

## AN EPIC LITERATURE REVIEW

This literature review is one of the deliverables of the EEEPHEIC project. It is accompanied by a review of policy documents and an overview of entrepreneurship programmes that have been categorised through the categorisation model developed in the project.



## 1. AN EPIC LITERATURE REVIEW<sup>1</sup>

*By Kåre Moberg, PhD, The Danish Foundation for Entrepreneurship*

“[...] while coming up with some sort of evaluation is relatively easy, being sure it is valid is more problematic.” McMullan, Chrisman & Vesper, 2001.

The above quote clearly demonstrates the challenges we face in the EEPHEIC project (Evaluation of Entrepreneurship Education Programmes in Higher Education Institutions and Centres). The goal of this project is not only to develop an evaluation tool that can be used by educators to assess their education's influence on their students, but also to develop a categorisation model of entrepreneurship-focused programmes at higher education institutions (HEIs). However, since context, target group, level and educational focus are all factors that influence outcomes of educational programmes, it is natural that both categorisation and assessment tools are developed in tandem, as the one presupposes the other.

As will become evident in the review presented in this report, there is no shortage of tools for assessing the effects of entrepreneurship education. However, very few of these tools offer actionable feedback to educators. Figuring out how to develop an assessment tool that can be both valid and reliable and, at the same time, provide relevant feedback to its users, is a challenge that still needs to be solved.

In order to develop a reliable and valid assessment tool and a categorisation model, we have performed an extensive literature review. In the following, the background and rationale, the scope and the method, as well as the results and recommendations of this literature review are presented.

### 1.1. Background

Entrepreneurship is multifaceted. This can be viewed both as a strength and as a weakness. On the one hand, there are many difficulties in defining it conceptually, which makes it difficult to grasp, analyse and discuss, let alone to teach. On the other hand, it makes entrepreneurship relevant in many situations and contexts. It is thus important to teach it to a broad scope of students. The conceptual ambiguousness has increased over the decades, as entrepreneurship is increasingly viewed as a phenomenon rather than as defined by a context, such as small business owners (Davidsson, 2001). Rather than teaching it as a well-defined topic with a clear and codified content, many teachers and researchers within the field argue that it should be taught

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as a method (Neck & Greene, 2011; Neck, Greene & Brush, 2014; Sarasvathy & Venkataraman, 2011). Proponents of this view argue that being able to act entrepreneurially and to turn knowledge into value is as relevant as understanding how we retrieve knowledge about the world. In their view, we should teach the entrepreneurial method to all students and pupils, similar to how we teach the scientific method to all students and pupils (Sarasvathy & Venkataraman, 2011).

However, this broad definition has made entrepreneurship difficult to grasp for many educators. In order to make it less ambiguous, multiple taxonomies that outline teaching and learning goals at different educational levels have been proposed. The Danish Taxonomy of Entrepreneurship Education (Rasmussen & Moberg, 2016), the British QAA for tertiary level education (Penaluna et al., 2017), the Austrian TRIO-model (Aff & Lindner, 2005), and the EntreComp (Bacigalupo et al., 2016) are examples of some influential taxonomies within the field. Although these taxonomies outline what is important to focus on, many of the competences are difficult to codify and thus difficult to teach and assess with traditional methods (Moberg, 2014). Many of the competences are fostered by means of *how* the topics are taught, rather than by means of *what* is being taught (Neck & Greene, 2011). Given the vagueness of the field and educators' general unfamiliarity with the teaching methods, it is important to further our understanding of which type of influence different teaching approaches have on different types of students (Rideout & Gray, 2013). In order to do this, it is important that reliable and useful evaluation tools are available to practitioners in the field.

This complexity pinpoints the problems that accompany categorisation and assessment of educational initiatives focusing on entrepreneurship. Both categorisation and assessment tools need to be flexible in order to accommodate not only various topics and disciplines but also various approaches to entrepreneurship. It is important that the tools can be used effectively for educational initiatives with a strong focus on venture creation, but it should also be possible to use them for initiatives that focus more on intrapreneurship and enterprising skills.

## **1.2. Scope of the review**

In order to get an overview of related works, taxonomies, categorisation models and assessment tools, the scope of the review is broad. It is divided into three parts: 1) Academic research, 2) Taxonomies and categorisation models, 3) Assessment tools and related projects. The broad scope of the review makes it impossible to achieve a complete overview of everything that has been performed within this highly debated and engaging topic. We have relied on active and deliberate search as well as on the contextual knowledge of the project partners and the expert panel.

The academic review includes eight review articles of the field. Four of these have been performed on a decennial basis and provide us with an overview of how the field has developed from the early 1970s to the present day. The other four were selected based on their specific focus on assessment and teaching methods. Four taxonomies and one categorisation model have been identified. To complement this academic review with literature closer to the practitioners, we have reviewed four entrepreneurship taxonomies, three projects about assessing entrepreneurship and 25 assessment tools.

## 2. ACADEMIC LITERATURE REVIEW

In order to get an overview of the academic research performed within the field, we decided to focus on literature reviews. Four literature reviews specifically stand out, since they relate to each other and have been performed on a decennial basis. The four reviews are: 1) Dainow (1986); 2) Gorman, Hanlon & King (1997); 3) Pittaway & Cope (2007); 4) Nabi et al. (2016). In addition to these reviews, four reviews with a specific focus on assessment, effects, outcomes and teaching methods were included: Henry, Hill & Leitch (2005a, b), Mwasalwiba (2010), Hägg & Gabrielsson (2017), and Shepherd et al. (forthcoming).

### 2.1. Categorisation method

Like most of the established literature reviews within the field, we used a categorisation framework that focuses on the categories: 1) *what*, 2) *when*, 3) *how*, 4) *why*. In the *what* category it is identified what has been practically performed in the review, that is, how many journals and articles are included, and *when*, that is, which time period is covered. In the *how* category, the focus is on identifying which approach has been used when performing the literature review. In the *why* category, the specific theme of the literature review is identified. Four categories were added to this framework: 1) focus, 2) outcome variables, 3) teaching methods, 4) results. The “focus” category is a broad dimension, where the specific literature review’s focus is outlined. The “outcome variables” and “teaching methods” were added, since they are of specific interest to the EEPHEIC project. The “results” category includes findings and implications. An overview of the categorisation model is presented in Table 1 below.

<b>What</b>	Number of journals and journal articles
<b>When</b>	Time period
<b>How</b>	Method and approach
<b>Why</b>	Specific theme
<b>Focus</b>	Specific focus
<b>Competences</b>	Competences identified as being of central importance
<b>Teaching methods</b>	Teaching methods identified as being of central importance
<b>Results</b>	Findings and implications

**Table 1:** Categorisation model of literature reviews

The review starts with an in-depth analysis of the four related decennial literature reviews. This is then complemented with an analysis of the four additional reviews. Summarised and extended categorisation of each of these reviews can be found in the Appendix. The summarised versions are shorter and only include content that has influenced the analysis presented in this review. The extended versions are more comprehensive and include the related references to the topics that have been discussed in the reviews.

## **2.2. Analysis of the four decennial literature reviews**

The four reviews by Dainow (1986), Gorman et al. (1997), Pittaway & Cope (2007), and Nabi et al. (2017) provide us with an overview of the development of the field. It is clear that entrepreneurship research mirrors its time period. In the 70s and the 80s when the field was in its early stages, entrepreneurship was narrowly defined with a contextual focus (new venture creation and small business management). Over time entrepreneurship has become increasingly viewed as a phenomenon (Davidsson, 2004), relevant to a broader scope of individuals (Sarasvathy & Venkataraman, 2010).

The focus of the articles included in the review by Dainow (1986) was mainly on the development in the field, and they emphasised the need for an increased attention to evaluation and assessment of impact. However, Dainow (1986) also underlines that there is a need for cross-fertilisation with related fields such as education and instructional design. In addition to this, the importance of tailoring educational offerings to target audiences is emphasised, as well as the need to apply more varied methodologies when evaluating the influence of initiatives within the field. The focus on evaluation and education and instructional design keeps reoccurring in the reviews that follow, but the importance of applying different methodologies in assessment studies is not discussed in any of the other reviews. This is somewhat surprising since the concern about the overwhelming focus on short-term quantitative assessment methods is raised on multiple occasions. Nevertheless, alternative evaluation methods are not discussed. Rather, it is the importance of increasing the rigour of assessment studies (Gorman et al., 1997) and to use comparative and longitudinal designs (Pittaway & Cope, 2007; Nabi et al., 2017) that is emphasised.

Whereas the review by Dainow (1986) is considered as a starting point, it is only in 1997 with the review performed by Gorman et al. that these types of reviews attract significant attention. Naturally, this is mirrored by the interests of the time and the explosive growth of the field during the 90s. The definition of entrepreneurship is still narrow and focused on new venture creation. This is reflected in articles focusing on which kind of competences are found to be important and which kind of teaching methods should be applied. There is consensus regarding the importance of concrete experience and that it should derive from active

participation and project-oriented work. It is, however, emphasised that it is important to consider the target audiences and which stage in the venture creation process they are in. Given the narrow understanding of entrepreneurship as a concept during this period, it is impressive to see that already in 1987, Dana discusses the broader effects participation in entrepreneurship education can have on participants. He argues that *active participation*, which characterises entrepreneurship education, can increase student awareness and thus enhance students' ability to learn from experience.

The concept of entrepreneurship is understood in a broader sense in the review performed by Pittaway & Cope (2007). They use the concept of "enterprise" to step away from the field's focus on new venture creation. The importance of being able to act entrepreneurially in many different contexts is now recognised as being as important as new venture creation. In this understanding, entrepreneurship becomes less defined by its context and more viewed as a phenomenon. However, the focus on context increases in the studies included in the review by Pittaway & Cope. Still, this broadening of the definition seems to have had the effect that the level of detail of the competences regarded as important decreased. Instead, broader categories such as perceived feasibility and desirability as well as employability and labour market issues are used. The authors acknowledge the problems that a lack of conceptual clarity brings. They emphasise the importance of developing detailed taxonomies that can be used when developing educational initiatives within the field.

The focus of the Pittaway and Cope review is more on teaching methods and contextual and institutional issues for developing entrepreneurship and enterprise education at HEIs. As previous reviews have pointed out, there is still a lack of uniformity when it comes to educational offerings within the field. Even though the authors recognise the issues this raises, they acknowledge it as something natural for a field that has experienced rapid growth and a broadening of its focus. Many of the articles emphasise the importance of involving the industry in the educational offerings. This can be done through internships, mentoring and consulting projects. In this way, the field's overlap with employability becomes natural. There is also a strong focus on how the use of ICT and technology has altered educational offerings. Due to the broadening focus of education in the field, Pittaway and Cope emphasise the importance of considering the context when performing assessment studies, and they call for more longitudinal studies that clearly outline which teaching approaches are being assessed.

In the review by Nabi with colleagues (2017) we return to a focus on the output. This time the output is closely linked to the input, that is, the design and the teaching approach of the programmes. Rather than discussing different methodological approaches that could be applied when assessing the impact of various educational initiatives, the authors continue to emphasise the importance of considering the teaching

approach that was applied when performing longitudinal quantitative assessment studies. They argue for the importance of using comparative designs to compare the outcomes of various teaching approaches. The focus of this review is to identify which outcome variables have received too little attention in assessment studies. They argue that a focus on variables such as entrepreneurial identity, entrepreneurial passion, dispositional optimism and sense of psychological ownership has the potential of furthering our understanding of how educational offerings should be designed. They also discuss how various teaching approaches influence participants with different contextual backgrounds. Even though the authors do not find much support for any teaching approach having the advantage over another, they claim that there are indicative results pointing to the importance of applying pedagogical methods based on competence, since these would prepare participants for solving problems in real-life entrepreneurial situations.

### *2.2.1. Implications for the EEPHEIC project*

The reviews' focus on impact research makes them an important foundation for the EEPHEIC project. Naturally, this is mostly the case for the development of the assessment tool, but it can also inform our work with designing a categorisation model. A natural first step is to consider the categorisation models that were used in the reviews.

The focus on target groups and stages in the venture development process, which was applied in the review by Gorman with colleagues (1997), is important to consider, even though this might imply a narrow focus with regard to our understanding of entrepreneurship as a concept. When educational initiatives within the field focus on new venture creation, their design will be very different depending on whether they focus on the entrepreneurial propensity stage or the post start-up phase. The broad contextual approach used in Pittaway and Cope (2007) is also important to consider, since both overall and institutional context to a large degree determines the design and opportunities for development of different initiatives within the field.

In the same vein, the elaborate teaching model framework used in the study by Nabi with colleagues (2017) can inform us about pedagogical focus. The three categories, which represent different pedagogical philosophies (behaviourism, subjectivism, constructivism), will naturally influence the teaching and learning goals of the educational offerings as well as their learning outcomes. They are similar to the often-used categories: education *about/for/through* entrepreneurship. They do, however, also offer clear distinctions regarding which teaching methods belong to which category. In this sense, the teaching model approach offers the potential for being efficiently applied when categorising educational offerings. Which category the educational course or programme belongs to can be decided by assessing which teaching and learning

methods are used. It is somewhat surprising that the “embedded” category (Pittaway & Edwards, 2012) is lacking in this model. As our understanding of entrepreneurship has been expanding, there are many courses without a specific focus on entrepreneurship *per se* that still can be considered entrepreneurial due to their focus on fostering entrepreneurial competences.

The entrepreneurial competences and teaching methods that have been identified in these reviews should be considered when developing the categorisation model and the assessment tool. Even though the understanding of entrepreneurship as a concept has broadened in the later reviews, the competences perceived as important are fairly similar. Although venture creation and enterprising behaviour are two different activities, it should come as no surprise that the competences identified as important are to a large degree similar. The competences that are considered to be entrepreneurial have to a large degree been identified through observations and studies of practicing venture creators (Moberg, 2014). The competences and dimensions identified by Nabi with colleagues (2017), especially the ones they perceive as having received too little attention, are of specific importance when developing a new assessment tool. In addition to these competences, it will also be especially important to consider the development within ICT, since this has greatly influenced the field during the last decennia, and it is a trend that will only continue to develop and grow.

The reviews offer many insights that should be considered when developing an assessment tool. It is surprising to see that the consecutive reviews do not follow up on the call by Dainow (1986) that there ought to be an increased focus on applying different methodologies when assessing the impact of initiatives within the field. Naturally, this can be due to the specific focus of the reviews. However, since the reliance on quantitative pre and post surveys seems to have offered us limited evidence regarding which type of influence various approaches within the field have, it seems natural to consider different methods when developing new assessment tools.

Gorman with colleagues (1997) emphasise that it is also important to consider which stage of the venture creation process the educational initiative focuses on. Pittaway and Cope’s focus on context is always relevant, since the learning outcomes will to a large degree depend on this. For evaluation tools to meet these demands, it is necessary to build flexibility into the tool’s design. This will allow different target groups in different contexts to tailor the evaluation to their needs.

There is fairly much focus on the influence of entrepreneurship education on alumni students, especially in the articles included in the review by Pittaway & Cope (2007). In their review, there is also extensive focus on employability, and to some degree citizenship. In order to function as effective assessment tools of initiatives within the field, it is important to consider how to capture and assess the influence that

programmes have had on alumni students. This will require a fairly different design compared to assessment tools that aim to capture immediate and short-term influence.

