines a continuum showing that the top rows represent cognitive competencies, i.e. primarily intellectual capacity based competencies, and the bottom rows represent typical non-cognitive competencies. Cognitive competencies are easy to teach and evaluate, whereas non-cognitive competencies require learning-by-doing and are more difficult to evaluate (Moberg, 2014a). The current educational policy climate emphasizing high-stakes standardized testing, international large-scale assessments and institutional ranking has led to a focus on cognitive competencies, neglecting non-cognitive competencies. This has led to a narrowing of the curriculum, teaching to the tests and a de-professionalisation of teachers (Hursh, 2007, Amrein and Berliner, 2002, Ball, 2003, Young and Muller, 2010). The risks with such a neglect of non-cognitive competencies is increasingly being acknowledged by researchers (Farrington et al., 2012, Morrison Gutman and Schoon, 2013, Levin, 2013), highlighting the strong research evidence that students' non-

cognitive competencies significantly impact academic performance and future labor market outcomes, perhaps even more than cognitive competencies (Moberg, 2014b). See figure 4 for five general categories of non-cognitive factors, and the reciprocal relationship between academic mindsets, perseverance, behaviors and performance.

Table 2. Entrepreneurial competencies. *Framework outlining some key entrepreneurial competencies and their relation to cognitive and non-cognitive competencies. Adapted from (Lackeus, 2014).*

	Main theme	Sub themes	Primary source	Interpretation used in this report
Cognitive competencies / Non-cognitive competencies	**Knowledge**	**Mental models**	(Kraiger et al., 1993)	Knowledge about how to get things done without resources, Risk and probability models.
		Declarative knowledge	(Kraiger et al., 1993)	Basics of entrepreneurship, value creation, idea generation, opportunities, accounting, finance, technology, marketing, risk, etc.
		Self-insight	(Kraiger et al., 1993)	Knowledge of personal fit with being an entrepreneur / being entrepreneurial.
	Skills	**Marketing skills**	(Fisher et al., 2008)	Conducting market research, Assessing the marketplace, Marketing products and services, Persuasion, Getting people excited about your ideas, Dealing with customers, Communicating a vision.
		Resource skills	(Fisher et al., 2008)	Creating a business plan, Creating a financial plan, Obtaining financing, Securing access to resources
		Opportunity skills	(Fisher et al., 2008)	Recognizing and acting on business opportunities and other kinds of opportunities, Product / service / concept development skills
		Interpersonal skills	(Fisher et al., 2008)	Leadership, Motivating others, Managing people, Listening, Resolving conflict, Socializing
		Learning skills	(Fisher et al., 2008)	Active learning, Adapting to new situations, coping with uncertainty
		Strategic skills	(Fisher et al., 2008)	Setting priorities (goal setting) and focusing on goals, Defining a vision, Developing a strategy, Identifying strategic partners
	Attitudes	**Entrepreneurial passion**	(Fisher et al., 2008)	”I want”. Need for achievement.
		Self-efficacy	(Fisher et al., 2008)	”I can”. Belief in one’s ability to perform certain tasks successfully.
		Entrepreneurial identity	(Krueger, 2005, Krueger, 2007)	”I am / I value”. Deep beliefs, Role identity, Values.
		Proactiveness	(Sánchez, 2011, Murnieks, 2007)	”I do”. Action-oriented, Initiator, Proactive.
		Uncertainty / ambiguity tolerance	(Sánchez, 2011, Murnieks, 2007)	”I dare”. Comfortable with uncertainty and ambiguity, Adaptable, Open to surprises.
		Innovativeness	(Krueger, 2005, Murnieks, 2007)	”I create”. Novel thoughts / actions, Unpredictable, Radical change, Innovative, Visionary, Creative, Rule breaker.
		Perseverance	(Markman et al., 2005, Cotton, 1991)	”I overcome”. Ability to overcome adverse circumstances.

21. While there is almost no research done on the interaction between non-cognitive factors and entrepreneurial education (For some exceptions, see Moberg, 2014b, Rosendahl Huber et al., 2012), this is a promising area where entrepreneurial education can aid the improvement of general education

through its innate capacity to foster the development of non-cognitive competencies leading to increased academic performance.

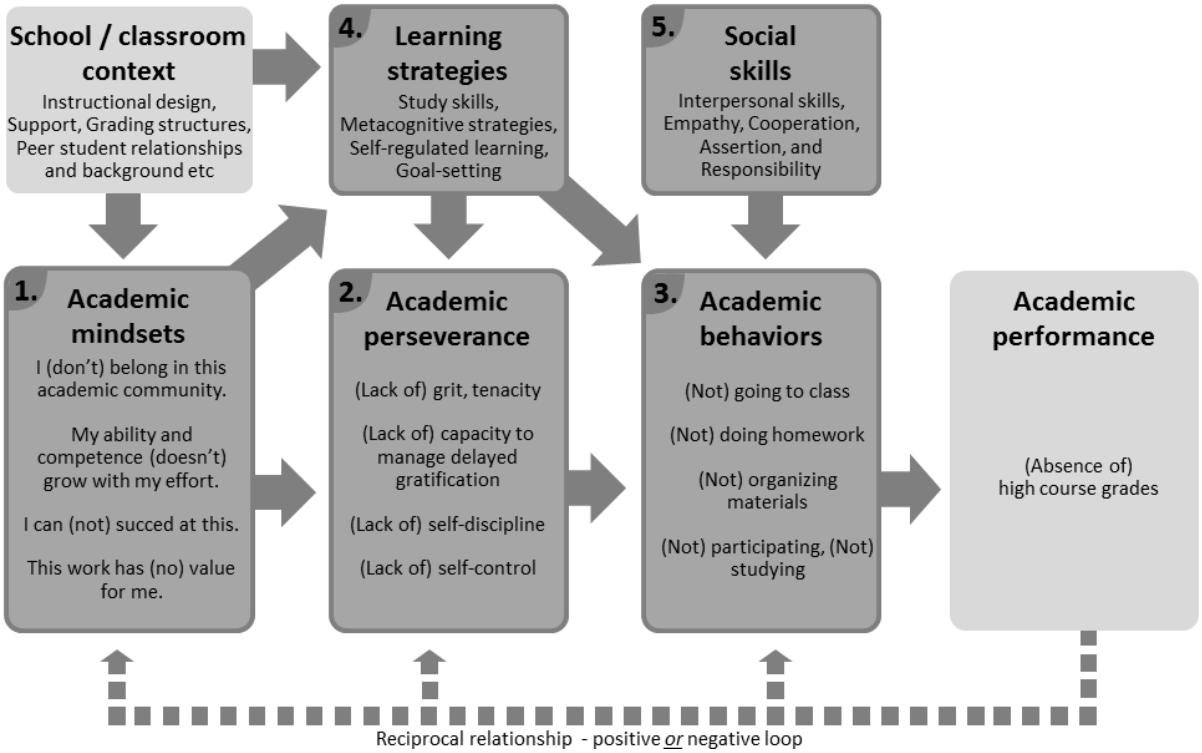

Figure 4. Non-cognitive factors. *Five categories of non-cognitive factors impacting academic performance. (Adapted from Farrington et al., 2012)*

1.6 The debates around entrepreneurial education

22. Much discussion around entrepreneurial education contrasts between a "traditional" and an "entrepreneurial" way of teaching. A common way to illustrate the differences is by showing a table with two columns contrasting the two modes of teaching, advocating for a paradigmatic change from traditional to entrepreneurial teaching (see for example Gibb, 1993, Johnson, 1988, Ollila and Williams-Middleton, 2011, Cotton, 1991, Kyrö, 2005, Kirby, 2004). Standardized, content focused, passive and single-subject based curriculum in traditional education is contrasted with an individualized, active, process-based, project centric, collaborative, experiential and multidisciplinary approach in entrepreneurial education. Most of this discussion is however being held without reference to the century-long debate between traditional and progressive education (Labaree, 2005, Cuban, 1990, Cuban, 2007), and the corresponding debate in philosophy between positivism and interpretivism, see figure 5. A few researchers have pointed out the striking similarities between entrepreneurial education and constructivist education (Löbler, 2006), but general awareness is very low. Other pedagogical approaches and movements with similarities to entrepreneurial education are experiential learning (Kolb, 1984), situated learning (Lave and Wenger, 1991), service-learning (Meyers, 1999), problem / project-based learning (Helle et al., 2006), adult learning (Jarvis, 2006), cognitive apprenticeship (Collins, 2006) and social constructivist learning (Steffe and Gale, 1995).

23. In this battle between competing positions, traditional education has remained the predominant approach in practice since more than a century. A main reason for this dominance according to Labaree (2005) is that in the end utility won over romanticism, with a message more

appealing to people in power and with far more convincing quantitative test results proving the behaviorist approach originally proposed by Edward Thorndike, placing the philosophical father of entrepreneurial education John Dewey (according to Pepin, 2012) on the losing side and regarded as too eclectic (Kyrö, 2005). Today traditional education shows no sign of weakening in the current education policy climate focusing on measurement and performativity (Ball, 2003, Apple, 2000, Biesta, 2009). Recent political pressure to increase emphasis on entrepreneurship in education has actually rather resulted in a value clash where teachers are reacting negatively on contradicting goals (Falk-Lundqvist et al., 2011).

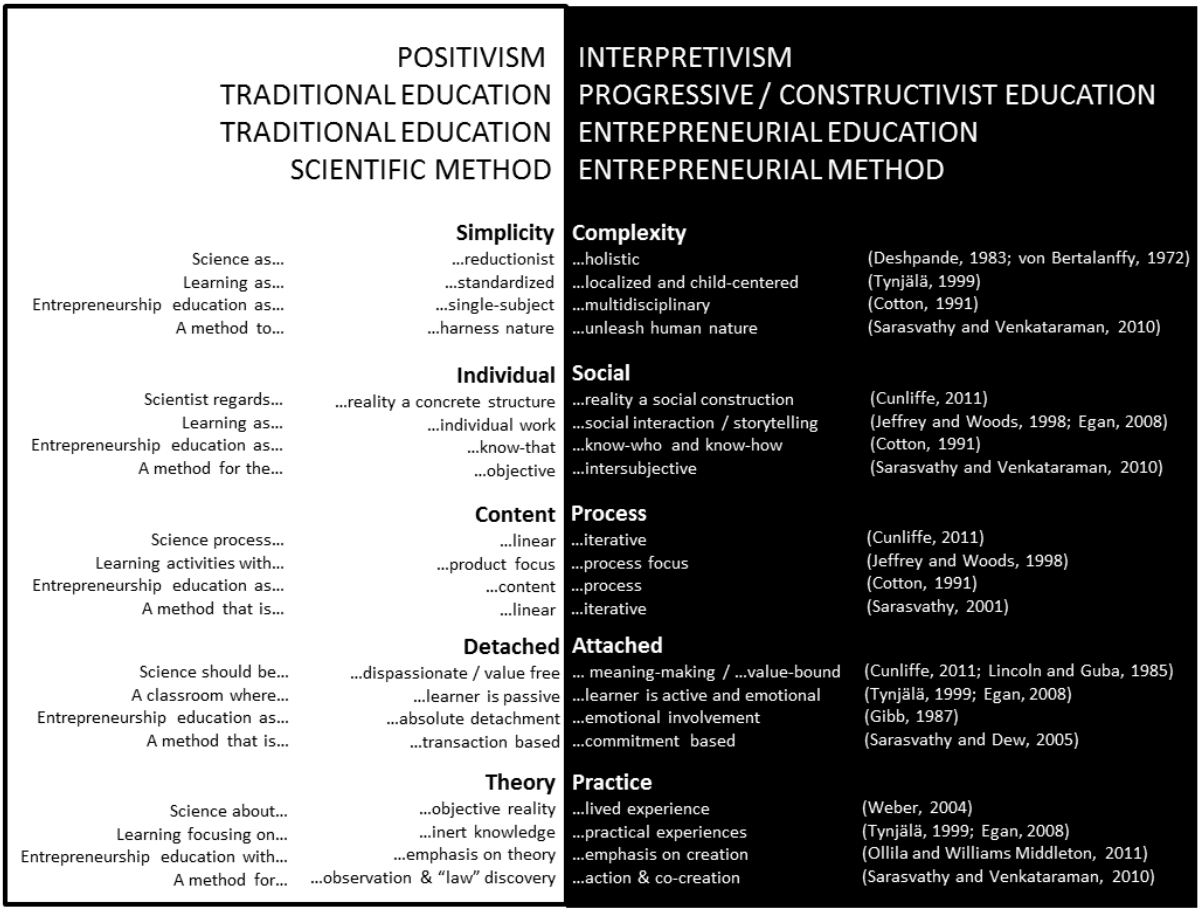

Figure 5. Dualistic debates on multiple levels. *Entrepreneurial education as embedded in debates in philosophy, education and entrepreneurship (Lackéus et al., 2013).*

1.7 Comparing entrepreneurial education to other pedagogical approaches

24. Some common pedagogical approaches often claimed to be similar to or appropriate in entrepreneurial education are problem-based learning (Tan and Ng, 2006), project-based learning (Jones and English, 2004) and service-learning (Desplaces et al., 2009). Although these approaches suffer from similar problems with multiple definitions as entrepreneurial education, table 3 shows an attempt to illustrate some key similarities and differences. Project-based learning has been defined as letting students work on a preferably authentic problem and create an "artifact" addressing the problem, i.e. a final product such as a report, a model, a video etc. (Blumenfeld et al., 1991). Problem-based learning also starts with a preferably authentic problem, but does not end with the production of an artifact addressing the problem, but instead with discussing possible solutions and guiding students' further study (Helle et al., 2006). Service-learning has been defined as classroom instruction integrated

with community service such as cleaning parks, visiting elderly and providing food to people in need (Spring et al., 2008). According to Spring et al. (2006) service-learning works best when students participate in the planning of the project, when the duration is one semester or longer, and when student reflection is explicitly facilitated.

25. Table 3 also illustrates some unique features of entrepreneurial education, such as emphasis on not only problems but also on opportunities (Rae, 2007), iterative experimentation in collaboration with external stakeholders (Sarasvathy and Venkataraman, 2011) and focus on (or even requirement of) newness or innovativeness of created artifacts / value (Shapero and Sokol, 1982). Some features of entrepreneurial education are also rare in the other pedagogical approaches contrasted here, such as focus on value creation to external stakeholders (Bruyat and Julien, 2001), interaction with the outside world (Fayolle and Gailly, 2008), and artifact creation (Lackéus, 2013). These rare or unique features explain to a large extent why entrepreneurial education can trigger much higher levels of motivation, experienced relevancy, engagement and deep learning than can other pedagogical approaches (Lackéus, 2013).

Table 3. Comparison of pedagogical approaches. *Similarities and differences between entrepreneurial education and some pedagogical approaches often stated to be similar.*

Major focus on…	Entrepreneurial education	Problem-based learning	Project-based learning	Service-learning
…problems	X	X	X	X
…opportunities	X			
…authenticity	X	X	X	X
…artifact creation	X		X	
…iterative experimentation	X			
…real world (inter-)action	X			X
…value creation to external stakeholders	X			X
…team-work	X	X	X	
…work across extended periods of time	X		X	X
…newness / innovativeness	X			
…risk of failure	X			

1.8 Future answers to the question "What is entrepreneurship in education?"

26. In the future we can hope for less confusion in terminology used, higher awareness of the existence of a wide definition of entrepreneurship and increased definitional clarity and agreement among researchers and practitioners. It is desirable that the domains of entrepreneurship and education increase their collaboration with each other in the future, both within research and practice. Neither of the domains will likely progress our knowledge of entrepreneurial education theory and practice without the other's help and committed collaboration.

27. We can also hope for increased acknowledgement in society that there is a problematic deficit of new and innovative value creation activity and that equipping all citizens with increased entrepreneurial competencies through entrepreneurial education is a viable strategy for alleviating this problem. For this to succeed it will probably help if entrepreneurial education is perceived as an effective and easy-to-use pedagogical approach alongside other progressive pedagogies such as problem/project-based learning, service-learning and others. Infusing value creation experiences across the entire curriculum can be one of the most important contributions entrepreneurship can make to education in the future.

28. It will however require substantial work both from researchers and practitioners. If entrepreneurial education is to advance beyond the currently marginalized position of innovative

pedagogy and separate minor subject status, much more is needed than calls for paradigmatic change in education. Assessment strategies need to be outlined that can be put to use by teachers in daily practice, allowing for detached and individual assessment of an inherently collective, social and emotional learning process. Ways to manage and reduce the complexity (see figure 5) that entrepreneurial education can result in need to be outlined. Strategies for embedding creative learning-by-doing into content and theory laden curricula need to be developed. If future work in the field of entrepreneurial education can succeed with these and other related challenges, the common answer to "What is entrepreneurship in education?" will perhaps be very different from today's usual (lack of) answers and widespread confusion.

2. WHY IS ENTREPRENEURIAL EDUCATION RELEVANT?

29. Entrepreneurial education has seen worldwide exponential growth in higher education institutions (Kuratko, 2005), and was in 2001 offered at around 1200 business schools only in United States (Katz, 2008). On other levels of education such strong growth has not yet been seen, but development is under way with policy pressure exerted on educational institutions worldwide (see for example Ohe, 2012, Li et al., 2003, Farstad, 2002, Mwasalwiba et al., 2012). Today entrepreneurial education has become an important part of both industrial and educational policy in many countries (Hytti and O'Gorman, 2004). This chapter will first discuss the *stated* reasons for this focus on entrepreneurial education, and then outline some of the attempts that have been made to provide empirical evidence for some of the stated effects, indeed a challenging endeavor so far. Finally a way forward will be outlined taking into account the need to widen the definition of entrepreneurship used in assessment attempts in order to cater for other levels of education than higher education, and to provide evidence for other effects than purely business related.

2.1 Stated effects of entrepreneurial education

30. The most common reason that researchers and experts promote entrepreneurial education is that entrepreneurship is seen as a major engine for economic growth and job creation (Wong et al., 2005). Entrepreneurial education is also frequently seen as a response to the increasingly globalized, uncertain and complex world we live in, requiring all people and organizations in society to be increasingly equipped with entrepreneurial competencies (Gibb, 2002). Besides the common economic development and job creation related reasons to promote entrepreneurial education, there is also a less common but increasing emphasis on the effects entrepreneurial activities can have on students' as well as employees' perceived relevancy, engagement and motivation in both education (Surlemont, 2007) and in work life (Amabile and Kramer, 2011). Finally, the role entrepreneurship can play in taking on important societal challenges (Rae, 2010) has positioned entrepreneurial education as a means to empowering people and organizations to create social value for the public good (Volkmann et al., 2009, Austin et al., 2006). For an overview of areas where entrepreneurial education is stated to have an impact, see table 4.

31. The strong emphasis on economic success and job creation has indeed propelled entrepreneurial education to a prominent position on higher education level, but not as an integrated pedagogical approach for all students on all levels. So far primary focus has been on elective courses and programs for a few secondary education and university students already possessing some degree

of entrepreneurial passion and thus self-selecting into entrepreneurial education (Mwasalwiba, 2010). The emphasis on economic effects has so far hampered a widespread adoption of entrepreneurial education in the remaining parts of the educational system. Instead it is often viewed as a "dark threat" by teachers, stating that the "ugly face of capitalism" is now entering educational institutions (Johannisson, 2010, p.92). The stated necessity of all people to become more entrepreneurial due to globalization and increasing uncertainty on the market has spurred significant activity on policy level, but has not yet transferred into wide adoption among teachers on all levels of education.

32. A more viable starting point in education could be to perceive entrepreneurial education as a means to achieve more interest, joy, engagement and creativity among students (Johannisson, 2010, Lackéus, 2013). A few scholars have recently put forward the potential of entrepreneurial education to spur increased perceived relevancy of subjects taught among learners, increasing motivation and school engagement and alleviating problems of student boredom and dropout (Deuchar, 2007, Surlemont, 2007, Mahieu, 2006, Nakkula et al., 2004, Moberg, 2014a). This is however a very unusual approach so far in practice.

33. The booming student interest in social entrepreneurship (Tracey and Phillips, 2007) is another unusual but promising starting point for entrepreneurial education. Interest among young people to engage in solving societal challenges is high around the world (Youniss et al., 2002). Here entrepreneurship can be positioned as a tool for young people to attempt to act as societal history-makers (Spinosa et al., 1999). If such an interest can be mobilized as part of curriculum, it can propel deep learning and put theoretical knowledge to practical work in meaningful ways for students. Corporations can also be asked to participate with their financial resources in such endeavors.