The review by Nabi with colleagues (2017) makes it evident that it is important to include multiple measures of contextual background, because they are important when it comes to what type and which degree of influence the various educational initiatives will have.

In addition to focusing on entrepreneurial outcomes, it can also be of interest to focus on more education-oriented variables such as motivation and engagement, which was pointed out by Dana already in 1986. This has unfortunately received little interest in the consecutive literature reviews.

### **2.3. Analysis of four additional literature reviews**

The four decennial reviews presented above are a natural starting point. However, there are numerous literature reviews in the field<sup>2</sup>. Many have a traditional structure and add very little in regard to identifying categories and outcome variables. In relation to our focus on developing categorisation models and assessment tools, four review articles were deemed as being of specific interest: Henry et al., 2005a, b (a two-part review that contains the questions whether or not entrepreneurship can be taught and how it should be assessed); Mwasiblia, 2010 (categorisation of articles according to educational objectives, teaching methods, and impact indicators); Hägg & Gabrielsson, 2017 (a review of how the field has developed in regard to pedagogical focus); and Shepherd et al. *forthcoming* (focus on outcome variables in entrepreneurship research). In the following, these reviews will be presented and analysed. Summarised and extended categorisation of each of these reviews can be found in the Appendix.

#### *2.3.1. From entrepreneurship to entrepreneurship education to entrepreneurship research*

The four reviews echo the concerns of the decennial reviews regarding the field's lack of conceptual clarity. However, they problematise different aspects of this conceptual confusion. Henry et al. (2005a, b) are concerned about the teachability of the topic and discuss this by dividing it into the "science" and "art" of entrepreneurship. The "science" of entrepreneurship, which consists of management-oriented skills, is

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<sup>2</sup> See Aldrich (2012), Baptista & Naia (2015), Block & Stimpf (1992), Byrne et al., (2014), Curran & Stanworth (1989), Dana (1992), Garavan & O'Conneide (1994), Greene et al., (2004), Liñán & Fayolle (2015), McMullan & Long (1987), Naia et al. (2014, 2015), Plaschka & Welsch (1990), , Ronstadt (1985), Sirelkhatim & Gangi (2015), Solomon (2007), Solomon & Weaver (1994), Solomon et al. (1994), Vesper (1982), Vesper & Gartner (1997), Welter & Lasch (2008), Zeithaml & Rice, 1987, for examples of this. In addition to this, there are two large-scale quantitative meta-analyses (Bae et al., 2014; Martin et al., 2013) and topic-specific reviews of assessment and evaluation practice (Pittaway et al., 2009; Pittaway & Edwards, 2012; Rideout & Gray, 2013; Story, 2000) as well as reviews of how the field has developed (Katz, 2003, 2008; Kuratko, 2005).

teachable, whereas the “art” of entrepreneurship, which consists of more non-cognitive skills (soft skills), is not. It is noticeable that the article by Henry et al. was written at a time when approaches within entrepreneurship research that aimed to unravel the black box of the entrepreneurial method, such as effectuation (Sarasvathy, 2001) and bricolage (Baker & Nelson, 2005), had begun to get traction, but whose influence on education in the topic had only just begun. However, a vivid discussion about the effectiveness of action-oriented teaching methods is already taking place. Key actors, such as Alan Gibb, advocated the importance of focusing more on the entrepreneur and his or her life world when designing educational offerings (Gibb, 1987). In a similar vein, Shepherd and Douglas (1996) questioned whether action-oriented teaching methods such as role play, simulation and problem solving could actually be effective within the confines of the classroom, since this setting promoted logical rather than creative or entrepreneurial thinking.

Mwasilviba (2010) argues that there has been convergence towards a single framework within the field, where the focus is not so much on venture creation but rather on attitude change. In his view, the conceptual confusion stems from diverging approaches within the field, that is, “entrepreneurship education” and “enterprise education”.

The review by Hägg and Gabrielsson is written at a time when method-oriented approaches were well-established and is joined by, for example, the Lean start-up (Ries, 2011) and the Business model canvas (Osterwalder & Pigneur, 2010). The concern of these researchers is not so much whether entrepreneurship is teachable or not, but rather whether the increasing focus on action-oriented teaching methods leads to valuable learning for the students. They recognise that the balance between including educators with a research background within the field, on the one side, and practicing entrepreneurs, on the other, has improved. However, they find that entrepreneurship education as a field has developed separately from research in entrepreneurship. Very little research findings in entrepreneurship are implemented in educational offerings. They thus call for an increased focus on how research progress in entrepreneurship can inform entrepreneurship education.

To some extent we answer this call by including the review by Shepherd et al. (forthcoming) in which the focus is on identifying which dependent variables have been used in entrepreneurship research. Their view is that the multiple concepts and outcome variables experienced within the field should be viewed as something positive, since they provide greater research relevance, unique insights and theoretical insights. Although the focus on financial performance is still dominating due to shared common roots with strategy, the field has witnessed an increased focus on psychological and sociological variables. Much research focuses on outcomes such as well-being and positive emotions, for instance job satisfaction, quality of life, peak

experience, peak performance, and flow, but also negative emotions such as envy, grief over failure, stigma, fear of failure, or even as an addiction, in the case of serial entrepreneurship. Legitimacy strategies have also received a lot of focus with topics such as how entrepreneurs use narrative strategies, persuasive rhetoric, their network as well as acquisition of status, identity, and professionalisation.

Although the review by Shepherd et al. is mainly related to entrepreneurship viewed as new venture creation, it is actually the only review that discusses alternative methods to assess outcomes of initiatives within the field, such as the use of deliberation mapping (see Burgess et al., 2007). Henry et al. (2005) and Hägg & Gabrielsson (2017) echo the other reviews in their call for longitudinal assessment studies with rigorous quantitative methodology. Henry et al. do however also discuss the need for focusing on alumni students when assessing outcomes. Mwasilviba (2010) discusses the differences between impact assessment (prove the effects and later improve) and evaluation (measuring progress and quality), and how different approaches are needed for the two activities (see Hulme, 2000 and Solomon et al., 2002 for a discussion about this).

There is consensus regarding the importance of considering the context, target group and teaching approach when assessing educational initiatives within the field. Similar to the approach advocated by Gibb (1987), much of the focus in the review by Shepherd with colleagues is on the life world of the entrepreneurs and understanding emphatically how they deal with failure, how their professional life is intertwined with their private life, how they learn from co-workers, and how the creation of a new venture is moulded both by the entrepreneurs and their employees, and vice versa.

### *2.3.2. Implications for the EEEPHEIC project*

The categorisation matrixes applied in these reviews remind much of the ones applied in the decennial reviews. There is focus on context, target audience and teaching methods (Mwasilviba, 2010), who/what/how/for whom (Hägg & Gabrielsson, 2017), stages in a venture creation process and the embeddedness of a venture creation process in a context (Shepherd et al., forthcoming). Henry et al. (2005) apply the well-established categorisation *about/for/in* entrepreneurship. Mwasilviba adds *through* entrepreneurship to this category, as he recognises the many educational initiatives that do not focus on entrepreneurial content but apply it more as a teaching approach.

The critical stance by Hägg & Gabrielsson regarding action-oriented teaching methods, and whether they provide valuable learning opportunities rather than just experiences, should be considered when designing the categorisation matrix. It is necessary to pay attention to whether the teaching methods are aligned with

the learning process and designed in a way so that the students can purposefully build on these when engaging in the next assignment and throughout their entrepreneurial process. Is there assigned reflection and learning assignments, or are the activities performed only to provide the students with experiences rather than learning?

The discussion in the review of Mwasilviba is relevant both to the development of a categorisation model and an assessment tool. Hudson and Anderson (2005) state that a set of quality or progress indicators for entrepreneurship education should be 1) relevant to policy makers, they should be 2) valid and able to measure the condition accurately, the indicators should moreover be 3) reliable and consistently used, 4) easy to interpret and understand, and 5) able to provide timely information. Each indicator should be 6) logically connected to other indicators. The discussion in the review by Henry with colleagues about the need to focus on alumni students aligns with this statement and challenges us to consider various frameworks, one for assessing short-term effects, another for assessing long-term outcomes.

Although most of the variables discussed in the review by Shepherd et al. are mostly relevant to education focused on venture creation, their clear focus on the entrepreneur's life world and her coping with and overcoming challenges<sup>3</sup> are interesting variables that have received only little focus in assessment studies. Typically, it is variables such as entrepreneurial intentions, attitudes and self-efficacy that dominate assessment studies. The focus on intentions has received much criticism, since it is questionable whether intentions materialise into action (see Van Gelderen et al., 2015). The broad categories such as students' perceived ability to manage uncertainty, marshal resources, communicate and network, as well as perceptions of entrepreneurship, can be nuanced in order to provide us with more precise information. Such categories can for example be the ability to deal with failure and negative emotions, build and retain legitimacy, balance professional and private life, and entrepreneurial identity. In many ways, the outcomes identified as important in Shepherd et al. fill the "gaps" identified by Nabi et al. (2017).

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<sup>3</sup> These problems have also been discussed extensively by Cope (2005). Cope views the multiple challenges that entrepreneurs are faced with and their connectedness to private life as the foundations for entrepreneurial learning.

### 3. ESTABLISHED TAXONOMIES IN ENTREPRENEURSHIP EDUCATION

The analysis of the literature reviews clearly demonstrated that there is a lack of conceptual clarity within the field. There have been two different strands developing in parallel (Hägg & Gabrielsson, 2017). The foundational roots of the field are to be found in management and it started out with a clear focus on new venture creation (Honig, 2004). As entrepreneurship became recognised as a key driving force behind social and economic transformation, the focus on entrepreneurship education increased (Fayolle et al., 2016; Van Praag & Versloot, 2008). This led to a broadening of its educational focus. Being entrepreneurial or enterprising is viewed as something important to everyone, not just to those who start up ventures. Educational initiatives focusing on fostering entrepreneurial skills and enterprising individuals are today a common component in educational systems in Europe (Jones & Iredale, 2010). However, this broadened scope of focus makes it problematic for educators to design educational offerings. This problem was recognized in the review by Pittaway & Cope (2007), and they called for the creation of taxonomies in the topic, to help guide practitioners.

This call has been adhered. One problem with taxonomies is that they need to be national in order to be aligned with the national education system. This may have as an effect that the concept receives multiple different interpretations. To some degree this is what has happened within the field of entrepreneurship. This problem should however not be overstated. The different national taxonomies that have been developed within the field are general in character, and the overlap and similarities are more common than the dissimilarities. This is well illustrated by the pan-European taxonomy in entrepreneurship “EntreComp”.

In this review, four taxonomies are presented and analysed. Three of these are national (the Austrian Trio-model, the Danish taxonomy, the British QAA framework). The fourth is the pan-European EntreComp. As we will see, the three national taxonomies are all well-aligned with the EntreComp framework.

#### 3.1. The Austrian TRIO-model

The TRIO-model was developed by the Austrian organisation “Initiative for Teaching Entrepreneurship” (Aff & Lindner, 2005). The taxonomy is broad and inclusive. Entrepreneurial competences are divided into three broad categories: 1) *Entrepreneurial Core skills* (being adaptive, innovative and able to start personal projects), 2) *Entrepreneurial Culture* (entrepreneurial thinking and action, open-mindedness, creativity, risk taking, goal setting, initiative and the culture of sustainability), and 3) *Entrepreneurial Civic Education*

(developing new ways of responsibility, citizenship and developing partnerships that are beneficial to oneself, others and the environment). It thus presents entrepreneurship education with a much broader focus than just venture creation.

By dividing the progression of learning goals into six steps (two for Primary level, two for Secondary level, and two for Tertiary level), the taxonomy follows the RQ-framework developed by the European Commission to some degree. The learning progression is divided into learning levels from A1 to C2. Skills descriptions range from "I can creatively develop ideas" to "I can evaluate business risks on the basis of case studies" to "I recognize ethical issues and solve them". Due to this multidimensional fanning, the desired learning success is precisely controlled.

### **3.2. QAA Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers**

The QAA Guidance (2018 update) is a report on what constitutes best practice according to UK Universities and relevant governmental bodies. It updated the 2012 version following a year-long review and feedback. There are several models presented in this report that are described in more detail below.

#### *3.2.1. Learning about, through and in*

Categorising assessment in terms of *learning about*, *learning through* and *learning in (for)* was initially developed by Jamieson (1984). The goal of this framework was to get beyond the evaluation of just knowledge. Pittaway & Edwards (2012) effectively concluded that most assessment was being done in exams and tests, albeit in primarily business school contexts. In essence, the categories can be explained as follows: One can learn to ride a bike by having someone explain it all to you and maybe using simulation techniques or partial experiences (*in/for*), one can be helped and guided whilst on the bike (*through*). This can be contrasted with *learning about*, that is, getting the knowledge about riding a bike. You can probably pass a written test or exam, *but may never be able to ride a bike*.

#### *3.2.2. The gateway triangle*

One key guidance tool in the QAA is the "gateway triangle" which identifies different assessment approaches for enterprise/entrepreneurship education. This ranges from the self (inner world), via the environment/context and self-led negotiated action to entrepreneurial action. The triangle was devised to

explain how learners move from disinterest to becoming aware. They then develop the relevant competences (maybe with simulations or in safe environments) before moving towards external engagement and more uncertain contexts. Once they develop confidence, they move to next stage where their interests and desires come into play. At that point they decide if they wish to become an entrepreneur or use their abilities intrapreneurially. This deliberately disconnects the business-startup side of things until they have the underlying competences. However, students could start at the top of the triangle and, through a process of trial and error, realise what they are missing. This would be the “learning through” approach, such as mentoring or apprenticeships.

### *3.2.3. Progression*

Similar to the EntreComp framework, the QAA defines progression as moving from needing support to having ability and autonomy to do things for yourself. The other dimension is complexity. Tasks should start off as simple and then progress into more complex assignments. This could be done by, for example, changing information part way through an assignment or introducing a factor that they have yet to consider.

This progression is the basis for how the QAA views the entrepreneurial process or journey. Assessment is categories in terms of a continuum that contains mindset, effectiveness, competencies and awareness. In regard to educators this translates into when they need to move from delivery of content (pedagogy) to student-negotiated projects (andragogy) and finally student-led and educator-supported/mentored (heutagogy).

### **3.3. The Danish Entrepreneurship Taxonomy**

The Danish Entrepreneurship Taxonomy was developed by the Danish Foundation for Entrepreneurship. It was developed in collaboration with educators at all levels of education. The taxonomy replaces an earlier progression model (FFE, 2013). The EntreComp framework is heavily inspired by this taxonomy and, among other things, the definition of entrepreneurship proposed by the Danish Foundation for Entrepreneurship was adopted in the EntreComp framework.

“Entrepreneurship is when actions take place on the basis of opportunities and good ideas, and these are translated into value for others. The value thus created can be of an economic, social or cultural nature.” (FFE-YE, 2011).

The Danish taxonomy also provides a definition of entrepreneurship education which is understood as: “Content, methods and activities that support the development of motivation, competence and experience that make it possible to implement, manage and participate in value-creating processes.” (FFE-YE, 2013).