Table 4. Overview of why entrepreneurial education is stated to be relevant and important. *Job creation, economic success, globalization, innovation and renewal are common but not so effective on a wider scale. Joy, engagement, creativity and societal challenges are less common but promising.*

	Individual level	**Organizational level**	**Societal level**	**References**
Commonly stated reasons for entrepreneurial education, but less effective in schools and for embedded approaches				
Job creation	More individuals are needed that are willing and capable to create job growth	Growing organizations create more jobs	Entrepreneurship and innovation are primary paths to growth and job creation	(Jones and Iredale, 2010, Hindle, 2007, Kuratko, 2005, Volkmann et al., 2009)
Economic success	Entrepreneurship can give individuals economic success	Organizational renewal is fundamental to every firm's long-term success	Renewal processes are fundamental to the vitality of economies	(Kuratko, 2005, O'Connor, 2008, Volkmann et al., 2009, Gorman et al., 1997)
Globalization, innovation and renewal	People need entrepreneurial skills and abilities to thrive in an ever-changing world	Entrepreneurial firms play a crucial role in changing market structures	A deregulated and flexible market requires people with higher-level general skills	(Henry et al., 2005, Jones and Iredale, 2010, Kuratko, 2005, Hytti and O'Gorman, 2004)
Rarely stated reasons for entrepreneurial education, but promising for schools and embedded approaches				
Joy, engagement, creativity	Creation / value creation / creativity is a main source of joy and pride for people	Employee creativity and joy is essential for the performance of new and existing organizations	Economic wealth of nations correlates with happiness of its citizens	(Amabile and Khaire, 2008, Amabile and Kramer, 2011, Goss, 2005, Diener and Suh, 2003)
Societal challenges	People can make a difference to society, and marginalized people can achieve economic success	Corporations can collaborate with small social entrepreneurship initiatives to create social value	Social entrepreneurship addresses problems in society that the market economy has failed to address	(Volkmann et al., 2009, Kuratko, 2005, Seelos and Mair, 2005, Austin et al., 2006, Rae, 2010)

2.2 Evidenced effects of entrepreneurial education

34. Research on the effects of entrepreneurial education has primarily leaned on a narrow definition of entrepreneurship. The commonly desired outcome of an educational intervention is that the students sooner or later end up creating new companies that are growing and creating jobs. This is in line with the previously described focus on the economic benefits of entrepreneurial education. Almost no research has been conducted using a wider definition of entrepreneurship, or the potentially resulting student engagement and societal value creation (for some exceptions, see Moberg, 2014a, Nakkula et al., 2004).

35. Most studies on the effects of entrepreneurial education lean on the assumption that becoming an entrepreneur is a consciously planned behavior. A linkage between attitudes, intentions and behavior is used, based on the "Theory of Planned Behavior" (TPB) taken from the domain of psychology (Ajzen, 1991, Bandura, 1997, Krueger et al., 2000), see figure 6. If people's attitudes towards entrepreneurship are positively influenced by entrepreneurial education, their entrepreneurial intentions will also change, and it will subsequently lead to the so desired entrepreneurial behavior. Using this assumed linkage, researchers have administered surveys that try to capture the perceived entrepreneurial attitudes and intentions of students before and after an educational intervention. If the attitudes and/or intentions have changed in positive ways afterwards, it is deemed to be a successful entrepreneurial education. There are however numerous problems with this approach. It leans on a research method taken from natural sciences where the effects in a treatment group are compared to the effects in a control group not getting treatment. The strict circumstances needed to be fulfilled for this method to work are however almost never met in the domain of entrepreneurial education due to practical challenges, so the results need to be interpreted with significant precaution (Martin et al., 2013). The results themselves are also quite inconclusive (Lautenschläger and Haase, 2011), something which neither confirms nor refutes the utility of entrepreneurial education. Another challenge is the stipulated linearity of entrepreneurial thought and action (Krueger, 2009). In reality,

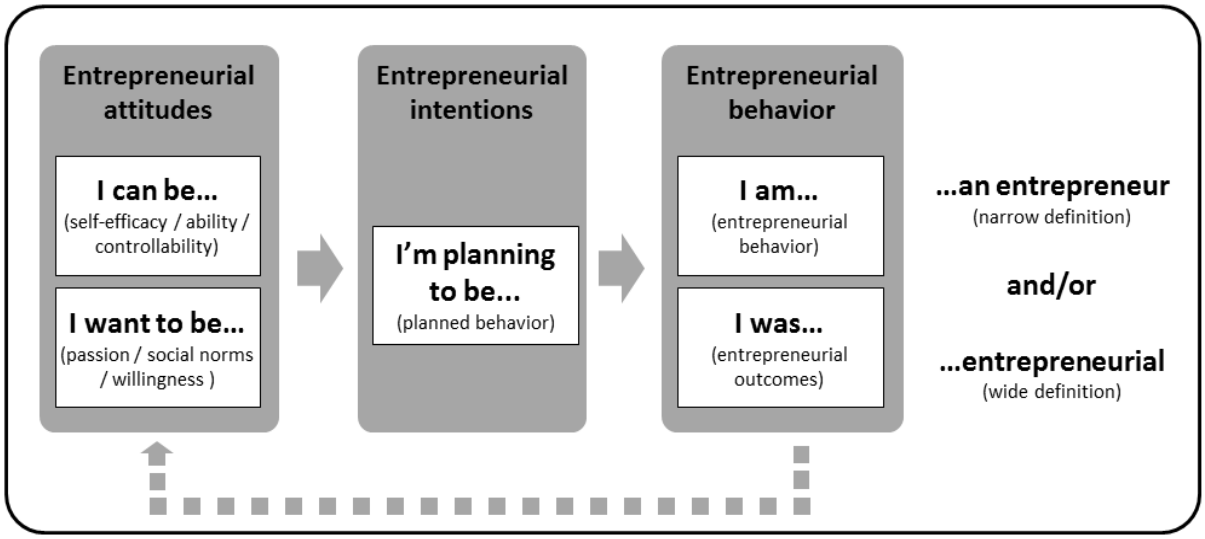

Figure 6. The theory of planned behavior (TPB). *Entrepreneurial attitudes impact people's entrepreneurial intentions, which in turn spurs entrepreneurial behavior. The dotted arrow illustrates the iterative nature of entrepreneurship which is not taken into account by impact studies leaning on the theory of planned behavior.*

entrepreneurial processes are seldom linear (Sarasvathy and Dew, 2005), they are rather iterative which means that attitudes, intentions and behavior are dynamically interrelated, see dotted arrow in figure 6. This poses additional challenges to assessing the effects of entrepreneurial education. This said, there are undeniable similarities between Figure 6 and Figure 4, implying that the same quantitative methods used to assess entrepreneurial education could be used for assessing the development of non-cognitive competencies, perhaps with more useful results.

36. Another common strategy for assessing effects of entrepreneurial education is to capture actual entrepreneurial behavior as it occurs years after the educational intervention. The difficulty here is to prove that it was entrepreneurial education that caused the successful entrepreneurial behavior. Venture creation takes many years to reach success, making it difficult to isolate the role of entrepreneurial education (Fayolle et al., 2006). Self-selection bias aggravates this problem, making it difficult to rule out the possibility that already entrepreneurial people are attracted to entrepreneurial education, causing these higher levels of entrepreneurial activity (Bager, 2011). What is clear from behavioral research on assessment is however that entrepreneurship education graduates have a higher frequency of acting entrepreneurially (Kolvereid and Moen, 1997, Menzies and Paradi, 2002, Charney and Libecap, 2000). And regardless of if these students would have acted entrepreneurially or not without educational treatment, it is difficult to deny the benefit of these practicing entrepreneurial individuals having received some degree of preparedness through entrepreneurial education. In most other professions it is generally accepted and unquestioned that education is provided for future practitioners such as doctors, engineers, lawyers and others (Hindle, 2007).

37. Neither of the two main assessment strategies described above contribute more than marginally to illuminating the question of *how*, *when* and *why* students develop entrepreneurial competencies. The unfortunate situation when it comes to reliable evidence for the effectiveness of entrepreneurial education is that there is not much of the quantitative kind. Most of the affirmative quantitative evidence that has been put forward is methodologically flawed due to inherent challenges in the field (for some rare exceptions see Oosterbeek et al., 2008, Mentoor and Friedrich, 2007). There is however increasing qualitative evidence of effective practices (see for example Pittaway and Cope, 2007, Neck and Greene, 2011, Barr et al., 2009, Surlemont, 2007, Mueller, 2012). Perhaps we need to accept that the currently used methods for assessing the impact of entrepreneurial education need to be developed and refined further in order to deliver robust teacher recommendations and effectiveness evidence in line with widespread beliefs and convictions. One possible avenue is to use mixed methods, i.e. a mix of quantitative and qualitative methods.

2.3 Some novel ways to assess the development of entrepreneurial competencies

38. Some qualitative methods for assessing entrepreneurial competencies have been put forward by Bird (1995), i.e. student diaries, student observation, critical event interviewing and think aloud protocols. The formerly neglected role of emotions in learning has also been highlighted by some entrepreneurial education scholars, suggesting that emotional and critical events have "a prominent role to play in how entrepreneurs learn" (Cope, 2003, p.434), and that "the affective construct actually rare in entrepreneurship research, should take a more explicit place in learning and teaching" (Kyrö, 2008, p.46). Dirkx (2001) states that emotions are key to attributing meaning to our learning experiences, thus making emotions a central part of entrepreneurial education and a plausible assessment path going forward.

39. These methods and perspectives have been applied in a study conducted by the author of this report, using emotional and critical learning events as a link between educational design and developed entrepreneurial competencies, capturing such events through students' own mobile smartphones using experience sampling methods (ESM, see Hektner et al., 2007), feeding them into

interviews with students and analyzing these interviews with text analysis software (Lackéus, 2013). This approach has yielded some insights into the "black box" of entrepreneurial learning in education, see figure 7, and opens up for increased understanding of how, when and why students develop entrepreneurial competencies. It also represents a novel strategy for assessing entrepreneurial competencies by assessing emotional activity during education rather than competencies obtained after education (Lackeus, 2014), which is similar to formative assessment strategies. Formative assessment has been defined as a teacher- or learner-directed feedback process that establishes where learners are in their learning, where they are going and what needs to be done to get them there (Black and Wiliam, 2009).

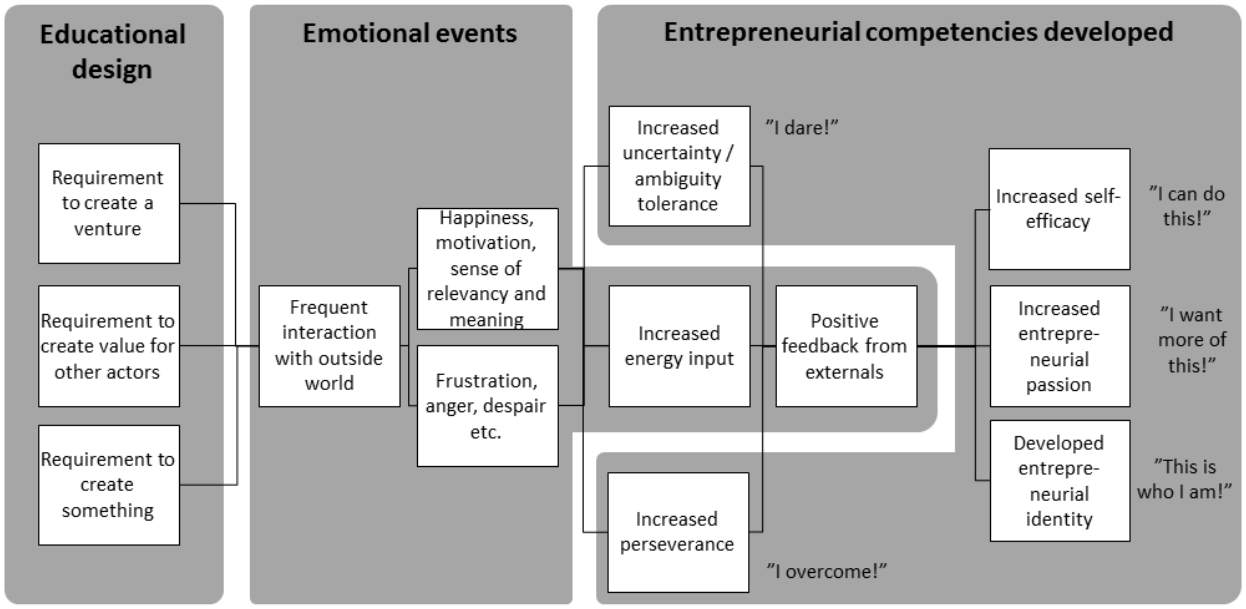

Figure 7. Early glimpse into the "black box" of entrepreneurial learning. *A conceptual example of how educational design triggers emotional events which in turn develop entrepreneurial competencies. (Lackeus, 2014).*

40. Another approach could be to lean on the numerous individual reports of "practical adequacy" of entrepreneurial education, rather than searching for an evasive "truth" on the effects of entrepreneurial education (cf. Sayer, 2010, p.69-70). This should however lean on learner perspectives rather than other stakeholders' views of what allegedly works, since it is difficult for others to reliably guess what learners experienced and appreciated at an educational intervention. Whenever there are enthusiastic learners asking for and enjoying high quality entrepreneurial education there is good reason to try to understand, generalize and expand the diffusion of methods and theories underlying such positive cases. Some caution is however required. Literature on entrepreneurial education is replete with single case studies outlining what one particular team of teachers did and how it worked for them, but without a deeper decontextualization, categorization or contrasting of learners' own experiences to other relevant educational environments within or outside the entrepreneurial domain.

41. Yet another approach could be to draw on neighboring domains where assessment issues are important, such as service-learning assessment (Steinke and Fitch, 2007, Furco and Root, 2010), problem / project based learning assessment (Helle et al., 2006, Vernon and Blake, 1993), non-cognitive factors assessment (Morrison Gutman and Schoon, 2013), formative assessment (Black and Wiliam, 2009) and other domains where a similar search for evidence is ongoing. To conclude, Table 5 summarizes some current and emerging assessment strategies in entrepreneurial education.

Table 5. Assessment in entrepreneurial education. *Current assessment focus in entrepreneurial education based on TPB, case studies and entrepreneurial outcomes, contrasted to a future complementing assessment focus proposed to be built on ESM (Adapted from Lackeus, 2014).*

Main focus of assessment strategy	Before education	During education	Immediately after education	Years / decades after education
Thoughts	TPB	ESM	TPB, Case studies	Case studies
Actions	-	ESM	-	Entrepreneurial outcomes
Emotions	-	ESM	-	-

2.4 Future answers to the question "Why is entrepreneurial education relevant?"

42. In the future we can hope for less discrepancy between stated effects of entrepreneurial education and those effects desired and appreciated by most teachers, as well as a corresponding shift in assessment research towards providing evidence for the effects teachers actually are interested in. We can also hope for a methodological development allowing researchers to better prove any effects of entrepreneurial education, from wide as well as narrow approaches to entrepreneurial education. This will probably entail more focus on qualitative and mixed research methods helping us to better understand how, when and why entrepreneurial education leads to desirable effects rather than merely if they lead to any stated effects or not. Promising avenues for such research are the role of emotions, links to non-cognitive competencies and the use of formative assessment strategies. Case studies and good (even "best") practice studies will probably continue to be produced, and we can hope for increased effort of such initiatives to decontextualize and contrast their experiences to other cases and to existing theory, generating more generalizable knowledge and perhaps even new theory. In the future we will hopefully also see more research and practice on primary and secondary levels of education studying and applying embedded approaches where entrepreneurship is integrated into existing curriculum. It could help balancing the current heavy focus on voluntary business based courses and programs in higher education, so that the future common answer to "Why is entrepreneurial education relevant?" will resonate better with all students and teachers on all levels of education than today.

3. WHEN TO DO WHAT?

43. Establishing a progression model has recently been proposed as a solution to the problems of differing definitions of entrepreneurship, differing intended learning outcomes and differing pedagogical approaches in the domain of entrepreneurial education (Gibb, 2008, Blenker et al., 2011, Rasmussen and Nybye, 2013, Mahieu, 2006). A progression model allows for gradual change of definitions applied and learning outcomes stipulated as learners progress in the educational system, and can support teachers in their daily work with embedding entrepreneurship into education. Such models are however rare since the main focus among researchers has been higher education initiatives and programs.

3.1 Four progression models from United Kingdom, Denmark and Sweden

44. Gibb (2008) proposes that in order for entrepreneurial education to be embedded into the education system, it should be "child centred in primary [education], subject centered in secondary [education], vocational centred in further education and discipline centred at university" (p. 122). Based on this, Gibb outlines an evaluation framework linking this progression model to eight allegedly testable learning outcomes for each of the four levels of education (p. 138-141). These learning outcomes consist of different variations on entrepreneurial competencies much in line with Table 2 above. Gibb provides some example exercises and evaluation methods that could inspire teachers, such as asking learners to "explain what the use of some particular piece of knowledge might be to whom and why" (p. 132-137).

45. A progression model proposed by Blenker et al (2011) leans on two central ideas. The first idea is that entrepreneurial activity can lead to many kinds of value, not only economic value. The second idea is the existence of a value-creating entrepreneurial mindset and generic methodology possible to apply to all walks of life which they label "entrepreneurship as everyday practice" (see also Blenker et al., 2012), an approach very similar to the wide definition of entrepreneurship. They conclude that such an entrepreneurial approach to life is a mandatory component of all entrepreneurial education, no matter if the desired outcome is venture creation, growth or social change. Based on this they propose four basic building blocks that can develop entrepreneurial attitudes among learners, and that constitute practical recommendations that teachers can draw on: 1) Letting students construct entrepreneurial stories anchored in their own life world helps them develop their opportunity skills. 2) Letting students reflect upon problems and disharmonies in their own life world helps them develop everyday value creation skills. 3) Letting students imagine themselves as entrepreneurial individuals in a distant future helps them transform into a more entrepreneurial identity. 4) Letting students work in interdisciplinary teams picturing and then realizing entrepreneurial opportunities helps them develop work forms for "team-efficacy" (Blenker et al., 2011, p.425).

46. Another progression model has been proposed by the Danish Foundation for Entrepreneurship – Young Enterprise (Rasmussen and Nybye, 2013). They state that there are four basic dimensions that always need to be taken into account by educators, regardless of educational level. Entrepreneurial education needs to be based on practical actions by learners where they work in teams creating value for others. It needs to allow for creativity where learners get to try out their own ideas, apply their acquired knowledge and find new solutions. It needs to be connected to the environment outside the school / university, interacting with and learning from society's cultures, markets and professional actors. Finally it also needs to relate to attitudinal aspects such as belief in own ability, ambiguity tolerance and risk of failure. These four basic dimensions are stated to be useful for teachers on all levels developing new educational content, new educational processes and new forms of assessments and exams.

47. The author of this report has proposed a progression model (Lackéus, 2013) that outlines four different types of action-based pedagogy, see Figure 8. According to this model, increasing complexity in the creation process could be introduced the higher up in the educational system you get. This can help teachers determine which class of activity to opt for in any given teaching situation depending on purpose, ability, resource access, interest and context. The further you get into the classification questionnaire (further down in Figure 8), the higher the potential student motivation and engagement, but unfortunately also the higher the teaching complexity. According to this classification, the common business plan focus in entrepreneurial education (Honig, 2004) is more in line with a creation approach than with a value creation or venture creation approach, since writing a business plan by itself does not create value to external stakeholders. Instead the business plan often becomes a deliverable to the teacher, and would not survive first contact with the assumed customers

(Jones and Penaluna, 2013). Project based learning is also an example of a creation approach since the artifacts are primarily used for teacher evaluation, not for creating value to outside stakeholders. Service-learning is a rare example of a value creation approach where value is created to the surrounding community.

48. The value creation approach is not so common in education today, but represents a promising compromise between student motivation and teacher complexity. Some new value creation tools that have emerged in the last decade include Effectuation (Read et al., 2011), Customer Development (Blank, 2005), Business Model Generation (Osterwalder, 2004), Lean Startup (Ries, 2010), Appreciative Inquiry (Bushe and Kassam, 2005) and Design Thinking (Johansson-Sköldberg et al., 2013). These tools will be outlined in next chapter of this report.