This implies that what is important when designing entrepreneurial education is that it 1) supports the development of students’ entrepreneurial knowledge and skills; 2) supports the development of students’ personal and emotional resources; 3) provides students with experience in applying knowledge, skills and personal resources in value-creating processes; 4) allows students to reflect on, and take a critical and ethical view of, value creation.

The main focus of the taxonomy is on four dimensions, which are identified as being crucial to include when teaching entrepreneurship:

*Action:* Entrepreneurship education is based on students performing activities. In order to be able to take action it is necessary to have an economic understanding, be able to mobilise and marshal resources as well as to manage and be comfortable with uncertainty and ambiguity (Gibb, 2011; Moberg, 2014; Neck, Greene & Brush, 2014; Sarasvathy, 2008).

*Creativity:* Another key element is the development of creativity and divergent thinking, the ability to get ideas, to see and create opportunities and solve problems (Baron, 2012; Dyer, Gregersen, Christensen, 2011; Elsbach, 2003; Lee, Florida & Acs, 2004).

*Outward Orientation:* A third aspect is interaction with the world outside the classroom, by e.g. emphasizing cooperation with various external partners and stakeholders, openness to opportunities in the market, and an empathetic approach to the social and cultural context (Nielsen et al. 2009; Neck, Greene & Brush, 2014).

*Personal Attitude:* Finally, the fourth point concerns students’ faith in their own ability to initiate acts of change, work persistently, accept and learn from others’ and one’s own mistakes and to make ethical assessments and reflections (Blenker et al., 2011; Jones & Iredale, 2010; Sarasvathy & Venkataraman, 2011).

These four dimensions are naturally interconnected. In the model proposed in the taxonomy the *Personal Attitude* overlaps the other three dimensions. This is not because it is more important than the other three, but rather that it is difficult to teach, being linked to personal factors such as identity and subjectivity. At the same time, there is a close relationship between the development of core curricula, the other three dimensions, and personal attitude.

### 3.3.1. Progression

In this taxonomy, progression is equal to an increase in complexity. However, there is much focus on how this complexity is increased based on interaction with the core curricular. It is anticipated that the entrepreneurial activities will increasingly be based on discipline-specific content, and that the students will learn how to transfer specific knowledge into value for others. By developing various and meaningful experience with different forms of value creation, which increase in complexity over time, the learner will acquire both entrepreneurial competences and develop core curricular competences in tandem. This approach to entrepreneurial education is thus understood as being embedded in the curricular, with a focus on the four areas, rather than something taught separately or as a one-off event.

Specific and detailed goals for 1) knowledge, 2) skills, and 3) competences are provided following the national qualifications framework (NQF)<sup>4</sup>. The taxonomy is aligned with the SOLO taxonomy (Biggs & Collins, 1982) in regard to the increase in complexity. However, the progression of the learning goals is also based on Bloom's revised taxonomy (Bloom & Krathwohl, 1956). Analysis, evaluation and creation are thus not considered to be limited to higher education. The differences between the levels is the learning goals' complexity and the students' ability to self-initiate and structure these learning domains.

### **3.4. The EntreComp framework**

The EntreComp framework is described in two main documents: the 'Entrepreneurship Competence Framework (2016) and the user guide 'EntreComp Into Action' (2018).

The legitimacy of the EntreComp framework originates from the fact that the European Union proposed 'sense of initiative and entrepreneurship' as one of the eight key competences for lifelong learning. While member states recognized the importance of entrepreneurship and used the term in their policy documents, there often was neither a commonly agreed-upon definition on the national level nor on the European level. As a result, the Joint Research Centre (JRC) of the European Union was asked by the European Commission's Directorate General for Employment, Social Affairs and Inclusion (DG EMPL) to undertake a study in order to develop a common conceptual approach which would facilitate inter-European policy discussion and ultimately support the development of entrepreneurship competence at a European level.

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<sup>4</sup> The NQFs are based on the Danish Ministry of education's interpretation (Ministry of Education, 2009) of the European Qualification Framework (European Communities, 2008). This framework is divided into eight levels. Level 1 corresponds to the completion of compulsory schooling, Level 7 to the completion of a degree course and Level 8 to the completion of a PhD degree.

The framework was developed in close collaboration with numerous experts within the field and can thus be viewed as a consensus model. It resulted in a framework consisting of 15 conceptually distinctive entrepreneurship competences divided over three thematic areas. These competences are operationalised as detailed learning outcome statements for various levels of education. The three thematic areas are 1) *Ideas and Opportunities*; 2) *Resources* and 3) *Into Action*. Within each competence area there are five individual competences. The table below<sup>5</sup> presents the competence areas and associated competences and their definitions.

Areas	Competences	Hints
<b>1. Ideas and Opportunities</b>	1.1 Spotting opportunities	Use your imagination and abilities to identify opportunities for creating value
	1.2 Creativity	Develop creative and purposeful ideas
	1.3. Vision	Work towards your vision of the future
	1.4 Valuing ideas	Make the most of ideas and opportunities
	1.5 Ethical and sustainable thinking	Assess the consequences and impact of ideas, opportunities and actions
<b>2. Resources</b>	2.1 Self-awareness and self-efficacy	Believe in yourself and keep developing
	2.2 Motivation and perseverance	Stay focused and don't give up
	2.3 Mobilizing resources	Gather and manage the resources you need
	2.4 Financial and economic literacy	Develop financial and economic knowhow
	2.5. Mobilizing others	Inspire, enthuse and get others on board
<b>3. Into action</b>	3.1 Taking the initiative	Go for it
	3.2 Planning and management	Prioritize, organize and follow-up
	3.3 Coping with uncertainty, ambiguity and risk	Make decisions dealing with uncertainty, ambiguity and risk
	3.4 Working with others	Team up, collaborate and network
	3.5. Learning through experience	Learn by doing

**Table 2:** The EntreComp framework.

While the EntreComp framework transcends the boundaries of formal learning and can be applied in other non-formal/informal learning settings, it does constitute competence dimensions generally accepted by entrepreneurship educators, and subsequently acceptable in terms of focus for impact assessment measures.

<sup>5</sup> The table is based on Bacigalupo, M., Kampylis, P., Punie, Y., Van den Brande, G. (2016). *EntreComp: The Entrepreneurship Competence Framework*. Luxembourg: Publication Office of the European Union; EUR 27939 EN; doi:10.2791/593884

#### 4. EXISTING ASSESSMENT TOOLS AND RELATED PROJECTS

Our review of existing assessment tools builds on the contextual knowledge of the consortium members and the expert panel. We have relied heavily on the work performed in the project EntreAssess which had as a goal to identify and present assessment and evaluation tools that are useful to educators focusing on entrepreneurial education. The EntreAssess project, the Entrepreneurial Skills Pass and the SOCCES project, which are projects that have had similar goals as the EEPHEIC project, are presented and discussed below.

##### 4.1. Examples of assessment tools

In connection with the development of the EntreComp framework, reviews of existing assessment tools of entrepreneurship and enterprise education were performed. This was later presented in a structured manner in the EntreAssess project<sup>6</sup>. By reviewing this project and collecting input about the topic from our expert panel, it quickly became clear that there is no lack of assessment tools. However, the majority of the tools are developed for a specific purpose and lack a flexible design. Their use is therefore often limited. In Table 3 below, 24 assessment tools of entrepreneurship education are listed. In the Appendix, a review of these tools and their usability is provided.

ASTE	Berkley Innovation Index	GEM	MIND Cette
OctoSkills	OICAT	GUESS	COLLABORATE
ESP	Get2Test Durham	ETECA	SET
LoopMe	Go Forth	SCALES	ATC21S
MTEE	Valorise Toi	EntreIntent	SOCCES
SKILLOON	Enterprise Catalyst	Entrepreneurial mindset orientation scale	Entrepreneurial mindset index

**Table 3:** Various assessment tools within the field of entrepreneurship education.

##### 4.2. Assessment projects

Three European projects that focus on developing or collating tools for assessing entrepreneurship education have been identified as being of specific importance to the EEPHEIC project. Below, these projects will be presented.

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#### 4.2.1. *EntreAssess*

The purpose of *EntreAssess* is to provide a progression model for assessment in entrepreneurship education built on existing knowledge and experience by suggesting potential applications. The project partners have put together an overview of methods and tools that can be used when assessing outcomes of educational initiatives at different educational levels, with a specific focus on entrepreneurial education (that is, both entrepreneurship and enterprise education). They have also collated various examples of how this can be done.

The material is structured in what they call *the EntreAssess journey* which can be applied in order to assist the development and progression in using assessment to inform learning. It is anticipated that a higher degree of sophistication and inclusion of collaborators and stakeholders will increase as the focus on assessment increases. There are four steps included in the *EntreAssess* journey: 1) Self-assess which dimensions to focus on, 2) How to progress, 3) Find assessment tools and methods appropriate to level and dimension, and 4) Implementation pathway.

In the first step the educator should self-assess which level he/she is at in six dimensions: the *what, how, when, where, who* and *why* of entrepreneurial learning. The next step is to understand how to progress and develop, that is, which next steps to take to improve and enhance the use of purposeful assessment practices. The third step is to decide which set of assessment methods and tools to use based on the ones suggested by the tool. The fourth step is to continue on the assessment pathway and bring the surrounding environment forward, which entails the inclusion of additional collaborators and stakeholders, i.e. to take steps towards establishing an assessment community.

The main message that the partners in *EntreAssess* want to convey is that assessment practice is context specific and needs practice in order to fulfil its purpose which is to inform learning, that is, what learners should be learning next and how to steer the learning forward. In order to function efficiently, the assessment methods used should mirror the six dimensions the *what, how, when, where, who* and *why* of entrepreneurial learning. It should thus increase in sophistication and involve multiple collaborators and stakeholders, as it progress and moves on along the journey.

The overview of methods, tools and examples presented at the website of the project is naturally very useful when developing an assessment tool as the one in the EEPHEIC project. In addition to this, they underline the importance of providing a flexible tool that can be made context specific and should be considered in order to make it useful to a broad target audience.

#### 4.2.2. *The Entrepreneurial Skills Pass (ESP)*

When developing the ESP, the focus was on developing a certification model for students who have participated in JA Company Programme<sup>7</sup>. In order to be eligible for the certification process, it is necessary to participate in a one-year experiential entrepreneurship programme (JA Company Programme). Seven entrepreneurial soft skills 1) Creativity, 2) Teamwork, 3) Perseverance, 4) Resourcefulness, 5) Self-confidence, 6) Taking Initiative, and 7) Taking responsibility are assessed with self-reported pre/post tests. In addition to this, the eight key competences identified by the European commission, i.e. 1) Communicate in a foreign language, 2) Entrepreneurial competence, 3) Mathematic and Science competence, 4) Social and communication competence, 5) Digital competence, 6) Communication in mother tongue, 7) Cultural awareness, and 8) Learning to learn are assessed with the same method. This approach is similar to many other projects, for example ASTEE<sup>8</sup>.

What makes ESP unique compared to other approaches is its focus on testing and assessing declarative entrepreneurial knowledge. A test which randomly draws 28 questions from a pool of 130 questions is used to assess this. These questions cover four areas: 1) General Understanding of Organisations (Entrepreneurship; Vision, mission and ethics; structure; leadership, competence in a team; value of ICT; personal development), 2) Main Steps & Legal Requirements (Business life cycle, starting up, operating, liquidation, IPR), 3) From Idea Generation to the Market (Idea generation, business opportunity, kinds of innovation, market research, selling strategies, marketing strategies, internationalization, business plan), 4) Financial Resources and Budgeting (Funding opportunities, costing and pricing, budget and financial analyses, key terminology). These four areas are aligned to the intended learning outcomes of Junior achievement's entrepreneurship programme "Company Programme".

Although Junior Achievement has a strong focus on venture creation in their programmes and the test in ESP is focused on venture creation skills, there is also a strong focus on employability. A network of industry organisations is connected to ESP and the certificate's intended use is to signal to potential employers that these students have acquired important entrepreneurial competences.

##### 4.2.2.1. *JA Worldwide meta-study*

In connection with the development of ESP, the business partner Accenture performed a global meta-analysis of 1) *workforce readiness*, 2) *entrepreneurship* and 3) *financial literacy*. They assessed these categories'

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<sup>7</sup> <http://ja-ye.org/>

<sup>8</sup> <https://eng.ffe-ye.dk/media/789196/astee-report-rev.pdf>

influence and “malleability” at different levels of education. This is an ambitious project in which the authors set out to summarise the research on the three categories that Junior Achievement focuses on in their programmes. The overlap for these categories is significant, and the method of analysis chosen by Accenture creates a high level of redundancy, so, in this review we will only focus on the *entrepreneurship* category.

The framework presented is highly detailed. The authors align how entrepreneurship education can impact various entrepreneurial soft skills and which outcomes this may have on society, the individual and the interaction between the two. In doing this, it outlines which dimensions are important to focus on in education, how this fosters certain soft skills, and the importance of these skills in society and on the labour market. However, Accenture takes this a step further and identifies categories of soft skills as well as at which age these skills are most effectively fostered. In the tables below, an overview of the soft skill categories and an overview of the competences’ malleability, divided by age groups, is presented.

<b>Programme dimensions*</b>	<b>Individual soft skills</b>
Connection to real life <ul style="list-style-type: none"> <li>- Agreeableness</li> <li>- Diligence</li> <li>- Resilience</li> </ul>	Positive self-concept <ul style="list-style-type: none"> <li>- Resilience</li> <li>- Openness to Experience</li> <li>- Extraversion</li> </ul>
Work-readiness skills <ul style="list-style-type: none"> <li>- Higher-order Thinking Skills</li> <li>- Work Ethics/Conscientiousness</li> <li>- Agreeableness</li> <li>- Communication</li> <li>- Openness to Experience</li> </ul>	Future orientation <ul style="list-style-type: none"> <li>- Goal-orientation</li> <li>- Resilience</li> </ul>
School engagement <ul style="list-style-type: none"> <li>- Goal-orientation</li> <li>- Teamwork</li> <li>- Agreeableness</li> <li>- Extraversion</li> <li>- Work Ethics/Conscientiousness</li> </ul>	Locus of control <ul style="list-style-type: none"> <li>- Goal-orientation</li> <li>- Diligence</li> </ul>
Professional skills <ul style="list-style-type: none"> <li>- Work Ethics/Conscientiousness</li> <li>- Leadership</li> <li>- Higher-order Thinking Skills</li> <li>- Diligence</li> <li>- Teamwork</li> <li>- Communication</li> </ul>	Self-efficacy <ul style="list-style-type: none"> <li>- Resilience</li> <li>- Openness to Experience</li> </ul>
Entrepreneurship knowledge	Goal setting <ul style="list-style-type: none"> <li>- Goal-orientation</li> <li>- Diligence</li> </ul>

\*The categorisation comes directly from the JA Worldwide meta-analysis, but the category labels are made by the author of this report.