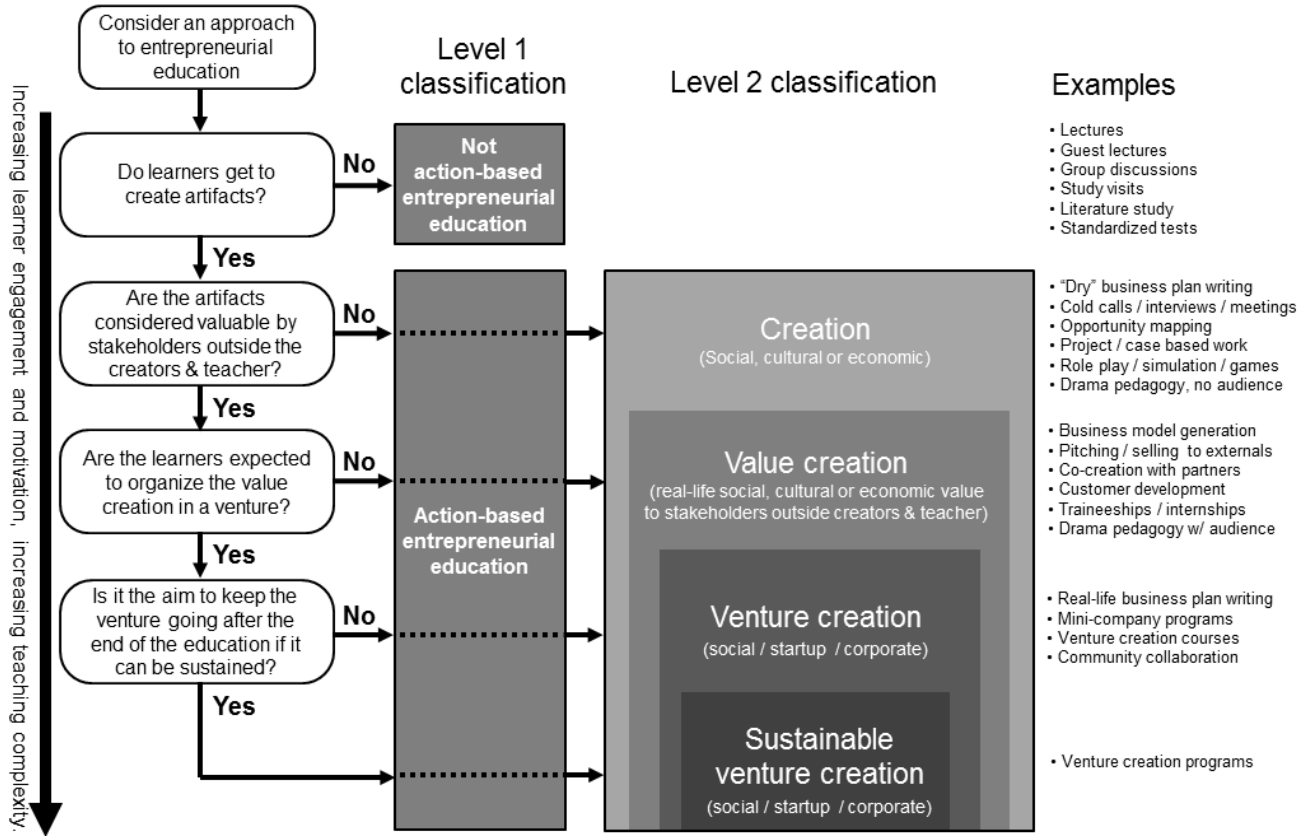

Figure 8. Classification of action-based entrepreneurial education. *Four types of action-based pedagogy, a question scheme and some examples of pedagogical approaches (Lackéus, 2013).*

3.2 Towards a unified progression model for entrepreneurial education

49. Based on the four above outlined progression models it is possible to construct a unified model incorporating many of the dimensions deemed to be central to achieving progression in entrepreneurial education, see figure 9. Some generic features have been highlighted by all of the authors of the four progression models, such as a team based approach, a focus on value creation, connecting the students to the outside world and letting students act on their knowledge and skills. This results in deep learning as well as development of entrepreneurial competencies, as outlined previously in this report.

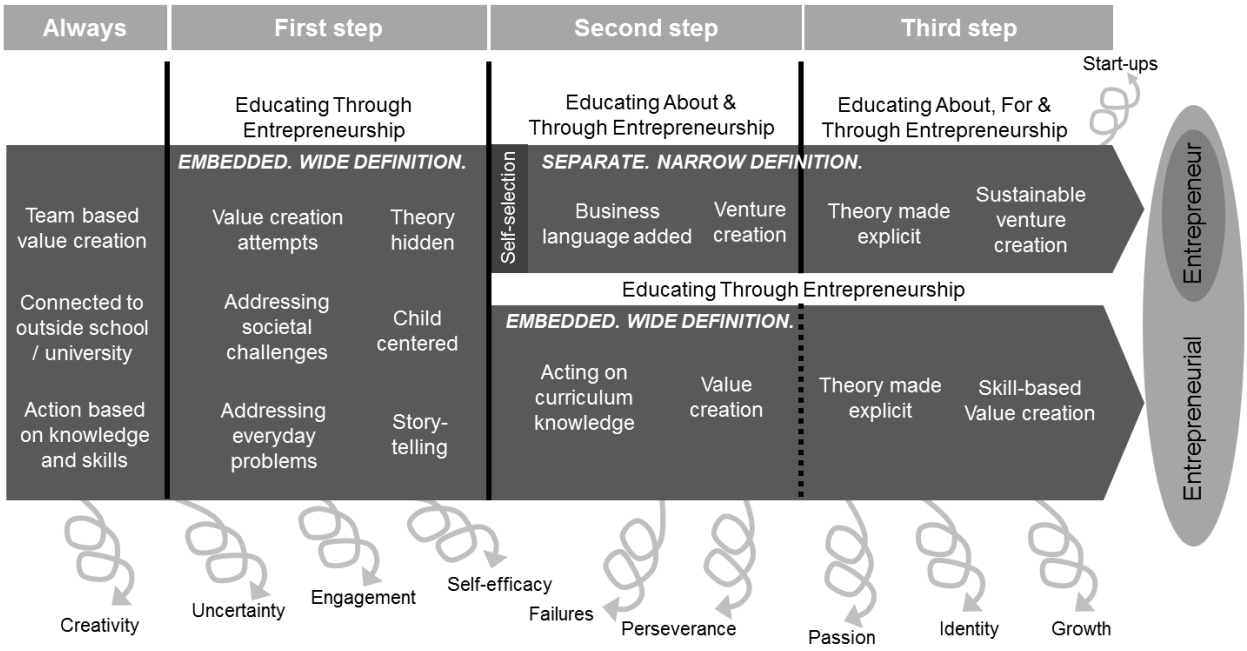

Figure 9. A unified progression model for entrepreneurial education. *Generic features always present and three steps constituting a progression.*

50. In the first step an embedded approach is recommended where learners get to take action by addressing societal challenges and everyday problems based on their own interest and ideas, integrated into the core subjects of school rather than treating entrepreneurship as a separate subject. This spurs creativity, engagement and self-efficacy, but also uncertainty and ambiguity which can be a negative experience initially (as shown in Lackéus, 2013). Here the students can be turned into teachers, telling their peer students about what they learned through the process. Such oral articulation of actions taken and resulting insights can facilitate the deep learning process significantly according to Russian psychologist Galperin (Haenen, 1996). The embedded approach leans on the wide definition of entrepreneurship.

51. In the second step of education such as secondary school (but not necessarily), a crossroad comes where most learners continue with the embedded approach but with more emphasis on acting on curriculum knowledge. Some learners make an active choice leading to a separate subject approach where business language and terms are added and the aim is narrowed into creating a venture, for example the very common Young Enterprise approach (Dwerryhouse, 2001). In the second step the stakes are raised and the risk for failure increases, allowing learners to develop perseverance and a constructive attitude towards failure. The separate subject approach leans on the narrow definition of entrepreneurship.

52. In the third step the embedded approach becomes more skill-based and underpinning entrepreneurship theory is made explicit allowing students to reflect on the theoretical base of their acting entrepreneurially. This allows for the development of entrepreneurial passion and perhaps even entrepreneurial identity in some learners. The value created as formal part of curriculum can be so significant that it sometimes leads to real-life economic growth for the collaboration partners outside the educational institution. The final output of the embedded approach is more entrepreneurial people creating new kinds of value in all domains of society and all walks of life.

53. In third step separate subject approach, theory is also made explicit. As learners approach the end of their education it is possible to add the goal of creating a sustainable venture with intention to incorporate after graduation, i.e. the sustainable venture creation approach (Lackéus, 2013). This adds to the engagement levels of students and also results in some of these ventures actually becoming real-life start-ups creating jobs and economic growth (see for example Lackéus and Williams Middleton, 2014, Barr et al., 2009). The final output of the separate subject approach is actual entrepreneurs creating ventures within or outside established organizations, but also entrepreneurial people creating growth and value in all domains of society (Williams Middleton, 2013, Lundqvist, 2014).

3.3 Future answers to the question "When to do what?"

54. In the future we can hope for a greater awareness of the need to develop and establish progression models for entrepreneurial education, rather than continuing the quest for a "one size fits all" approach to entrepreneurial education. We can also hope for researchers identifying some unifying characteristics of entrepreneurial education across all levels of education to a higher degree of certainty and with stronger empirical evidence than has been possible in this report. In the future teachers will hopefully have access to classifications, frameworks and other support material allowing them to pick and choose from a large variety of pedagogical tools and methods allowing them to more quickly identify and hone a teaching style and progression strategy appropriate to their own students, contexts and available resources. The future will hopefully also bring a consciousness that any age is the right age for introducing assignments where students use their competencies to create innovative value to people outside schools and universities. Earlier is of course better since it allows for better progression, but it is never too late to start. Such a start will hopefully also more often consist in embedded value creation for all students rather than separate venture creation for a few interested students.