**Table 4:** Soft skills areas and the competences they include

Soft Enabler	Malleability (L = Low, H = High, M= Medium, N = Not Applicable)			
	Early Childhood Age: 7-11	Middle Childhood Age 12-14	Age: 15-18	Age: 19-29
Goal Orientation	L	M	H	H
Leadership	L	L	H	H
Resilience	M	M	H	H
Diligence	M	H	L	L
Higher-order Thinking Skills	L	M	H	N
Teamwork	L	L	H	N
Openness to Experience	M	H	H	H
Work Ethics/Conscientiousness	L	M	H	M
Agreeableness	L	H	M	L
Communication	H	H	L	N
Extraversion	M	H	H	N
Adaptability	H	H	M	L
Self-confidence	M	H	H	L

**Table 5:** The malleability level of the soft skills in regard to age.

The categorisation shows that the sub-categories overlap significantly. This demonstrates the complexity of mapping soft skills, but it also raises some concerns in regard to the simplified categorisation applied in the study. An example of this is that the categories “Locus of control” and “Goal setting”. These categories have the same sub-categories “Goal-orientation” and “Diligence”. Naturally, the two categories are interconnected, since it would make little sense to set goals if you believe that you have little control over actions in your life, that is, if you have a high level of external locus of control. However, the belief whether you can influence outcomes in your life extends widely beyond whether you set goals in your life. It can also be viewed as somewhat peculiar that work ethics and conscientiousness are lumped together into a single category, since they clearly are different dimensions conceptually.

In addition to the lack of conceptual clarity, the choice of categories to include can also be questioned. Many researchers as well as educators would include “creativity” as an important soft skill in entrepreneurship. The difficult task of identifying and categorising soft skills sheds light on the reason why behavioural economists traditionally have avoided measuring them. Often these types of skills have instead been regarded as a residual of other more measurable variables, such as cognitive skills (which are often measured by means of standardised tests or IQ tests, see Koch et al., 2015 for a discussion about this). This complexity and the lack of predictive validity it entails, has led researchers such as Judge et al. (2003) to develop composite measures which include multiple soft skills. An example of this is the “Core self-evaluation” scale. Perhaps this would be a method to consider when assessing entrepreneurial soft skills.

The framework of age levels when these soft skills are most effectively fostered, or rather when their level of malleability is the highest, is important to consider when designing an assessment tool. Since the focus of the EEPHEIC project is on tertiary level, it is the age group 19-29 that is of interest. The table above lists the soft skills that educational initiatives at this level should focus on. Other than controlling for the influence that the other soft skills might have either on how the student interacts with the educational initiative or on how this affects other outcomes, it makes little sense to include variables with low or no level of malleability in an assessment. If we were to follow the suggestions of this framework, we should focus on measuring “Goal orientation”, “Leadership”, and “Resilience”, while avoiding “Extraversion”, “Higher order thinking skills”, “Communication” and “Teamwork” altogether. Not many educators at this level would agree with this categorisation. While the two former of the categories that should be avoided can be argued to be “set” at this age, it is questionable why communication and teamwork would not be skills that can be taught to this age group. However, this way of categorising soft skills offers us an interesting perspective of what our tool should measure in order to offer information to our target group. It should thus be considered when designing it.

The ESP also provides us with interesting insights regarding the design of the tool. The emphasis on connecting certification with specific educational experience is important. The testing of entrepreneurial knowledge should also be viewed through this lens. Naturally, it is important to align a test of knowledge with the educational learning goals of the programme. The testing of entrepreneurial knowledge in a structured, valid and reliable way is what makes this project unique. Nevertheless, it can be questioned whether this feature is of value to our target group. Assessing knowledge is something educational institutions are traditionally good at. Most educators also have the knowledge to align this assessment with their learning goals. In addition to this, it can be questioned whether it is possible to construct a standardised test that efficiently will cover all the various learning goals of our target group. This type of test can be viewed as being more useful when comparing the influence of different educational initiatives similar to PISA, which is not the intended use of the tool developed in the EEPHEIC project.

#### *4.2.3. The SOCCCESS project*

The goal of the SOCCCESS project was to develop a tool called EuroComPass. This tool is dedicated to the assessment of entrepreneurial competences through a modular method using quantitative standardized tests and qualitative methods. It is proposed to be used in a one-time session, supervised by entitled certification bodies. The authors of the report present various approaches to assessment and align these

with the three overarching approaches: behaviourism, cognitivism and constructivism (Terzieva et al., 2015). They outline the strengths and weaknesses within each of these approaches and conclude that in order to leverage the approaches' strengths and minimise their weaknesses, varied assessment methods, which are authentic and contextualised, should be used. In addition to this, it is beneficial if the assessment is student-centred and integrated with the learning process (Segers et al., 2003).

Eight competences have been identified as being important entrepreneurial competences. These competences are divided into four conceptual categories. In Table 6 an overview of the framework is presented.

<b>Dimension</b>	<b>Proposed tools for assessment</b>
1) Positive attitude and initiative	
- Self-assessment	Adapted version of the empowerment scale by Rogers et al. (1997)
- Growth mindset	The brief Mindset scale by Dweck (2006)
- Perseverance and coping strategies	Perseverance by the perseverance scale by Kyndt & Baert (2015), coping strategy the planning for future scale developed by Kyndt and Baert (2015)
Communication and interaction	
- General Communication and Presentation	A speech about the "importance of perseverance and coping strategy in my life"
Persuasion	The Ability to persuade scale developed by Kyndt and Baert (2015), used both as self-assessment and evaluator-assessment
Interaction	A shortened version the Interpersonal Communication Competence Scale developed by Rubin and Martin (1994). A narrative about the student's interaction competences listing strengths, weaknesses, and whether and how it is possible to improve these competences.
Creativity	
- Creativity and lateral thinking	The Creative problem-solving scale – Producing creative solutions scale (Morris et al., 2013). A 15-minute creativity exercise, imagining how many uses that can be imagine for a shoe.
Critical and analytical thinking	
- Recognizing opportunities	The opportunity recognition scale developed by Morris et al. (2013). A presentation of how to commercialise the best idea in the creativity exercise.

Table 6: Categorisation of entrepreneurial competences in the SOCCCESS project.

The strength of the tool developed in the SOCCCESS project is the use of different assessment methods and the ways these connect to each other. Assignments that include presentations always link back to earlier self-assessments or exercises. The categories are well-defined and described in a manner which is easy to understand for educators and students. However, some of the categories can be considered as being somewhat underdeveloped considering the goal to align with the EntreComp framework. The fact that the “Critical and analytical thinking” category only includes “Recognising opportunities” can be questioned. This category could also include EntreComp competences such as “Valuing ideas” and “Ethical and sustainable thinking”. Other dimensions, such as “Perseverance” and “Coping strategies”, can be questioned in regard to their dimensionality since “Perseverance” and “Coping strategies” are clearly different categories conceptually. This is also recognised by the tool’s developers by the fact that they are assessed with different tests.

The validity of some of the scales included in the tool can also be questioned. The Morris et al. (2013) scale has for example not undergone any validity tests, only dimensionality tests based on 40 respondents. The Rubin and Martin (1994) scale includes items that can be difficult for respondents to comprehend such as “I don’t know exactly what others are feeling” and “My communication is usually descriptive, not evaluative”.

The designers of the SOCCCESS tool have nevertheless identified many measures and scales that are well-aligned with entrepreneurial dimensions and that have the potential to greatly inform educators who want to assess how their educational initiatives influence their students. Since the tool relies heavily on scales developed by Morris et al. (2013) and Kyndt and Baert (2015), these will be reviewed separately below.

#### *4.2.3.1. Morris et al. (2013) Entrepreneurial competence scale*

Morris with colleagues (2013) performed a multistep Delphi study in which 20 experienced entrepreneurs (who had funded companies with 100+ employees) and 20 experienced entrepreneurship educators independently assessed which competences were of special importance to entrepreneurs rather than of general importance to all business managers. This resulted in 13 identified competences: 1) Opportunity recognition, 2) Opportunity assessment, 3) Risk management/mitigation, 4) Conveying a compelling vision, 5) Tenacity/Perseverance, 6) Creative problem-solving/ Imaginativeness, 7)

Resource leveraging, 8) Guerrilla skills, 9) Value creation, 10) Maintaining focus yet adapting, 11) Resilience, 12) Self-efficacy, 13) Building and using networks.

Each category is defined and described in a way that makes them understandable to teachers and students. The scale has only been tested on 40 entrepreneurship students. No real validity tests, such as known group analysis or nomological tests, were performed - only tests of dimensionality. The analysis demonstrated that the conceptual dimensions split up into 26 dimensions. The measures presented in this paper can thus not be considered as validated and reliable. However, the conceptual framework, and how this was generated, was based on a rigorous methodology, so if the measures were to be tested properly, they would have potential to be used as assessment of entrepreneurship education.

#### *4.2.3.2. Kyndt and Baert's (2015) Entrepreneurial competencies scale*

Kyndt and Baert's (2015) scale development is based on a large-scale survey (including 34,948 aspiring entrepreneurs in Belgium). They tested the dimensionality and validity of the scale that includes 12 dimensions: 1) Perseverance, 2) Self-knowledge, 3) Orientation towards learning, 4) Awareness of potential returns on investment, 5) Decisiveness, 6) Planning for the future, 7) Independence, 8) Ability to persuade, 9) Building networks, 10) Seeing opportunities, 11) Insight into the market, 12) Socially & environmentally conscious conduct.

The scale was developed over three years in collaboration with entrepreneurs and three entrepreneurship supporting organisations (see Baert & Camertijn, 2007). The pilot version was tested through cognitive interviews with up to twelve entrepreneurs and, subsequently, 1,222 participants completed the pilot version of the questionnaire.

Dimensionality and statistical properties, such as convergent and divergent validity and factorial invariance, were sufficient. The predictive validity was tested by comparing mean differences between aspiring and experienced entrepreneurs. The experienced entrepreneurs demonstrated significantly higher levels in the dimensions, but the effect sizes were very small. These tests thus demonstrate, at best, limited support for the predictive validity of the scale.

In addition to these large-scale tests, they also followed up on a subgroup of respondents (3,239) 3-5 years after they assessed their confidence in entrepreneurial competences. In addition to the competences, the participants had also assessed their level of entrepreneurial intentions and entrepreneurial activities. The analysis demonstrated that out of the 12 competences, only “Perseverance” and “Insight into the market” significantly predicted whether the participants were still active as entrepreneurs. Both entrepreneurial intentions and experience with entrepreneurial activities positively predicted entrepreneurial activities.

Even if the predictive validity of these measures may be limited, they do demonstrate sufficient statistical properties regarding dimensionality. They should thus be considered for inclusion in an assessment tool of entrepreneurship education as an option to educators who want to assess the influence on these specific dimensions.

## 5. SUMMARY

This review of the academic literature, taxonomies, and tools clearly shows that entrepreneurship is a multifaceted phenomenon. A categorisation model and an assessment tool thus need to reflect this by being flexible and cater to the needs of a broad target group. The clearest example of this is the different needs of educators focusing on fostering enterprising skills compared to educators focusing on teaching new venture creation. However, it is also clear that the field is moving towards consensus in regard to the kind of competences that are perceived as important when engaging in entrepreneurial activities. Many of the conceptual frameworks and assessment tools focused on similar competences, and there is a significant overlap in regard to thematic areas. The creation of EntreComp is a clear example of consensus being reached within the field.

The review also clearly demonstrated that it is important to use mixed methods when assessing the influence of entrepreneurship education. In addition to this, it showed that many practitioners as well as researchers requested assessment studies to focus on alumni students. However, this request is not mirrored in the available assessment tools. The majority of the tools and the assessment studies focus on assessing short-term effects.

Moving forward, it will thus be important to tailor assessment tools to specific target groups. The challenge when designing assessment tools is, however, that the more specifically they are tailored to a particular target group, the less useful they will be to other users. A balance, where the tool is flexible and user-friendly, but at the same time specific enough for certain target groups, thus needs to be found. Figuring out how this can be done, and how the tool at the same time can provide its users with timely and actionable feedback, will be a challenge that needs to be addressed by anyone who wishes to develop the next generation of assessment tools within the field.

## REFERENCE LIST

- Adachi, T., & Hisada, T. 2017. Gender Gap in Start-up Activities. *Small Business Economics*, Forthcoming
- Aff, J. & Lindner, J. 2005. Entrepreneurship Education zwischen "small and big ideas" – Markierung einer Entrepreneurship Education an wirtschaftsberuflichen Vollzeitschule, in: Aff, J./Hahn, A. (Hrsg.), Studienverlag Innsbruck, 83-138.
- Aldrich, H. E. 2012. The emergence of entrepreneurship as an academic field: A personal essay on institutional entrepreneurship. *Research Policy*, 41(7): 1240-1248.
- Amit, R., MacCrimmon, K. R., Zietsma, C., & Oesch, J. M. 2001. Does money matter?: Wealth attainment as the motive for initiating growth-oriented technology ventures. *Journal of Business Venturing*, 16(2): 119-143.
- Ardichvili, A., Cardozo, R., & Ray, S. 2003. A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing*, 18(1): 105-123.
- Bacigalupo, M., Kampylis, P., Punie, Y. & Van den Brande, G. 2016. *EntreComp: The Entrepreneurship Competence Framework*. JRC Science for Policy Report.
- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. 2014. The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship Theory and Practice*, 38(2): 217–254.
- Baert, H. & Camertijn, C. (2007). *Zelfbeoordeling van Ondernemerscompetenties in een Competentiegericht Ontwikkelingstraject: de ENTRE-Spiegel*. Paper presented at Onderwijs Research Dagen 2007. Groningen, The Netherlands.
- Baker, T & Nelson, R.E. 2005. Creating Something from Nothing: Resource Construction through Entrepreneurial Bricolage. *Administrative Science Quarterly*, 50, 329-366.
- Bakker, R. M., & Shepherd, D. A. 2017. Pull the plug or take the plunge: Multiple opportunities and the speed of venturing decisions in the Australian mining industry. *Academy of Management Journal*, 60(1): 130-155.
- Bammens, Y., & Collewaert, V. 2014. Trust between entrepreneurs and angel investors: Exploring positive and negative implications for venture performance assessments. *Journal of Management*, 40(7): 1980-2008.
- Baptista, R., & Naia, A. 2015. Entrepreneurship education: A selective examination of the literature. *Foundations and Trends in Entrepreneurship*, 11(5): 337–426.
- Baron, R. A. 2008. The role of affect in the entrepreneurial process. *Academy of Management Review*, 33(2): 328-340.
- Baron, R. A., Franklin, R. J., & Hmieleski, K. M. 2016. Why entrepreneurs often experience low, not high, levels of stress: The joint effects of selection and psychological capital. *Journal of Management*, 42(3): 742-768.
- Baron, R. A., Mueller, B. A., & Wolfe, M. T. 2016. Self-efficacy and entrepreneurs' adoption of unattainable goals: The restraining effects of self-control. *Journal of Business Venturing*, 31(1): 55-71.
- Barrow, C. and Brown, R. (1996), "Training to help small businesses grow", *Proceedings of the 19th Institute of Small Business Affairs – National Small Firms Conference*, Birmingham, pp. 1062-78.
- Bechard, J. P., & Gregoire, D. 2005. Understanding teaching ´ models in entrepreneurship for higher education. In P. Kyrö, & C. Carrier (Eds.), *The dynamics of learning entrepreneurship in a cross-cultural university context*: 104–134. Tampere, Finland: Faculty of Education, University of Tampere.
- Bechard, J. P., & Gregoire, D. 2007. Archetypes of pedagogical ´ innovation for entrepreneurship education: Model and illustrations. In A. Fayolle (Ed.), *Handbook of research in entrepreneurship education*: Vol. 1: 261–284. Cheltenham, UK: Edward Elgar Publishing.
- Becker-Blease, J. R., & Sohl, J. E. 2015. New venture legitimacy: the conditions for angel investors. *Small Business Economics*, 45(4): 735-749.
- Behrens, J., & Patzelt, H. 2016. Corporate Entrepreneurship Managers' Project Terminations: Integrating Portfolio-Level, Individual-Level, and Firm-Level Effects. *Entrepreneurship Theory and Practice*, 40(4): 815-842.
- Belfield, C.R. (1999), *The behaviour of graduates in the SME labour market: Evidence and perceptions*, *Small Business Economics*, 12(3), 249.
- Bernhofer, L., & Han, Z. 2014. Contextual factors and their effects on future entrepreneurs in China: A comparative study of entrepreneurial intentions. *International Journal of Technology Management*, 65(1-2-3-4): 125–150.
- Biniari, M. G. 2012. The emotional embeddedness of corporate entrepreneurship: the case of envy. *Entrepreneurship Theory and Practice*, 36(1): 141-170.
- Birley, S. and Gibb, A. (1984), *Teaching small business management in the UK part I*, *Journal of European Industrial Training*, 8(4), 17.
- Block, Z., & Stumpf, S. A. 1992. Entrepreneurship education research: Experience and challenge. In D. L. Sexton, & J. D. Kasarda (Eds.), *The state-of-the-art of entrepreneurship*: 17–42. Boston, MA: PWS-Kent Publishing Company.
- Boling, J. R., Pieper, T. M., & Covin, J. G. 2016. CEO tenure and entrepreneurial orientation within family and nonfamily firms. *Entrepreneurship Theory and Practice*, 40(4): 891- 913.

- Bosma, N., Acs, Z. J., Autio, E., Coduras, A., & Levine, J. 2008. 2008 Global Entrepreneurship Monitor Executive Report. Wellesley, MA & London.
- Boukamcha, F. 2015. Impact of training on entrepreneurial intention: An interactive cognitive perspective. *European Business Review*, 27(6): 593–616.
- Brindley, C. and Ritchie, B. (2000), Undergraduates and small and medium-sized enterprises: Opportunities for a symbiotic partnership? *Education & Training*, 42 (8/9).
- Brana, S. 2013. Microcredit: an answer to the gender problem in funding? *Small Business Economics*, 40(1): 87-100.
- Brazeal, D. and Herbert, T.T. (1999), "The genesis of entrepreneurship", *Entrepreneurship Theory and Practice*, Vol. 23 No. 3, pp. 29-45.
- Brenkert, G. G. 2009. Innovation, rule breaking and the ethics of entrepreneurship. *Journal of Business Venturing*, 24(5): 448-464.
- Breugst, N., Domurath, A., Patzelt, H., & Klaukien, A. 2012. Perceptions of entrepreneurial passion and employees' commitment to entrepreneurial ventures. *Entrepreneurship Theory and Practice*, 36(1): 171-192.
- Breugst, N., & Shepherd, D. A. 2017. If You Fight With Me, I'll Get Mad! A Social Model of Entrepreneurial Affect. *Entrepreneurship Theory and Practice*, 41(3): 379-418.
- Bruneel et al., 2010
- Bridge, S., O'Neill, K. and Cromie, S. (1998), *Understanding Enterprise, Entrepreneurship & Small Business*, Macmillan Publishing, Basingstoke.
- Brown, R. 1990. Encouraging enterprise: Britain's graduate enterprise program. *Journal of Small Business Management*, 28(4): 71-77.
- Bruns, V., Holland, D. V., Shepherd, D. A., & Wiklund, J. 2008. The role of human capital in loan officers' decision policies. *Entrepreneurship Theory and Practice*, 32(3): 485-506.
- Bruyat, C. and Julien, P.A. (2000), "Defining the field of research in entrepreneurship", *Journal of Business Venturing*, Vol. 16 No. 2, pp. 165-80.
- Bucar, B., Glas, M., & Hisrich, R. D. 2003. Ethics and entrepreneurs: An international comparative study. *Journal of Business Venturing*, 18(2): 261-281.
- Bullough, A., de Luque, M. S., Abdelzaher, D., & Heim, W. 2015. Developing women leaders through entrepreneurship education and training. *The Academy of Management Perspectives*, 29(2): 250-270.
- Bullough, A., Renko, M., & Abdelzaher, D. 2017. Women's Business Ownership: Operating Within the Context of Institutional and In-Group Collectivism. *Journal of Management*, 43(7): 2037-2064.
- Bullough, A., Renko, M., & Myatt, T. 2014. Danger zone entrepreneurs: The importance of resilience and self-efficacy for entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 38(3): 473-499.
- Burmeister, K., & Schade, C. 2007. Are entrepreneurs' decisions more biased? An experimental investigation of the susceptibility to status quo bias. *Journal of Business Venturing*, 22(3): 340-362.
- Burrows, K., & Wragg, N. 2013. Introducing enterprise. Research into the practical aspects of introducing innovative enterprise schemes as extra curricula activities in higher education. *Higher Education. Skills and Work-Based Learning*, 3(3): 168–179.
- Byrne, J., Fayolle, A., & Toutain, O. 2014. Entrepreneurship Education: what we know and what we need to know. In E. Chell & M. Karatas-Özkan (Eds.), *Handbook of Research on Small Business and Entrepreneurship* (pp. 261-288). Cheltenham, UK: Edward Elgar.
- Byrne, O., & Shepherd, D. A. 2015. Different strokes for different folks: Entrepreneurial narratives of emotion, cognition, and making sense of business failure. *Entrepreneurship Theory and Practice*, 39(2): 375-405.
- Bygrave, W.D. (1989), "The entrepreneurship paradigm (II): chaos and catastrophes among quantum jumps", *Entrepreneurship Theory and Practice*, Vol. 14 No. 2, p. 30.
- Bönte, W., & Piegeler, M. 2013. Gender gap in latent and nascent entrepreneurship: driven by competitiveness. *Small Business Economics*, 41(4): 961-987.
- Cabral, S., Lazzarini, S. G., & Azevedo, P. F. 2013. Private entrepreneurs in public services: A longitudinal examination of outsourcing and statization of prisons. *Strategic Entrepreneurship Journal*, 7(1): 6-25.
- Cacciotti, G., Hayton, J. C., Mitchell, J. R., & Giazitzoglu, A. 2016. A reconceptualization of fear of failure in entrepreneurship. *Journal of Business Venturing*, 31(3): 302-325.
- Carayannis, E., Evans, D. and Hanson, M. (2003), A cross-cultural learning strategy for entrepreneurship education: outline of key concepts and lessons learned from a comparative study of entrepreneurship students in France and the US, *Technovation*, 23 (9), 757.
- Cardon, M. S., Foo, M., Shepherd, D., & Wiklund, J. 2012. Exploring the heart: Entrepreneurial emotion is a hot topic. *Entrepreneurship Theory and Practice*, 36(1): 1–10.
- Carson, D.J. (1985), The challenge of teaching marketing to small businesses, *European Journal of Marketing*, 19(5), 42.

- Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. 2009. The nature and experience of entrepreneurial passion. *Academy of Management Review*, 34(3): 511–532.
- Cardon, M. S., Post, C., & Forster, W. R. 2017. Team entrepreneurial passion: Its emergence and influence in new venture teams. *Academy of Management Review*, 42(2): 283-305.
- Carter, N. M., Gartner, W. B., Shaver, K. G., & Gatewood, E. J. 2003. The career reasons of nascent entrepreneurs. *Journal of Business Venturing*, 18(1): 13-39.
- Cassar, G. 2010. Are individuals entering self-employment overly optimistic? an empirical test of plans and projections on nascent entrepreneur expectations *Strategic Management Journal*, 31(8): 822-840.
- Cassar, G., & Craig, J. 2009. An investigation of hindsight bias in nascent venture activity. *Journal of Business Venturing*, 24(2): 149-164.
- Cassar, G., & Friedman, H. 2009. Does Self-Efficacy Affect Entrepreneurial Investment? *Strategic Entrepreneurship Journal*, 3: 241–260.
- Chamard, J. 1989. Public Education: Its effect on entrepreneurial characteristics, *JSBE*, 6(2), 23-30.
- Chan, K.C. and Anderson, G.C. (1994), *Academia - industry fusion: action learning for teaching enterprise*, *Industrial and Commercial Training*, 26(4), 28.
- Chan, C. S. R., & Park, H. D. 2015. How images and color in business plans influence venture investment screening decisions. *Journal of Business Venturing*, 30(5): 732-748.
- Chang, J. Y. C., Benamraoui, A., & Rieple, A. 2014. Stimulating learning about social entrepreneurship through income generation projects. *International Journal of Entrepreneurial Behaviour & Research*, 20(5): 417–437.
- Chang, J., & Rieple, A. 2013. Assessing students' entrepreneurial skills development in live projects. *Journal of Small Business and Enterprise Development*, 20(1): 225–241.
- Clouse, V.G.H. (1990), A controlled experiment relating entrepreneurial education to students' start-up decisions, *Journal of Small Business Management*, 28(2), 45.
- Clark, R.W., Davis, C.H. and Harnish, V.C. (1984), “Do courses in entrepreneurship aid in new venture creation?”, *Journal of Small Business Management*, Vol. 22 No. 2, pp. 26-31.
- Clarke, J. 2011. Revitalizing entrepreneurship: how visual symbols are used in entrepreneurial performances. *Journal of Management Studies*, 48(6): 1365-1391.
- Collewaert, V., Anseel, F., Crommelinck, M., De Beuckelaer, A., & Vermeire, J. 2016. When passion fades: disentangling the temporal dynamics of entrepreneurial passion for founding. *Journal of Management Studies*, 53(6): 966-995.
- Collewaert, V., & Fassin, Y. 2013. Conflicts between entrepreneurs and investors: the impact of perceived unethical behavior. *Small Business Economics*, 40(3): 635-649.
- Collewaert, V., & Sapienza, H. J. 2016. How does angel investor–entrepreneur conflict affect venture innovation? It depends. *Entrepreneurship Theory and Practice*, 40(3): 573-597.
- Collins, J. D., McMullen, J. S., & Reutzell, C. R. 2016. Distributive justice, corruption, and entrepreneurial behavior. *Small Business Economics*, 47(4): 981-1006.
- Cope, J. 2005. Toward a dynamic learning perspective of entrepreneurship. *Entrepreneurship Theory and Practice* 29(4), 373-97.
- Cope, J. 2011. Entrepreneurial learning from failure: An interpretative phenomenological analysis. *Journal of Business Venturing*, 26(6): 604-623.
- Cornelissen & Clarke, 2010;
- Cope, J., & Watts, G. 2000. Learning by doing—an exploration of experience, critical incidents and reflection in entrepreneurial learning. *International Journal of Entrepreneurial Behaviour & Research*, 6(3): 104-124.
- Cowling, M., & Taylor, M. 2001. Entrepreneurial women and men: two different species? *Small Business Economics*, 16(3): 167-175.
- Cox, L.W. (1996), “The goals and impact of educational interventions in the early stages of entrepreneur career development”, *Proceedings of the Internationalising Entrepreneurship Education and Training Conference*, Arnhem.
- Crane, F. G. 2014. Measuring and enhancing dispositional optimism and entrepreneurial intent in the entrepreneurial classroom: An Bahamian study. *Journal of the Academy of Business Education*, 15: 94–104.
- Crane, F., & Meyer, M. 2007. Teaching dispositional optimism in the entrepreneurial classroom. *International Journal of Entrepreneurship Education*, 5: 163–174.
- Dainow, R. 1986. Training and education of entrepreneurs: The current state of the literature, *JSBE*, 3(4), 10-23.
- Croidieu, G., & Kim, P. H. 2017. Labor of Love. *Administrative Science Quarterly*: In press. 10.1177/0001839216686531.

- Cumming, D., & Dai, N. 2013. Why do entrepreneurs switch lead venture capitalists? *Entrepreneurship Theory and Practice*, 37(5): 999-1017.
- Curran, J., & Stanworth, J. 1989. Education and training for enterprise: problems of classification, evaluation, policy and research. *International Small Business Journal*, 7(2): 11-22.
- Daly, S., (2001), Student-operated Internet businesses: true experiential learning in entrepreneurship and retail management, *Journal of Marketing Education*, 23(3), 204
- Dana, L.P. 1987. Towards a skills model for entrepreneurs, *JSBE*, 5(1), 27-31.
- Dana, L.P. (1992), Entrepreneurial education in Europe, *Journal of Education for Business* 68(2), 74.
- Dane, E., & Pratt, M. G. 2007. Exploring intuition and its role in managerial decision making. *Academy of Management Review*, 32(1): 33-54.
- Daniel, A. D. (2016). Fostering an entrepreneurial mindset by using a design thinking approach in entrepreneurship education. *Industry and Higher Education*, 30(3), 215-223.
- Davidsson, P. 2004. *Researching entrepreneurship*. Springer.
- Davidsson, P., & Gordon, S. R. 2016. Much ado about nothing? The surprising persistence of nascent entrepreneurs through macroeconomic crisis. *Entrepreneurship Theory and Practice*, 40(4): 915-941.
- Dawson, C. 2017. Financial optimism and entrepreneurial satisfaction. *Strategic Entrepreneurship Journal*, 11(2): 171-194.
- Dean, T. J., & McMullen, J. S. 2007. Towards a theory of sustainable entrepreneurship. *Journal of Business Venturing*, 22(1): 119-145.
- De Carolis, D. M., & Saporito, P. 2006. Social capital, cognition, and entrepreneurial opportunities: A theoretical framework. *Entrepreneurship Theory and Practice*, 30(1): 41- 56
- De Clercq, D., & Rangarajan, D. 2008. The role of perceived relational support in entrepreneur–customer dyads. *Entrepreneurship Theory and Practice*, 32(4): 659-683.
- Delmar, F., & Wiklund, J. 2008. The effect of small business managers' growth motivation on firm growth: A longitudinal study. *Entrepreneurship Theory and Practice*, 32(3): 437-457.
- DeMartino, R., and Barbato, R., (2003), Differences between women and men MBA entrepreneurs: Exploring family flexibility and wealth creation as career motivators, *Journal of Business Venturing*, 18(6), 815.
- DeTienne, D., Shepherd, D. A., & DeCastro, J. 2008. The fallacy of only the strong survive: The effects of extrinsic motivation on the persistence decisions for under-performing firms. *Journal of Business Venturing*, 23(5): 528-546.
- DeTienne, D. R., & Chandler, G. N. 2007. The role of gender in opportunity identification. *Entrepreneurship Theory and Practice*, 31(3): 365-386.
- DeTienne, D. R., McKelvie, A., & Chandler, G. N. 2015. Making sense of entrepreneurial exit strategies: A typology and test. *Journal of Business Venturing*, 30(2): 255-272.
- Dewald, J., & Bowen, F. 2010. Storm clouds and silver linings: Responding to disruptive innovations through cognitive resilience. *Entrepreneurship Theory and Practice*, 34(1): 197-218.
- Dhliwayo, S. 2008. Experiential learning in entrepreneurship education: A prospective model for South African tertiary institutions. *Education + Training*, 50(4): 329-340.
- Dickson, P. H., Solomon, G. T., & Weaver, K. M. 2008. Entrepreneurial selection and success: Does education matter? *Journal of Small Business and Enterprise Development*, 15(2): 239–258.
- Dimov, D. 2007. Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities. *Entrepreneurship Theory and Practice*, 31(5): 713-731.
- Doern, R., & Goss, D. 2014. The Role of Negative Emotions in the Social Processes of Entrepreneurship: Power Rituals and Shame-Related Appeasement Behaviors. *Entrepreneurship Theory and Practice*, 38(4): 863-890.
- Dohse, D., & Walter, S. G. 2012. Knowledge context and entrepreneurial intentions among students. *Small Business Economics*, 39(4): 877-895.
- Donnellon, A., Ollila, S., & Middleton, K. W. 2014. Constructing entrepreneurial identity in entrepreneurship education. *International Journal of Management Education*, 12(3): 490–499.
- Dunkelberg, W., Moore, C., Scott, J., & Stull, W. 2013. Do entrepreneurial goals matter? Resource allocation in new owner-managed firms. *Journal of Business Venturing*, 28(2): 225-240.
- Duval-Couetil, N., Shartrand, A., & Reed-Rhoads, T. (2015). The role of entrepreneurship program models and experiential activities on engineering student outcomes. *Adv. Eng. Educ.*
- Dweck, C. 2006. *Mindset: The new psychology of success*. Random House.
- Dyer, G. (1994), Toward a theory of entrepreneurial careers, *Entrepreneurship: Theory & Practice*, 19(2), 7.