4. HOW TO DO ENTREPRENEURIAL EDUCATION?

55. Many scholars state that there is only one way to learn to become entrepreneurial, and that is by learning through own experience. Cope leans on a variety of scholars (Minniti and Bygrave, 2001, Dalley and Hamilton, 2000, Young and Sexton, 1997, Gibb, 1997) when stating that there seem to be no shortcuts, it "can only be acquired through learning-by-doing or direct observation" (Cope, 2005, p.381). The research that has been done on how real-life entrepreneurs learn is however largely disconnected from the educational domain, and offers little advice to teachers. This leaves teachers with the unanswered question "learning-by-doing-*what*?". There is a need for robust advice on what to let students do in order to develop their entrepreneurial competencies.

4.1 Activities that trigger entrepreneurial competencies

56. Previous research outlined in chapters 1-3 of this report as well as empirical data collected by the author of this report (Lackeus, 2014) can give some initial advice on learning-by-doing activities that can trigger the development of entrepreneurial competencies. Teachers should give their students assignments to create value (preferably innovative) to external stakeholders based on problems and/or opportunities the students identify through an iterative process they own themselves and take full responsibility for. Such assignments lead to repeated interactions with the outside world,

which triggers uncertainty, ambiguity and confusion. This should be regarded as a positive outcome and a source of deep learning. To alleviate the levels of difficulty and uncertainty such an assignment can result in, a team-work approach should be applied giving the students access to increased creative ability and peer learning opportunities. Sufficient time allowing for establishing fruitful relationships with external stakeholders should also be given to the students, preferably months or years. Robust advice on how to manage the value creation process should be given to the students, some of which will be outlined below in this chapter. Figure 10 outlines the relation between educational assignments, triggered activities / events and developed entrepreneurial competencies.

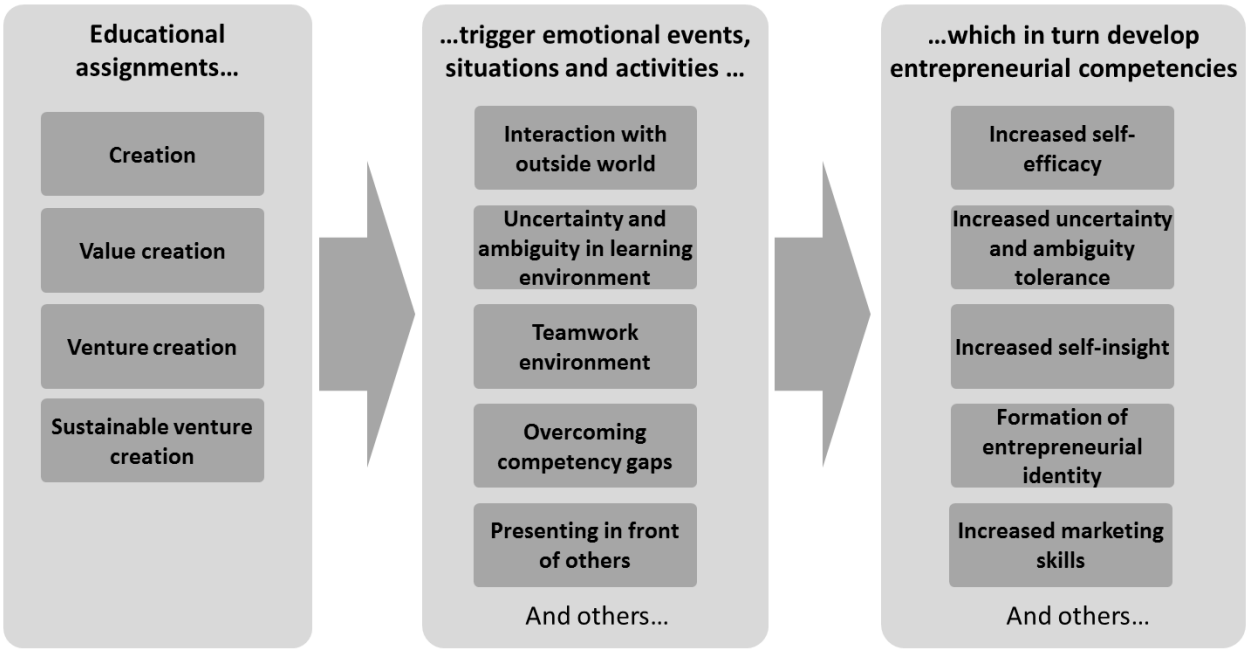

Figure 10. A model of entrepreneurial education and its outcomes. *The relationship between educational assignments, emotional events / situations / activities and developed entrepreneurial competencies.*

57. The assessment of such an assignment should concentrate on the activities triggered rather than the developed entrepreneurial competencies (Lackéus, 2013). Each individual's contribution in terms of interaction with outside stakeholders should be assessed and supported by the teacher continuously. In line with a Vygotskian perspective on learning (Roth and Lee, 2007), it is the interactions and activities that drive the learning process, and these interactions and activities should therefore be the focus of teachers' assessment rather than the evasive entrepreneurial competencies. Assessment strategies could include asking students to report names and other practical information about external stakeholders contacted, occurrence of external stakeholders willing to engage with the students, and letting students reflect on whether the value creation attempts were appreciated by the external stakeholders (for more examples, see Lackéus, 2013, p.34). Such assessment strategies will lead to what is often called constructive alignment, i.e. when the assessment applied is in alignment with what the students need to do in order to achieve the learning outcomes stated by the teacher (Biggs, 1996).

4.2 How learning-by-doing works

58. Figure 11 outlines a conceptual model for learning-by-doing based on Russian researchers such as Vygotsky, Leont'ev and Galperin. In learning-by-doing the student takes action together with other people, primarily classmates but also external stakeholders. This interaction is based on a shared

set of "mediating artifacts", such as shared tools, rules, processes, knowledge, signs, ideas etcetera. A tool-mediated view on learning was proposed by Vygotsky as a reaction to the predominant acquisition-based model of learning in solitude explored by Piaget and others (Egan, 2004), where prepackaged knowledge is transmitted to passive recipients (Kozulin, 2003, Kozulin and Presseisen, 1995). The term "artifact" can be broadly defined as anything created by human art and workmanship (Hilpinen, 2011). According to Vygotsky and colleagues, human activity leads to two main outcomes; "externalization of activity into artifacts" (Miettinen, 2001, p.299) and "internalization of activity and gradual formation of mental actions", i.e. construction of new mental abilities (Arievitch and Haenen, 2005, p.159). Here, externalization is the resulting value creation and internalization is the resulting deep learning. Shared artifacts, new artifacts and mental artifacts can all consist of tools, rules, processes, knowledge, ideas, etc.

59. Also illustrated in Figure 11 are the concepts of surface learning defined as memorization and acquisition of facts, and deep learning defined as abstraction of meaning and interpretation of experience (Jarvis, 2006). Surface learning informs action, and deep learning is the result of the shared inter-action. Deep learning is therefore by definition meaningful to learners, which leads to increased motivation. If the artifacts created become valuable to a wider community it will also trigger even higher levels of motivation and engagement. In essence, learning-by-doing can be regarded as an emotional and motivation laden process, where motivational levels depend on (1) what actions are taken, (2) what learning occurs and (3) what value is created.

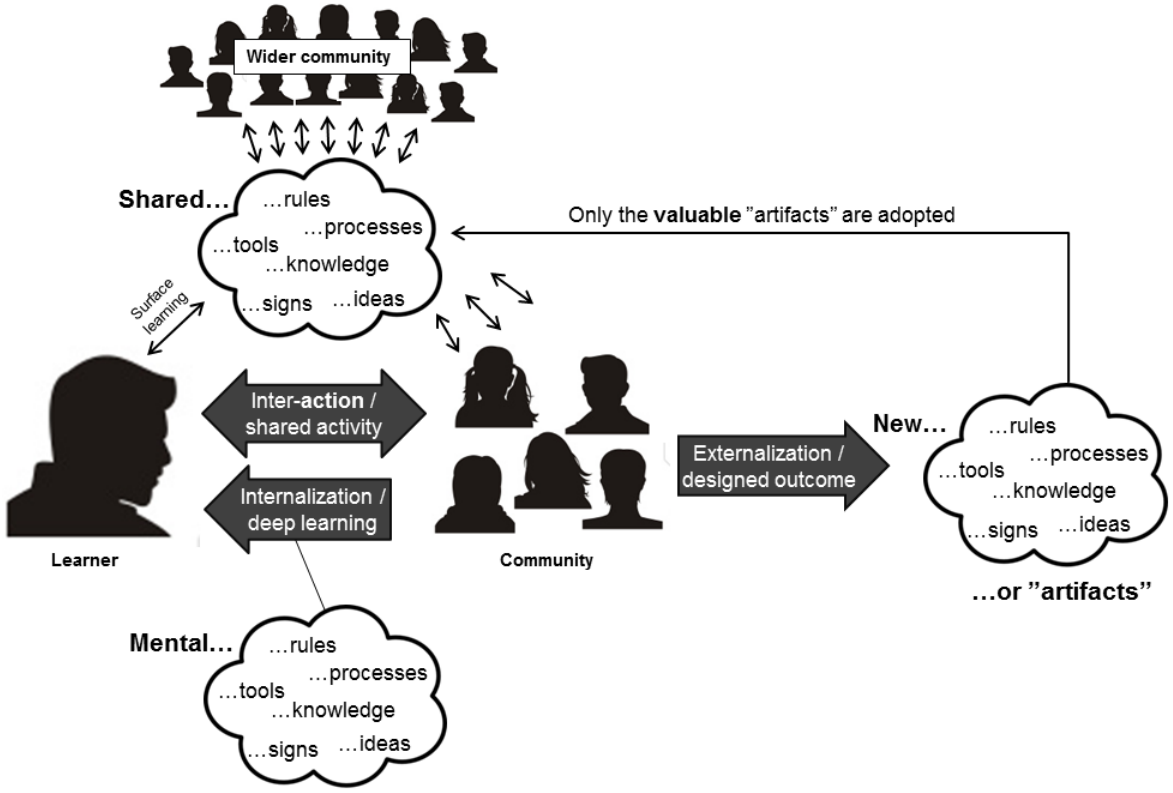

Figure 11. Conceptual model for learning-by-doing. *Outlines how learning and value creation are interconnected in learning-by-doing and how they reinforce each other. (Lackéus, 2013)*

60. This framework shows how learning (internalization) and value creation (externalization) are interconnected and can reinforce each other. The importance of a learner perspective for value creators such as entrepreneurs has been acknowledged before (see for example Cope, 2003). The importance of

a value creation perspective for learners has also been acknowledged before (see for example Blenker et al., 2011), and is perhaps one of the most important contributions that entrepreneurship can make to the educational domain. Psychology research also explains why a learning-by-creating-value approach can increase motivation, having shown that student motivation and enjoyment is enhanced through actions that are perceived both as controllable and valuable (Pekrun, 2006), and that participation in valued and challenging goal-oriented activities can result in strong feelings of confidence, happiness and motivation (Cantor and Sanderson, 2003). In fact, entrepreneurship has been described as altruistic acts of helping others (Gilder, 1981). The author of this report has labeled this an "altruistic paradox" in that we get much more motivated by doing good for others today than by doing good for ourselves in a distant future (Lackéus, 2013, p.35).