- Eggers, J., & Song, L. 2015. Dealing with failure: Serial entrepreneurs and the costs of changing industries between ventures. *Academy of Management Journal*, 58(6): 1785- 1803.
- Engel, Y., van Burg, E., Kleijn, E., & Khapova, S. N. 2017. Past Career in Future Thinking: How Career Management Practices Shape Entrepreneurial Decision Making. *Strategic Entrepreneurship Journal*, 11(2): 122-144
- Erikson, T. 2002. Entrepreneurial capital: the emerging venture's most important asset and competitive advantage. *Journal of Business Venturing*, 17(3): 275-290.
- Estrin, S., Mickiewicz, T., & Stephan, U. 2016. Human capital in social and commercial entrepreneurship. *Journal of Business Venturing*, 31(4): 449-467.
- Falck, O., Heblich, S., & Luedemann, E. 2012. Identity and entrepreneurship: do school peers shape entrepreneurial intentions? *Small Business Economics*, 39(1): 39-59.
- Fayolle, A. 2013. Personal views on the future of entrepreneurship education. *Entrepreneurship and Regional Development*, 25(7–8): 692–701.
- Fayolle, A., & Gailly, B. 2008. From craft to science: Teaching models and learning processes in entrepreneurship education. *Journal of European Industrial Training*, 32(7): 569–593.
- Fayolle, A., & Gailly, B. 2015. The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of Small Business Management*, 53(1): 75–93.
- Fayolle, A., Gailly, B., & Lassas-Clerc, N. 2006. Assessing the impact of entrepreneurship education programmes: A new methodology. *Journal of European Industrial Training*, 30(9): 701–720.
- Fayolle, A., Verzat, C., & Wapshott, R. (2016). In quest of legitimacy: The theoretical and methodological foundations of entrepreneurship education research. *International Small Business Journal*, 34(7), 895-904.
- Fiet, J. O. 2001a. The pedagogical side of entrepreneurship theory. *Journal of Business Venturing*, 16(2): 101-117.
- Fiet, J. O. 2001b. The theoretical side of teaching entrepreneurship. *Journal of Business Venturing*, 16(1): 1-24.
- Fiet, J. O. 2007. A prescriptive analysis of search and discovery. *Journal of Management Studies*, 44(4): 592-611.
- Fiet, J., & Patel, P. 2008. Entrepreneurial Discovery as Constrained, Systematic Search. *Small Business Economics*, 30(3): 215-229.
- Fiet, J. O., Piskounov, A., & Patel, P. C. 2005. Still Searching (Systematically) for Entrepreneurial Discoveries. *Small Business Economics*, 25(5): 489-504.
- Filion, L.J. 1994. Ten steps to entrepreneurial teaching, *JSBE*, 11(3), 68-78.
- Fini, R., Grimaldi, R., Marzocchi, G. L., & Sobrero, M. 2012. The determinants of corporate entrepreneurial intention within small and newly established firms. *Entrepreneurship Theory and Practice*, 36(2): 387-414.
- Fisher, G., Kotha, S., & Lahiri, A. 2016. Changing with the times: An integrated view of identity, legitimacy, and new venture life cycles. *Academy of Management Review*, 41(3): 383-409.
- Fisher, G., Kuratko, D. F., Bloodgood, J. M., & Hornsby, J. S. 2017. Legitimate to whom? The challenge of audience diversity and new venture legitimacy. *Journal of Business Venturing*, 32(1): 52-71.
- Fitzsimmons, J. R., & Douglas, E. J. 2011. Interaction between feasibility and desirability in the formation of entrepreneurial intentions. *Journal of Business Venturing*, 26(4): 431-440.
- Fleming, P. (1996), "Entrepreneurial education in Ireland: a longitudinal study", *Academy of Entrepreneurship Journal*, European edition, Vol. 2 No. 1, pp. 95-119.
- Forbes, D. P. 2005. Are some entrepreneurs more overconfident than others? *Journal of Business Venturing*, 20(5): 623-640.
- Frank, H., & Landström, H. 2016. What makes entrepreneurship research interesting? Reflections on strategies to overcome the rigour–relevance gap. *Entrepreneurship & Regional Development*, 28(1-2): 51-75.
- Fredrickson, B. L. 1998. What good are positive emotions? *Review of general psychology*, 2(3): 300-319.
- Garavan, T. N., & O’Cinneide, B. 1994. Entrepreneurship education and training programmes: A review and evaluation – Part 1. *Journal of European Industrial Training*, 18(8): 3–12.
- Gartner, W. B., & Vesper, K. H. 1994. Experiments in entrepreneurship education: successes and failures. *Journal of Business Venturing*, 9(3): 179-187.
- Garud, R., Schildt, H. A., & Lant, T. K. 2014. Entrepreneurial storytelling, future expectations, and the paradox of legitimacy. *Organization Science*, 25(5): 1479-1492.
- Gasse, Y. 1985. A strategy for the promotion and identification of potential entrepreneurs at the secondary school level, *FER, Babson College*, 538-559.
- Gibb, A.A. (1987a), "Education for enterprise: training for small business initiation – some contrasts", *Journal of Small Business and Entrepreneurship*, Vol. 4 No. 3, pp. 42-7.
- Gibb, A. A. 1987b. Enterprise culture—its meaning and implications for education and training. *Journal of European Industrial Training*, 11(2): 2-38.

- Gibb, A. A. 1993. Enterprise Culture and Education Understanding Enterprise Education and Its Links with Small Business, *Entrepreneurship and Wider Educational Goals*. *International Small Business Journal*, 11(3): 11-34.
- Gibb, A. A. 1994. Do we really teach (approach) small business the way we should?, *JSBE*, 11(2), 4-27.
- Gibb, A.A. (1997), "Small firms' training and competitiveness. Building upon the small business as a learning organisation", *International Small Business Journal*, Vol. 15 No. 3, pp. 13-29. Gibb, A.A. (2000), "SME policy, academic research and the growth of ignorance, mythical concepts, myths, assumptions, rituals and confusions", *International Small Business Journal*, Vol. 18 No. 3, pp. 13-35.
- Gilbert, D. H. 2012. From chalk and talk to walking the walk: Facilitating dynamic learning contexts for entrepreneurship students in fast-tracking innovations. *Education 1 Training*, 54(2/3): 152–166.
- Gielnik, M. M., Frese, M., Kahara-Kawuki, A., Katono, I. W., Kyejjusa, S., Ngoma, M., . . . Orobia, L. 2015. Action and action-regulation in entrepreneurship: evaluating a student training for promoting entrepreneurship. *Academy of Management Learning & Education*, 14(1): 69-94.
- Goel, S., & Karri, R. 2006. Entrepreneurs, Effectual Logic, and Over-Trust. *Entrepreneurship Theory and Practice*, 30(4): 477-493.
- Gondim, G. M. S., & Mutti, C. 2011. Affections in learning situations: A study of an entrepreneurship skills development course. *Journal of Workplace Learning*, 23(3): 195–208.
- Gordon, I., Hamilton, E., & Jack, S. 2012. A study of a university-led entrepreneurship education programme for small business owner/managers. *Entrepreneurship and Regional Development*, 24(9-10): 767–805.
- Gorman, G., Hanlon, D., & King, W. 1997. Some research perspectives on entrepreneurship education, enterprise education and education for small business management: a ten-year literature review. *International Small Business Journal*, 15(3): 56-77.
- Greene, P. G., Katz, J. A., & Johannisson, B. 2004. Entrepreneurship education. *Academy of Management Learning & Education*, 3: 238–241.
- Greene, F. J., & Saridakis, G. 2008. The role of higher education skills and support in graduate self-employment. *Studies in Higher Education*, 33(6): 653–672.
- Greve, A., & Salaff, J. W. 2003. Social networks and entrepreneurship. *Entrepreneurship Theory and Practice*, 28(1): 1-22.
- Grimes, M. 2010. Strategic sensemaking within funding relationships: The effects of performance measurement on organizational identity in the social sector. *Entrepreneurship Theory and Practice*, 34(4): 763-783.
- Grimes, M. G. 2018. The pivot: How founders respond to feedback through idea and identity work. *Academy of Management Journal*, In press. DOI: 10.5465/amj.2015.0823.
- Grichnik et al., 2004;
- Grossman, E. B., Yli-Renko, H., & Janakiraman, R. 2012. Resource search, interpersonal similarity, and network tie valuation in nascent entrepreneurs' emerging networks. *Journal of Management*, 38(6): 1760-1787.
- Grühn, B., Strese, S., Flatten, T. C., Jaeger, N. A., & Brettel, M. 2017. Temporal Change Patterns of Entrepreneurial Orientation: A Longitudinal Investigation of CEO Successions. *Entrepreneurship Theory and Practice*, 41(4): 591-619.
- Gundry, L. K., & Kickul, J. R. 1996. Flights of imagination: fostering creativity through experiential learning. *Simulation & Gaming*, 27(3): 334-349.
- Gupta, V. K., Goktan, A. B., & Gunay, G. 2014. Gender differences in evaluation of new business opportunity: A stereotype threat perspective. *Journal of Business Venturing*, 29(2): 273-288.
- Gurses, K., & Ozcan, P. 2015. Entrepreneurship in regulated markets: framing contests and collective action to introduce pay TV in the US. *Academy of Management Journal*, 58(6): 1709-1739.
- Haines, G.H.Jr. (1988), *The ombudsman: teaching entrepreneurship*, *Interfaces*, 18(5), 23.
- Hallen, B. L. 2008. The causes and consequences of the initial network positions of new organizations: From whom do entrepreneurs receive investments? *Administrative Science Quarterly*, 53(4): 685-718.
- Hallen, B. L., & Eisenhardt, K. M. 2012. Catalyzing strategies and efficient tie formation: how entrepreneurial firms obtain investment ties. *Academy of Management Journal*, 55(1): 35-70.
- Haynie et al., 2010
- Hansemark, O., (1998), *The effects of an entrepreneurship programme on need for achievement and locus of control of reinforcement*, *International Journal of Entrepreneurial Behaviour & Research*, 4(1), 28.
- Harms, R. 2015. Self-regulated learning, team learning and project performance in entrepreneurship education: Learning in a lean startup environment. *Technological Forecasting & Social Change*, 100: 21-28.
- Hatten, T.S. and Ruhland, S.K. (1995), *Student attitude toward entrepreneurship as affected by participation in an SBI program*, *Journal of Education for Business*, 70(4), 224.
- Hayward, M. L. A., Shepherd, D. A., & Griffin, D. 2006. A Hubris Theory of Entrepreneurship. *Management Science*, 52(2): 160-172.

- Hechavarría, D. M., Terjesen, S. A., Ingram, A. E., Renko, M., Justo, R., & Elam, A. 2017. Taking care of business: the impact of culture and gender on entrepreneurs' blended value creation goals. *Small Business Economics*, 48(1): 225-257.
- Henry, C., Hill, F. M., & Leitch, C. M. 2003. *Entrepreneurship education and training*. Aldershot, Great Britain: Ashgate.
- Henry, C., Hill, F. M., & Leitch, C. M. 2005. *Entrepreneurship education and training: Can entrepreneurship be taught?* Part 1. *Education & Training*, 47: 98–111.
- Henry, C., Hill, F. M., & Leitch, C. M. 2005. *Entrepreneurship education and training: Can entrepreneurship be taught?* Part 2. *Education & Training*, 47 (3) 158-169.
- Henry, C., Hill, F. M., & Leitch, C. M. 2004. The effectiveness of training for new business creation. A longitudinal study. *International Small Business Journal*, 22(3): 249–271.
- Higgins, D., & Elliott, C. 2011. Learning to make sense: what works in entrepreneurial education? *Journal of European Industrial Training*, 35(4): 345-367.
- Hill, S. and O'Connide, B. (1998), "Entrepreneurship education – case studies from the Celtic Tiger", Proceedings of the Enterprise and Learning Conference, University of Aberdeen, September.
- Hills, G. E. 1988. Variations in university entrepreneurship education: an empirical study of an evolving field. *Journal of Business Venturing*, 3(2): 109-122.
- Hindle, K., (2002), A grounded theory for teaching entrepreneurship using simulation games, *Simulation & Gaming*, 33(2), 236.
- Hisrich, R.D. and Peters, M.P. (1998), *Entrepreneurship*, 4th ed., Irwin McGraw-Hill, Boston, MA.
- Hjorth, D. 2011. On provocation, education and entrepreneurship. *Entrepreneurship and Regional Development*, 23(1-2): 49-63
- Hmieleski, K. M., & Corbett, A. C. 2008. The contrasting interaction effects of improvisational behavior with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction. *Journal of Business Venturing*, 23(4): 482-496.
- Hollingsworth, T. A., Klatt, L., and Zimmerer, T., (1974), An untapped resource for small business: Business school graduates, *Journal of Small Business Management (pre-1986)*, 12, 42.
- Holoviak, S.J. and Ackelsberg, R. (1983), Small business management assistance: a university experience in a rural environment, *American Journal of Small Business*, 8 (2), 3.
- Honig, B. 2004. Entrepreneurship education: Toward a model of contingency based business planning. *Academy of Management Learning & Education*, 3(3): 258-273.
- Hood, J.N. & Young, J.E. 1993. Entrepreneurship's requisite areas of development: A survey of top executives in successful entrepreneurial firms, *JBV*, 8(2), 115-135.
- Howorth, C., & Moro, A. 2006. Trust within entrepreneur bank relationships: Insights from Italy. *Entrepreneurship Theory and Practice*, 30(4): 495-517
- Howorth, C., Smith, S. M., & Parkinson, C. 2012. Social learning and social entrepreneurship education. *Academy of Management Learning & Education*, 11(3): 371-389.
- Hsu, Y.-W. 2010. Staging of venture capital investment: a real options analysis. *Small Business Economics*, 35(3): 265-281.
- Hynes, B., Costin, Y., & Birdthistle, N. 2010. Practice-based learning in entrepreneurship education: a means of connecting knowledge producers and users. *Higher Education, Skills and Work-based Learning*, 1(1): 1628.
- Hytti, U., Stenholm, P., Heinonen, J., & Seikkula-Leino, J. 2010. Perceived learning outcomes in entrepreneurship education: The impact of student motivation and team behaviour. *Education 1 Training*, 52(8/9): 587–606.
- Hägg, G. & Gabriëlsson, J. 2017. Evolution of pedagogy in research on entrepreneurship education: Reviewing achievements and addressing challenges, In: Hägg, G. *Experiential entrepreneurship education Reflective thinking as a counterbalance to action for developing entrepreneurial knowledge*, PhD dissertation, Department of Business Administration, Lund University.
- Hägg, G., & Kurczewska, A. 2016. Connecting the dots—A discussion on key concepts in contemporary entrepreneurship education. *Education + Training*, 58(7/8): 700-714.
- Ivancevich, J.M. 1991. A traditional faculty member's perspective on entrepreneurship, *JBV*, 6(1), 1-7.
- Jack, S. L., & Anderson, R. 1998. Entrepreneurship education within the condition of entrepreneurship. Paper presented at the Proceedings of the Conference on Enterprise and Learning, Aberdeen, Scotland.
- Jack, S. L., & Anderson, A. R. 1999. Entrepreneurship education within the enterprise culture: Producing reflective practitioners. *International Journal of Entrepreneurial Behaviour & Research*, 5(3): 110-125.
- Jamieson, I. 1984. Education for Enterprise. In A. G. Watts & P. Moran (Eds.), *CRAC*: 19-27. Cambridge: Ballinger.