61. This framework for learning-by-doing also allows us to connect wide definitions of being entrepreneurial to the process of learning-by-doing. Mahieu (2006) has described the entrepreneurial culture promoted by OECD since 1989 as consisting of qualities such as habits of "learning, curiosity, creativity, initiative, teamwork and personal responsibility" (p.63). A learning-by-doing approach as framed here fosters habits of learning by default through its deep learning component. It also promotes initiative and responsibility, since it encourages people to take initiative to inter-action of the kind that leads to meaningful outcomes, sometimes even valuable to a wider community (i.e. taking responsibility). It is inherently teamwork based due to its reliance on interaction, and if the outcome is both novel and valuable to others it also fulfills what commonly is defined as creativity (Amabile and Khaire, 2008).

4.3 Some tools that can support the value creation process

62. The entrepreneurship domain is replete with models and frameworks outlining how entrepreneurs can go about creating value. Some of the more contemporary models and theories have a more explicit focus on value creation rather than venture creation, and can therefore be more easily used in general education. Three of them are outlined in table 6 and contrasted to the four basic kinds of activity outlined in the unified progression model earlier that have been shown to trigger development of entrepreneurial competencies. Also outside the entrepreneurship domain there are a few models and framework that can assist in value creation. Three of them deemed to be particularly helpful in entrepreneurial education are also outlined in table 6 and contrasted to the same four kinds of activity.

4.3.1 Effectuation

63. The concept of *effectuation* represents a quite practical and hands-on approach to teaching "through" entrepreneurship. It has been developed by Saras Sarasvathy and colleagues (see for example Sarasvathy, 2001, Sarasvathy and Dew, 2005, Sarasvathy and Venkataraman, 2011). Effectuation is described as an iterative process of decision making and active commitment seeking that results in creation of new value, where each iteration is started with questions such as "Who am I?", "What do I know?" and "Whom do I know?". Sarasvathy and Venkataraman (2011) propose that entrepreneurship could be regarded as a generic method for creating potentially valuable change by unleashing human potential, and has contrasted this to the scientific method designed to harness mother nature. Viewing entrepreneurship as a generic method holds much promise for the field of entrepreneurial education, but requires emphasis on taking action, value creation and using creativity tools (Neck and Greene, 2011).

Table 6. Tools, models and theories helpful for entrepreneurial education teachers. *Three concepts from the entrepreneurship domain and three concepts from other domains that could offer robust advice to teachers on various aspects of how to design innovative and iterative value creation processes.*

	Value creation	**Interaction with outside world**	**Team work**	**Action**
Some tools, models and theories from the entrepreneurship domain				
Effectuation (Read et al., 2011)	"Begin with a simple problem for which you see an implementable solution – or even something that you simply believe would be fun to attempt" (p.19)	"Meeting someone new changes 'who you know', … 'what you know' and perhaps 'who you are'" (p.145)	"Those who choose to join the venture … ultimately make the venture what it is" (p.113)	"Action trumps analysis - … mundane ideas can lead to successful businesses simply by doing the next thing and the next thing and the next." (p.50)
Business Model Canvas (Osterwalder and Pigneur, 2010)	"A business model describes the rationale of how an organization creates, delivers and captures value" (p.23)	"What does [the customer] see? …hear? …think and feel? …say and do? What is the customer's pain? …gain? " (p.131)	"The business model canvas works best when printed out on a large surface so groups of people can jointly start sketching and discuss" (p.42)	"The starting point for any good discussion, meeting or workshop [is] a concept that allows you to describe your [idea]. (p.15)
Customer development / Lean Startup (Blank and Dorf, 2012)	"What is the smallest or least complicated problem that the customer will pay us to solve?" (p.80)	"There are no facts inside your building, so get outside ... and into conversations with your customers" (p.24/ 31)	-	"Conduct experiments to test your 'problem' hypothesis" (p.67)
Some tools, models and theories from other domains				
Appreciative Inquiry (Bushe and Kassam, 2005)	"Rather than focusing on problems that need solving, appreciative inquiry focuses on the examples of the system at its best" (p.165)	"Inquiry is intervention, … as we inquire into human systems, we change them." (p.166)	"Sentiments like hope, excitement, inspiration, camaraderie, and joy are central to the change process" (p.167)	"the inquiry should create knowledge, models, and images that are compelling to system members and provoke people to take action. (p.165)
Service-learning (Kenworthy-U'Ren et al., 2006)	"Creating tangible and intangible benefits for involved participants" (p. 122)	"students engage in real-world, concrete, professional, semester-long consulting experiences" (p.128)	"involves faculty, students and community working together." (p. 122)	"thinking and action are inextricably linked" (Giles and Eyler, 1994, p.80)
Design thinking (Dunne and Martin, 2006)	"visualizing and imagining something that does not now exist that would take care of users' needs" (p. 514)	"go out and understand users, understand everything they can about users, … skills of observation and inquiry." (p.514)	"collaboration with peers play an important part in the process." (p.519)	"focus on the relation between creation and reflection-upon-the-creation that allows for constantly improved competence" (Johansson-Sköldberg et al., 2013, p.124)

64. Effectuation constitutes a useful toolbox for teachers in any domain and on any educational level. A student team can be asked to identify a simple problem in real life they would like to address. Preferably this problem is identified by taking into account the team's diverse interests, competencies and previous experiences. By interacting iteratively with the outside world they can learn more about the problem, the people affected by it and how they can help. They need not be anywhere near a solution when initiating the process, they only need to focus on the next step that needs to be taken to approach the problem and learn more about it. A book by Read et al. (2011) targeted to teachers and practitioners provides ample practical advice when using the effectual approach. This book and its concepts is somewhat venture creation focused, but many of the principles can be applied to value creation processes in all stages of education.

4.3.2 Business Model Canvas

65. The Business Model Canvas outlined by Osterwalder and Pigneur (2010) consists of nine basic building blocks needed when creating value to external stakeholders. This could be viewed as a simple checklist that students can use when planning their value creation attempts, asking them to provide answers to key value creation questions such as "Who do you help?", "How do you help?", "Who helps you?" and "What do you do?". It is particularly useful when working in groups allowing for sketching and discussing around ideas outlined by the team. Here too the language is business biased, but the principles are applicable to a wider context than venture creation. In fact, Osterwalder and his colleagues have written a book on how to apply these nine building blocks to personal development, which is well in line with a wide definition of entrepreneurship (Clark et al., 2012).

4.3.3 Customer development / Lean Startup

66. From Silicon Valley in United States comes two concepts that have quickly reached worldwide adoption among entrepreneurs; customer development (Blank and Dorf, 2012) and lean startup (Ries, 2010). These two concepts share many basic ideas and concepts and emphasize the need for quickly validating a hypothesis of whether some product or service creates value to people. The books by Blank, Dorf and Ries contain a wide variety of perspectives, methods and tools that help entrepreneurs take action through experimenting with real world stakeholders instead of getting stuck in planning and analyzing what might happen. These tools can also be applied to the educational domain allowing teachers to give robust advice to students on how to manage a value creation process involving outside stakeholders. Students can ask themselves questions such as "What can we ask a prospective customer *today*?", "How can we test our guesses on real people outside school?" and "How can we expose ourselves to the risk of being proven wrong?". While useful for supporting taking action and interacting with the outside world they however do not give any firm advice on team work issues.

4.3.4 Appreciative Inquiry

67. Appreciative Inquiry (AI) is a theoretical framework having its origins in the domain of organizational behavior. It has been identified as useful in the entrepreneurial education domain due to its emphasis on opportunities rather than problems (Blenker et al., 2011). As entrepreneurship has been defined as the crossroad between individuals and opportunities (Shane, 2003), AI is a theoretical framework implicitly anchored in entrepreneurship. It has been described as a method suitable for generating new ideas triggering action and "a new lens for seeing old issues" (Bushe and Kassam, 2005), and can lead to questions such as "What methods have been successful before?", "What can we learn from what works well?", "How can we get more of what is good in the future?" and "What do we need to do to realize our dreams?". A unique contribution of this theory is its strong capacity to infuse inspiration, joy and motivation into the teams working with a value creation process which

often requires coping with change. Positive energy and motivation are key in change processes, since people's resistance to change is well documented (Beer et al., 1990, Kotter, 1995). Such a source of motivation is important in education since learning and motivation are strongly linked (Boekaerts, 2010).

4.3.5 Service-learning

68. Service-learning has been defined as "an organized educational experience that both meets needs of the community and fulfills learning objectives" (Steinke and Fitch, 2007, p.24), i.e. classroom instruction integrated with community service such as cleaning parks, visiting elderly and providing food to people in need (Spring et al., 2008). It has been described as an approach somewhere in between internships, practica and volunteerism (Kenworthy-U'Ren et al., 2006). The approach has been applied in many educational disciplines, such as nursing, literacy learning, computer science, engineering, teacher education and business (Desplaces et al., 2009). It shares theoretical roots with entrepreneurial education in that both approaches have been stated to branch out from the educational philosophy of John Dewey (Giles and Eyler, 1994, Pepin, 2012). Still, very little research has been done on the interaction between them (For some exceptions, see Desplaces et al., 2009, McCrea, 2009, Litzky et al., 2009). Teachers interested in working with entrepreneurial education could probably learn much from service-learning initiatives, such as components of successful service-learning programs (Kenworthy-U'Ren et al., 2006) and factors that motivate and deter use of a service-learning approach in educational institutions (Abes et al., 2002). A common challenge for teachers in service-learning is how to create an activity that truly matches the needs of the community with the learning needs of the student.