- Jenkins, A. S., Wiklund, J., & Brundin, E. 2014. Individual responses to firm failure: Appraisals, grief, and the influence of prior failure experience. *Journal of Business Venturing*, 29(1): 17–33.
- Jennings, J. E., & McDougald, M. S. 2007. Work-family interface experiences and coping strategies: Implications for entrepreneurship research and practice. *Academy of Management Review*, 32(3): 747-760.
- Joensuu, S., Viljamaa, A., Varamaki, E., & Tornikoski, E. 2013. Development of entrepreneurial intention in higher education and the effect of gender: A latent growth curve analysis. *Education 1 Training*, 55(8/9): 781–803.
- Johannisson, B. 1991. University training for entrepreneurship: Swedish approaches. *Entrepreneurship & Regional Development*, 3(1): 67-82.
- Jones, C. 2006. Constructive alignment: A journey for new eyes. *Journal of Enterprising Culture*, 14(4): 291-306.
- Jones, C. 2010. Entrepreneurship education: revisiting our role and its purpose. *Journal of small business and enterprise development*, 17(4): 500-513.
- Jones, B. & Iredale, N. 2010. Enterprise education as pedagogy. *Education + Training*, 52 (1), 7-19.
- Jones, C., Matlay, H., Penaluna, K., & Penaluna, A. 2014. Claiming the future of enterprise education. *Education + Training*, 56(8/9): 764-775.
- Kao, K.W.Y. 1994. From general management to entrepreneurship: The Business (B) school challenge, *JSBE*, 11(2), 4-10.
- Karlsson, T., & Honig, B. 2009. Judging a business by its cover: An institutional perspective on new ventures and the business plan. *Journal of Business Venturing*, 24(1): 27-45.
- Kassean, H., Vanevenhoven, J., Liguori, E., & Winkel, D. E. 2015. Entrepreneurship education: a need for reflection, real-world experience and action. *International Journal of Entrepreneurial Behavior & Research*, 21(5): 690-708.
- Katz, J.A. 1991. Endowed positions: entrepreneurship and related fields, *Entrepreneurship Theory and Practice*, 15(3), 53.
- Katz, J. A. 1994. Modelling entrepreneurial career progressions: Concepts and considerations, *Entrepreneurship: Theory & Practice*, 19(2), 23.
- Katz, J. A. 1999. Institutionalizing elegance: When simulation becomes a requirement. *Simulation & Gaming*, 30(3): 332-336.
- Katz, J. A. 2003. The chronology and intellectual trajectory of American entrepreneurship education 1876-1999, *Journal of Business Venturing*, 18(2), 283.
- Katz, J.A. 2008. Fully mature but not fully legitimate: A different perspective on the state of entrepreneurship education. *Journal of Small Business Management*, 46 (4), 550-566.
- Kautonen, T., Kibler, E., & Minniti, M. 2017. Late-career entrepreneurship, income and quality of life. *Journal of Business Venturing*, 32(3): 318-333.
- Kelmar, J.H. 1992. Business plans for teaching entrepreneurial behaviour, *Education & Training*, 34(1), 30.
- Khavul, S., Bruton, G. D., & Wood, E. 2009. Informal family business in Africa. *Entrepreneurship Theory and Practice*, 33(6): 1219-1238.
- Kim, G. O. 2006. Do equally owned small businesses have equal access to credit? *Small Business Economics*, 27(4): 369-386.
- Kirby, D. 1998. Students in small business: an assessment of the 1994 STEP student placement scheme, *International Small Business Journal*, 16(3), 133.
- Kirkpatrick, D. L. 1959. Techniques for evaluating training programs. *Journal of the American Society of Training Directors*, 13: 3–26.
- Kirkwood, J., Dwyer, K., & Gray, B. 2014. Students' reflections on the value of an entrepreneurship education. *International Journal of Management Education*, 12(3): 307–316
- Kirchhoff, B. A., & Greene, P. G. 1998. Understanding the theoretical and empirical content of critiques of US job creation research. *Small Business Economics*, 10(2): 153-169.
- Klapper, R. 2004. Government goals and entrepreneurship education - an investigation at a Grande Ecole in France, *Education & Training*, 46(2/3), 127.
- Klofsten, M. 2000. Training entrepreneurship at universities: a Swedish case, *Journal of European Industrial Training*, 24(6), 337.
- Koch, A., Nafziger, J. & Skyt Nielsen, H. 2015. Behavioral economics of education. *Journal of Economic Behavior & Organization* 115, 3–17.
- Koh, H.C. 1996. Testing hypotheses of entrepreneurial characteristics A study of Hong Kong MBA students, *Journal of Managerial Psychology*, 11(3), 12.

- Krueger, N. 2015. What do students learn from entrepreneurship education? Entrepreneurship360 thematic paper. Paris, France: OECD.
- Kuechle, G., Boulu-Reshef, B., & Carr, S. D. 2016. Prediction- and Control-Based Strategies in Entrepreneurship: The Role of Information. *Strategic Entrepreneurship Journal*, 10(1): 43-64.
- Kuratko, D. F. 2005. The emergence of entrepreneurship education: Development, trends, and challenges. *Entrepreneurship Theory and Practice*, 29(5): 577-598.
- Kyndt, E., & Baert, H. 2015. Entrepreneurial competencies: Assessment and predictive value for entrepreneurship. *Journal of Vocational Behavior* 90, 13-25.
- Kwon, I., & Sohn, K. 2017. Job dissatisfaction of the self-employed in Indonesia. *Small Business Economics*: 49(1): 1-17.
- Lackeus, M. 2014. An emotion based approach to assessing entrepreneurial education. *International Journal of Management Education*, 12(3): 374-396.
- Lackeus, M. 2015. 'Entrepreneurship in education-What, why, when, how. Trento, Italy: Background paper for OECD-LEED.
- Lackéus, M., & Williams Middleton, K. 2015. Venture Creation Programs: bridging entrepreneurship education and technology transfer. *Education + Training*, 57(1): 48-73.
- Lackéus, M., Lundqvist, M., & Williams Middleton, K. 2016. Bridging the traditional-progressive education rift through entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 22(6): 777-803.
- Lanero, A., Vazquez, J. L., Gutierrez, P., & García, M. P. 2011. The impact of entrepreneurship education in European universities: An intention-based approach analyzed in the Spanish area. *International Review on Public and Nonprofit Marketing*, 8(2): 111-130.
- Lange, J., Marram, E., Jawahar, A. S., Yong, W., & Bygrave, W. 2014. Does an entrepreneurship education have lasting value? A study of careers of 3,775 alumni. *Journal of Business and Entrepreneurship*, 25(2): 1-31.
- Lee, J.-H., & Venkataraman, S. 2006. Aspirations, market offerings, and the pursuit of entrepreneurial opportunities. *Journal of Business Venturing*, 21(1): 107-123.
- Leitch, C., and Harrison, R. 1999. A process model for entrepreneurship education and development, *International Journal of Entrepreneurial Behaviour & Research*, 5(3), 83.
- Lévesque, M., Minniti, M., & Shepherd, D. 2009. Entrepreneurs' decisions on timing of entry: learning from participation and from the experiences of others. *Entrepreneurship Theory and Practice*, 33(2): 547-570.
- Li, X.-H., & Liang, X. 2015. A Confucian social model of political appointments among Chinese private-firm entrepreneurs. *Academy of Management Journal*, 58(2): 592-617.
- Lima, E., Lopes, R. M., Nassif, V., & Silva, D. 2015. Opportunities to improve entrepreneurship education: Contributions considering Brazilian challenges. *Journal of Small Business Management*, 53(4): 1033-1051.
- Liñán, F., & Fayolle, A. 2015. A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda. *International Entrepreneurship and Management Journal*, 11(4): 907-933.
- Lourenço, F., Sappleton, N., & Cheng, R. 2015. Gender and Business Ethics of Enterprise Students and Nascent Entrepreneurs Engaged in Entrepreneurship Education. *Journal of Entrepreneurship*, 24(2): 186-203.
- Low, M., Venkataraman, S. and Srivatsan, V. 1994. Developing an entrepreneurship game for teaching and research, *Simulation & Gaming*, 25(3), 383.
- Luthje, C. and Franke, N. 2003. The 'making' of an entrepreneur: Testing a model of entrepreneurial intent among engineering students at MIT, *R & D Management*, 33 (2), 135.
- Lyons, R., Lynn, T., & Mac an Bhaird, C. 2015. Individual level assessment in entrepreneurship education: An investigation of theories and techniques. *Journal of Entrepreneurship Education*, 18(1): 136-156.
- Löbler, H. 2006. Learning entrepreneurship from a constructivist perspective. *Technology Analysis & Strategic Management*, 18(1): 19-38.
- Macfarlane, B. and Tomlinson, K. 1993. Managing and assessing student enterprise projects, *Education & Training*, 35(3), 33.
- Man, T. W. Y., & Farquharson, M. 2015. Psychological ownership in team-based entrepreneurship education activities. *International Journal of Entrepreneurial Behaviour & Research*, 21(4): 600-621.
- Manolova, T. S., Carter, N. M., Manev, I. M., & Gyoshev, B. S. 2007. The differential effect of men and women entrepreneurs' human capital and networking on growth expectancies in Bulgaria. *Entrepreneurship Theory and Practice*, 31(3): 407-426.
- Mantere, S., Aula, P., Schildt, H., & Vaara, E. 2013. Narrative attributions of entrepreneurial failure. *Journal of Business Venturing*, 28(4): 459-473.

- Martin, B. C., McNally, J. J., & Kay, M. J. 2013. Examining the formation of human capital in entrepreneurship: A metaanalysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2): 211–224
- Marvel, M. R., & Lumpkin, G. T. 2007. Technology entrepreneurs' human capital and its effects on innovation radicalness. *Entrepreneurship Theory and Practice*, 31(6): 807-828.
- Matlay, H. 2001. Entrepreneurial and vocational education and training in central and Eastern Europe, *Education & Training*, 43 (8/9), 395.
- Matusik, S. F., George, J. M., & Heeley, M. B. 2008. Values and judgment under uncertainty: evidence from venture capitalist assessments of founders. *Strategic Entrepreneurship Journal*, 2(2): 95-115.
- Maxwell, A. L., Jeffrey, S. A., & Lévesque, M. 2011. Business angel early stage decision making. *Journal of Business Venturing*, 26(2): 212-225.
- McCaffrey, M. 2014. On the Theory of Entrepreneurial Incentives and Alertness. *Entrepreneurship Theory and Practice*, 38(4): 891-911.
- McGrath, R. G. 1999. Falling forward: Real options reasoning and entrepreneurial failure. *Academy of Management Academy of Management Review*, 24(1): 13-30.
- McKelvie, A., Haynie, J. M., & Gustavsson, V. 2011. Unpacking the uncertainty construct: Implications for entrepreneurial action. *Journal of Business Venturing*, 26(3): 273-292.
- McLarty, R., (2003), Graduate entrepreneurship: a critical review of problems, issues and personal competencies, *International Journal of Entrepreneurship and Innovation Management*, 3(5,6), 621.
- McMullan, W.E. 1988. The economics of entrepreneurship education, *JSBE*, 6(1), 8-18.
- McMullan, C.A. & Boberg, A.L. 1991. The relative effectiveness of projects in teaching entrepreneurship, *JSBE*, 9(1), 14-24.
- McMullan, W.E., Chrisman, J.J. and Vesper, K. 2001. Some problems in using subjective measures of effectiveness to evaluate entrepreneurial assistance programs, *Entrepreneurship Theory and Practice*, Vol. 26 No. 1, pp. 37-54.
- McMullan, W.E. and Gillin, L.M. (1998), Industrial viewpoint - entrepreneurship education: developing technological start-up entrepreneurs: A case study of a graduate entrepreneurship programme at Swinburne University, *Technovation*, 18(4), 275.
- McMullen, J. S., & Kier, A. S. 2016. Trapped by the entrepreneurial mindset: Opportunity seeking and escalation of commitment in the Mount Everest disaster. *Journal of Business Venturing*, 31(6): 663-686.
- McMullan, W.E., & Long, W. A. 1987. Entrepreneurship education in the nineties. *Journal of Business Venturing*, 2(3): 261-275.
- McMullen, J. S., & Shepherd, D. A. 2006. Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31(1): 132-152.
- McMullen, J. S., & Warnick, B. J. 2016. Should we require every new venture to be a hybrid organization? *Journal of Management Studies*, 53(4): 630-662.
- McVea, J. F. 2009. A field study of entrepreneurial decision-making and moral imagination. *Journal of Business Venturing*, 24(5): 491-504.
- Mentoor, E. R., & Friedrich, C. 2007. Is entrepreneurial education at South African universities successful? An empirical example. *Industry and Higher Education*, 21(3): 221–232.
- Meyskens, M., Robb-Post, C., Stamp, J. A., Carsrud, A. L., & Reynolds, P. D. 2010. Social ventures from a Resource-Based perspective: An exploratory study assessing global Ashoka fellows. *Entrepreneurship Theory and Practice*, 34(4): 661-680.
- Miller, D., & Sardais, C. 2015. Bifurcating time: How entrepreneurs reconcile the paradoxical demands of the job. *Entrepreneurship Theory and Practice*, 39(3): 489-512.
- Mitchell, J. R., & Shepherd, D. A. 2010. To thine own self be true: Images of self, images of opportunity, and entrepreneurial action. *Journal of Business Venturing*, 25(1): 138-154.
- Mitchell, R. K., Mitchell, J. R., & Smith, J. B. 2008. Inside opportunity formation: Enterprise failure, cognition, and the creation of opportunities. *Strategic Entrepreneurship Journal*, 2(3): 225-242.
- Moberg, S.K. 2014. Assessing the impact of entrepreneurship education: From ABC to Ph.D. Doctoral thesis, Department of Strategic Management and Globalization, Copenhagen Business School.
- Monroy, T.G. 1995. Education getting closer to a descriptive model of entrepreneurship education”, in Monroy, T.G., Reichert, J. and Hoy, F. (Eds), *The Art and Science of Entrepreneurship Education*, Vol. 3, Ballinger, Cambridge, MA, pp. 205-17.
- Morris, M., Kuratko, D., & Covin, J. G. 2011. *Corporate Entrepreneurship & Innovation: Entrepreneurial Development within Organizations* (3ed.). US: South-Western Cengage Learning.