4.3.6 Design Thinking

69. Design has been defined in many ways. Design could mean the creation of artefacts, it could mean problem-solving activity, it could mean a way of reasoning, reflecting and creating meaning (Johansson-Sköldberg et al., 2013). For the purpose of developing a curriculum for entrepreneurship, Boni et al. (2009, p.409) defined design as "a process of actions and decisions aimed at producing products, services, environments, and systems that addresses a problem and improves people's lives", i.e. an inherently action-based approach to value creation. Brown (2008) pictures design thinking as a team-based iterative three-step process of 1) being inspired by the world through observing it closely looking for problems and opportunities, 2) brainstorming around plausible ideas for concepts that can help people and 3) testing these ideas on users through prototypes. Design thinking focuses on a creative search for what might be, instead of being limited by what is and what "should" be (Dunne and Martin, 2006). For teachers, design thinking represents yet another field where an emerging set of practices, tools and methods could be transferred and contextualized to an educational setting, supporting student learning and creativity. Students can ask themselves questions such as "How can we observe people in their authentic environment and reflect on their needs?" and "How can we solve their problems differently from anyone else?".

4.4 Scaling entrepreneurial education

70. Educational reform often aims to achieve large-scale spread of good educational practices to classrooms. Most initiatives however fail in impacting classrooms and teaching practices (Kliebard, 1988, Fullan, 2007). The core of schooling remains relatively stable despite massive changes in the surrounding structures. This is due to teacher resistance, lack of incentives for change and institutions protecting the classroom from the ebb and flow of recurring educational reform (Elmore, 1996, Cuban, 2007, Cuban, 1990). If entrepreneurial education is to be scaled to something more than pockets of

excellence in isolated classrooms and schools, a number of key success factors of educational reform need to be taken into account.

71. Elmore (1996) has given some general recommendations based on previous major failures in educational reform, which can be applied to entrepreneurial education. Strong normative structures in entrepreneurial education for good teaching, evaluation, monitoring, inspection and feedback to teachers need to be established by multiple levels of authority external to schools and universities. Small groups of teachers consisting of both committed and skeptical teachers need to be established. These groups need to be given strong encouragement, support, time for focus and access to special knowledge. Teachers further need to be given the opportunity to iteratively and in teams learn by doing in their own classroom and by observing in others' classrooms, finding and honing an approach to entrepreneurial education that fits their particular context. A compelling reason to change practice also needs to be present, such as strong evidence for significant improvements in student learning. Elmore strongly dismisses the common practice of sending teachers off to training and expecting them to come home to their school and radically change their way of teaching.

72. Service-learning literature contributes with recommendations similar to Elmore's on how to support teachers (Abes et al., 2002). Mentoring, advice from colleagues, supporting office and professional organizations / conferences were the most important support factors stated by practicing teachers. The most important challenges to working with a service-learning approach was time, logistics, funding and incentive structures. Elmore's reasoning also explains why emphasizing job creation, economic success and renewal needs of society will perhaps never become a compelling reason for teachers to adopt entrepreneurial education practices. Many teachers will probably reason that what is good for society long-term is not necessarily good for student learning short-term, and on those grounds dismiss entrepreneurial education. Benefits such as joy, engagement, creativity and learning by taking on societal challenges could however be much more viable reasons for teachers to adopt entrepreneurial education practices, especially if proven that they contribute to strengthened academic mindsets and resulting academic performance. Emerging proof of this kind is coming from research both on entrepreneurial education (Deuchar, 2007, Surlemont, 2007, Mahieu, 2006, Nakkula et al., 2004, Moberg, 2014a) and on non-cognitive competencies (Farrington et al., 2012, Morrison Gutman and Schoon, 2013, Levin, 2013).

73. An important factor for change is also that new teaching practices are supported by laws, policies or regulations in line with broad social and political forces in society (Kliebard, 1988). In Sweden the addition of the word "entrepreneurship" (without even being defined or explained) in one single instance in a 281 pages long curriculum document issued by the Swedish National Agency for Education (Skolverket, 2011) has made a significant difference to the discussion and interest around entrepreneurial education among school teachers, principals, policymakers and other stakeholders (see further in Hörnqvist and Leffler, 2014).

4.5 Organizing interaction with the outside world

74. Interaction with the outside world is a key aspect of entrepreneurial education (Lackéus, 2013, Gibb, 2008). The most developed systems for facilitating educational institutions' interaction with the outside world can be found on university level. In a research string labeled "the entrepreneurial university" it is outlined how increased collaboration between universities, government entities and industry can be facilitated in accordance with a "triple helix model" (Etzkowitz and Leydesdorff, 2000). This is supposed to lead to economic growth, more entrepreneurial people and increased practical utilization of the knowledge generated at universities. This is called the "third mission" of universities (Philpott et al., 2011), and is often organized through "technology transfer offices" (TTOs) responsible for acting as an interface between the university

employees and the outside world. Common outputs of TTOs are licensing and royalty agreements for research-based intellectual property, informal transfer of know-how and product development collaboration (Siegel et al., 2003).

75. The role of students and learning in such interactions with the outside world has however not been a focus area for research nor for practice, rather the exception. There is almost no overlap between research on entrepreneurial education and research on technology transfer (Nelson and Byers, 2010). Only recently the opportunity of combining learning and value creation on university level has started to get noticed and acknowledged (Moroz et al., 2010, Meyer et al., 2011). One approach that is growing is the "venture creation approach" (Ollila and Williams-Middleton, 2011) where students get to create real-life ventures with intention to incorporate them after graduation. This approach has been shown capable of both increasing the entrepreneurial capacity available in a region, create jobs and alleviate the challenges with early stage university commercialization, often termed a "valley of death" (Lackéus and Williams Middleton, 2014, Barr et al., 2009). While this is early stage development, it represents cases from which other educational institutions can learn more about how to combine student learning and value creation. Some challenges identified are false perceptions of students' inability to create value, allegations of being too practice oriented thereby losing out on content and theory, low levels of predictability in the learning process and challenging resource demands (ibid). Some requirements for successful combination of learning and value creation have also been identified, such as the presence of strong top management support, financial resources and operative champions managing the change process (Lackéus et al., 2011).

76. The most important factors for interaction with the outside world on primary and secondary levels of education are similar to those on university levels. Key factors are support from the school management, capacity to build organizational strength and clear goals and incentives (Sagar et al., 2012). Other important factors include a flexible time schedule with students allowing for longer uninterrupted lessons, time allowed for pedagogical discussions among teachers, time allowed for managing the change process and individual reflections needed to shape a new way of teaching. The teacher's and his/her colleagues' personal character traits and dispositions are also key factors since it takes courage to let go of the control when introducing uncertainty and ambiguity into educational processes. A well-functioning teacher team is seen as a requirement whereas skeptical colleagues are seen as barriers (Sagar et al., 2012). Since entrepreneurial education stipulates interaction with outside world for all levels of education, there should be opportunities for primary and secondary education levels to learn from the more advanced support structures found on higher education levels, given certain contextualization to school environments.

4.6 Future answers to the question "How to do entrepreneurial education?"

77. In the future we can hope for increased understanding of when, how and why learning-by-doing works and how it can be integrated into education on all levels and for most (if not all) subjects. The tools, methods and concepts presented in this chapter have hopefully been contextualized to education resulting in curriculum material supporting teachers and students, a task preferably accomplished through close collaboration between experienced and committed teachers on all levels of education and researchers in entrepreneurship *and* education, in line with recommendations by Elmore (1996). A more comprehensive list of tools, methods and concepts useful for iterative student-driven value creation processes in education will hopefully be compiled, together with illustrative case studies outlining generalizable features. The code will hopefully be found for how to unlock the door to the classroom, leading to teachers widely adopting effective and efficient entrepreneurial education pedagogy. If so, it will have happened through a concerted effort involving teachers, students, parents, principals, policymakers, researchers, authorities, international associations and other key stakeholders, all playing their important role in the substantial challenge of succeeding in educational

reform. In the future we will hopefully also see the establishment and strengthening of explicit support structures in schools, colleges and universities as well as other crucial management and organizational structures, supporting teachers and students in the task of interacting with the outside world leading to tandem learning and value creation.

5. CONCLUSIONS

78. This report has discussed many of the opportunities with entrepreneurship in education, such as its capacity to trigger deep learning and instill engagement, joy, motivation, confidence and feelings of relevancy among students, but also its stated and to some extent evidenced effects on job creation, economic success, renewal and innovation for individuals, organizations and society at large. The many challenges have also been discussed, such as lack of support, time and resources in educational institutions, assessment difficulties for both teachers and researchers, definitional confusion partly due to absence of a progression approach, the considerable challenges any novel educational reform faces and the lack of firm advice to teachers searching for answers to the crucial question of learning-by-doing-*what*?

79. In an attempt to remedy some of these challenges an idea of putting value creation at the heart of entrepreneurial education has been put forward in this report. Theoretical foundations, related research and practical implications of this idea have been put forward, along with contrasting of entrepreneurial education defined this way to other pedagogical approaches, debates and frameworks. Six different tools, methods and approaches from various fields have been outlined and stated to be capable of contributing with practical advice to teachers and students in their attempts to create value to external stakeholders as formal part of curriculum.

80. The report has also outlined some hopes for the future in terms of how entrepreneurial education will be perceived in the future, why it will be deemed to be relevant and effective, when it will be applied and how it will be done in practice by future teachers and related stakeholders. Some important areas for future improvement have been put forward, such as a need to increase awareness of entrepreneurial education as a pedagogical approach relevant to all students and on all levels of education, a need for more and closer collaboration between researchers and practitioners in the two domains of education and entrepreneurship, a need for closing the gap between stated and desired effects of entrepreneurial education and a need for increased understanding of when, how and why entrepreneurial education can develop entrepreneurial competencies, especially on primary and secondary levels of education and with an embedded approach.

81. Despite its promising effects on students and society, it is important to keep in mind that the field of entrepreneurial education is in a quite early stage of development. It is still regarded as an innovative but marginal pedagogical approach spurring much interest but also much confusion among various stakeholders. There is tremendous work remaining if we are to succeed in making effective and efficient entrepreneurial education available to a majority of people in the educational systems of the world. And the road to achieving such an ambitious goal is still long, winding and risky. Hopefully this report can constitute some guidance to committed drivers on this road.

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