- Morris, M. H., Webb, J. W., Fu, J., & Singhal, S. 2013. A competency-based perspective on entrepreneurship education: Conceptual and empirical insights. *Journal of Small Business Management* 51(3) 352–369.
- Muehlfeld, K., Urbig, D., & Weitzel, U. 2015. Entrepreneurs' Exploratory Perseverance in Learning Settings. *Entrepreneurship Theory and Practice*, 41(4): 533-565.
- Mueller, S., & Anderson, A. R. 2014. Understanding the entrepreneurial learning process and its impact on students' personal development: A European perspective. *International Journal of Management Education*, 12(3): 500–511.
- Mueller, B. A., & Shepherd, D. A. 2016. Making the most of failure experiences: Exploring the relationship between business failure and the identification of business opportunities. *Entrepreneurship Theory and Practice*, 40(3): 457-487
- Mullins, J. W., & Forlani, D. 2005. Missing the boat or sinking the boat: A study of new venture decision making. *Journal of Business Venturing*, 20(1): 47-69.
- Muñoz, P., & Dimov, D. 2015. The call of the whole in understanding the development of sustainable ventures. *Journal of Business Venturing*, 30(4): 632-654.
- Murnieks, C. Y., Mosakowski, E., & Cardon, M. S. 2014. Pathways of passion: Identity centrality, passion, and behavior among entrepreneurs. *Journal of Management*, 40(6): 1583-1606.
- Mwasalwiba, E. S. 2010. Entrepreneurship education: a review of its objectives, teaching methods, and impact indicators. *Education + Training*, 52(1): 20- 47.
- Nabi, G., Liñán, F., Krueger, N., Fayolle, A., & Walmsley, A. 2016. The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), 277-299.
- Naia, A., Baptista, R., Januário, C., & Trigo, V. 2014. A systematization of the literature on entrepreneurship education: Challenges and emerging solutions in the entrepreneurial classroom. *Industry and Higher Education*, 28(2): 79-96.
- Naia, A., Baptista, R., Januário, C., & Trigo, V. 2015. Entrepreneurship education literature in the 2000s. *Journal of Entrepreneurship Education*, 18(1): 111-135.
- Nanda, R., & Sørensen, J. 2010. Workplace Peers and Entrepreneurship. *Management Science*, 56(7): 1116-1126
- Neck, H. M., & Greene, P. G. 2011. Entrepreneurship education: known worlds and new frontiers. *Journal of Small Business Management*, 49(1), 55-70.
- Neck, H. M., Greene, P. G., & Brush, C. G. (2014). *Teaching entrepreneurship: A practice-based approach*: Edward Elgar Publishing.
- Neergaard, H., Tanggaard, L., Krueger, N., & Robinson, S. 2012. Pedagogical interventions in entrepreneurship from behaviorism to existential learning. *Proceedings*. Dublin, Ireland: Institute for Small Business and Entrepreneurship.
- Nguyen, T. V., & Rose, J. 2009. Building trust—Evidence from Vietnamese entrepreneurs. *Journal of Business Venturing*, 24(2): 165-182.
- Osterwalder, A., & Pigneur, Y. 2010. *Business model generation: a handbook for visionaries, game changers, and challengers*. New Jersey: John Wiley & Sons.
- O’Gorman, C. and Cunningham, J. (1997), *Enterprise in Action – An Introduction to Entrepreneurship in an Irish Context*, Oak Tree Press, Dublin.
- Orser, B. J., Riding, A. L., & Manley, K. 2006. Women entrepreneurs and financial capital. *Entrepreneurship Theory and Practice*, 30(5): 643-665.
- Ozgen, E., & Baron, R. A. 2007. Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums. *Journal of Business Venturing*, 22(2): 174-192.
- Patzelt, H., & Shepherd, D. A. 2011. Recognizing opportunities for sustainable development. *Entrepreneurship Theory and Practice*, 35(4): 631-652.
- Penaluna, K., Penaluna, A., & Jones, C. 2012. The context of enterprise education: insights into current practices. *Industry and Higher Education*, 26(3): 163175.
- Peterman, N., and Kennedy, J., (2003), Enterprise education: influencing students' perceptions of entrepreneurship, *Entrepreneurship Theory and Practice*, 28(2), 129.
- Petridou, E., & Sarri, K. 2011. Developing “potential entrepreneurs” in higher education institutes. *Journal of Enterprising Culture*, 19(1): 79–99.
- Piperopoulos, P., & Dimov, D. 2015. Burst bubbles or build steam? Entrepreneurship education, entrepreneurial self-efficacy, and entrepreneurial intentions. *Journal of Small Business Management*, 53(4): 970–985.

- Pittaway, L., & Cope, J. 2007. Entrepreneurship Education: A Systematic Review of the Evidence. *International Small Business Journal*, 25(5), 479-510.
- Pittaway, L., & Cope, J. 2007b. Simulating entrepreneurial learning integrating experiential and collaborative approaches to learning. *Management Learning*, 38(2): 211-233.
- Pittaway, L., Hannon, P., Gibb, A. & Thompson, J. (2009) Assessment practice in enterprise education, *International Journal of Entrepreneurial Behaviour & Research*, 15(1), 71-93.
- Pittaway, L., & Edwards, C. 2012. Assessment: examining practice in entrepreneurship education. *Education + Training*, 54(8/9), 778-800.
- Pittaway, L., Rodriguez-Falcon, E., Aiyegbayo, O., & King, A. 2011. The role of entrepreneurship clubs and societies in entrepreneurial learning. *International Small Business Journal*, 29(1): 37–57.
- Pittaway, L. and Thedam, J. 2005. Mind the gap: graduate recruitment in small businesses, *International Small Business Journal*, 23(4).
- Plaschka, G., & Welsch, H. 1990. Emerging structures in entrepreneurship education: Curricular designs and strategies. *Entrepreneurship Theory and Practice*, 14(3), 55-71.
- Plummer, L. A., Allison, T. H., & Connelly, B. L. 2016. Better together? Signaling interactions in new venture pursuit of initial external capital. *Academy of Management Journal*, 59(5): 1585-1604.
- Politis, D. 2005. The Process of Entrepreneurial Learning: A Conceptual Framework. *Entrepreneurship Theory and Practice*, 29(4): 399-424.
- Politis, D., & Gabrielsson, J. 2009. Entrepreneurs' attitudes towards failure: An experiential learning approach. *International Journal of Entrepreneurial Behaviour & Research*, 15(4): 364-383.
- Pollack, J. M., Coy, A. E., Green, J. D., & Davis, J. L. 2015. Satisfaction, investment, and alternatives predict entrepreneurs' networking group commitment and subsequent revenue generation. *Entrepreneurship Theory and Practice*, 39(4): 817-837.
- Porter, L.W. (1994), The relation of entrepreneurship education to business education, *Simulation & Gaming*, 25(3), 416.
- Premand, P., Brodmann, S., Almeida, R., Grun, R., & Barouni, M. 2016. Entrepreneurship education and entry into self-employment among university graduates. *World Development*, 77: 311–327.
- Preshing, W.A. 1991. Education by projects, *JSBE*, 9(1), 55-59.
- QAA, 2018. Enterprise and entrepreneurship education: Guidance for UK Higher Education Providers. Gloucester, UK.
- Rae, D., & Carswell, M. 2001. Towards a conceptual understanding of entrepreneurial learning. *Journal of small business and enterprise development*, 8(2): 150-158.
- Rasmussen, A. & Moberg, S.K. 2016. A taxonomy of entrepreneurship education: 2nd edition. The Danish Foundation for Entrepreneurship.
- Rasmussen, E. A., & Sørheim, R. 2006. Action-based entrepreneurship education. *Technovation*, 26(2): 185-194.
- Rassenfosse, G., & Fischer, T. 2016. Venture debt financing: Determinants of the lending decision. *Strategic Entrepreneurship Journal*, 10(3): 235-256.
- Rauch, A., & Hulsink, W. 2015. Putting entrepreneurship education where the intention to act lies: An investigation into the impact of entrepreneurship education on entrepreneurial behavior. *Academy of Management Learning & Education*, 14(2): 187–204.
- Renko, M., Kroeck, K. G., & Bullough, A. 2012. Expectancy theory and nascent entrepreneurship. *Small Business Economics*, 39(3): 667-684.
- Rennemo, Ø. 2015. Entrepreneurial trainers – The competence mix in actionoriented entrepreneurship development programs. *Journal of Entrepreneurship Education*, 18(2): 135-150.
- Rideout, E. C., & Gray, D. O. 2013. Does Entrepreneurship Education Really Work? A Review and Methodological Critique of the Empirical Literature on the Effects of University-Based Entrepreneurship Education. *Journal of Small Business Management*, 51(3): 329-351.
- Ridder, A., and Van der Sijde, P., (2003), Raising awareness of entrepreneurship and e-commerce; a case study on student-entrepreneurship, *International Journal of Entrepreneurship and Innovation Management*, 3(5,6), 609.
- Ries, E. 2011. *The Lean start-up*. Crown Publishing Group.
- Robertson, M., and Collins, A., (2003), The video role model as an enterprise teaching aid, *Education & Training*, 45(6), 331.
- Ronstadt, R. 1985. The educated entrepreneurs: A new era of entrepreneurial education is beginning. *American Journal of Small Business*, 6: 7-23.
- Robinson, S., Neergaard, H., Tanggaard, L., & Krueger, N. 2016. New horizons in entrepreneurship: from teacher-led to student-centered learning. *Education + Training*, 58(7/8): 661-683.

- Ronstadt, R. 1985. The educated entrepreneurs: A new era of entrepreneurial education is beginning. *American Journal of Small Business*, 6: 7-23.
- Ronstadt, R. 1987. The educated entrepreneurs: A new era of entrepreneurial education is beginning. *American Journal of Small Business*, 11(4), 37-53.
- Rosa, P., (2003), 'Hardly likely to make the Japanese tremble': The businesses of recently graduated university and college 'entrepreneurs', *International Small Business Journal*, 21(4), 435.
- Rosti, L., & Chelli, F. 2005. Gender discrimination, entrepreneurial talent and selfemployment. *Small Business Economics*, 24(2): 131-142.
- Ruebottom, T. 2013. The microstructures of rhetorical strategy in social entrepreneurship: Building legitimacy through heroes and villains. *Journal of Business Venturing*, 28(1): 98- 116
- Rubin, R. B., & Martin, M. M. 1994. Development of a measure of interpersonal communication competence. *Communication Research Reports* 11(1) 33-44.
- Saeed, J. (1996), "A critical evaluation of Australian entrepreneurship education and training", Proceedings of the Internationalising Entrepreneurship Education and Training Conference, Arnhem.
- Sanchez, J. C. 2011. University training for entrepreneurial competencies: Its impact on intention of venture creation. *The International Entrepreneurship and Management Journal*, 7(2): 239-254.
- Sarasvathy, S. D. 2001. Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2): 243-263
- Sarasvathy, S. D., & Venkataraman, S. 2011. Entrepreneurship as method: open questions for an entrepreneurial future. *Entrepreneurship Theory and Practice*, 35(1): 113-135.
- Saridakis, G., Marlow, S., & Storey, D. J. 2014. Do different factors explain male and female self-employment rates? *Journal of Business Venturing*, 29(3): 345-362.
- Schindehutte, M., Morris, M., & Allen, J. 2006. Beyond achievement: Entrepreneurship as extreme experience. *Small Business Economics*, 27(4): 349-368.
- Schjoedt, L. 2009. Entrepreneurial job characteristics: An examination of their effect on entrepreneurial satisfaction. *Entrepreneurship Theory and Practice*, 33(3): 619-644.
- Scott, J., Penaluna, A., & Thompson, J. L. 2016. A critical perspective on learning outcomes and the effectiveness of experiential approaches in entrepreneurship education. *Education + Training*, 58(1): 82-93.
- Scott, M.G. and Twomey, D.F. (1988), The long-term supply of entrepreneurs: students' career aspirations in relation to entrepreneurship, *Journal of Small Business Management*, 26(4), 5.
- Seikkula-Leino, J., Ruskovaara, E., Ikavalko, M., Mattila, J., & Rytkola, T. 2010. Promoting entrepreneurship education: the role of the teacher? *Education+ training*, 52(2): 117-127.
- Segers, M., Dochy, F., & Cascallar, E. 2003. *Optimising new modes of assessment: In search of qualities and standards*. Dordrecht: Kluwer Academic Publishers.
- Sexton, D. L., & Bowman, N. B. 1984. Entrepreneurship education: suggestions for increasing effectiveness. *Journal of Small Business Management*, 22(2): 18-25.
- Sexton, D.L. & Bowman-Upton, N.B. 1987. Evaluation of an innovative approach to teaching entrepreneurship, *Journal of Small Business Management*, 25(1), 35.
- Sexton, D. L., & Bowman-Upton, N. 1988. Validation of an innovative teaching approach for entrepreneurship courses. *American Journal of Small Business*, 12(3): 11-18.
- Sirelkhatim, F., & Gangi, Y. 2015. Entrepreneurship education: A systematic literature review of curricula contents and teaching methods. *Cogent Business & Management*, 2(1): 1-11.
- Shepherd, D. A. 2003. Learning from Business Failure: Propositions of Grief Recovery for the Self-Employed. *Academy of Management Review*, 28(2): 318-328.
- Shepherd, D.A. and Douglas, E.J. 1996. Is management education developing or killing the entrepreneurial spirit?, Proceedings of the Internationalising Entrepreneurship Education and Training Conference, Arnhem, June.
- Shepherd, D. A., & Patzelt, H. 2015. Harsh evaluations of entrepreneurs who fail: The role of sexual orientation, use of environmentally friendly technologies, and observers' perspective taking. *Journal of Management Studies*, 52(2): 253-284.
- Shepherd, D. A., McMullen, J. S., & Jennings, P. D. 2007. The formation of opportunity beliefs: overcoming ignorance and reducing doubt. *Strategic Entrepreneurship Journal*, 1(1-2): 75-95.
- Shepherd, D. A., Covin, J. G., & Kuratko, D. F. 2009. Project failure from corporate entrepreneurship: Managing the grief process. *Journal of Business Venturing*, 24(6): 588- 600.
- Shepherd, D. A., & Haynie, J. M. 2011. Venture failure, stigma, and impression management: A self-verification, self-determination view. *Strategic Entrepreneurship Journal*, 5(2): 178-197.

- Shepherd, D. A., Patzelt, H., & Baron, R. A. 2013. "I care about nature, but...": Disengaging values in assessing opportunities that cause harm. *Academy of Management Journal*, 56(5): 1251-1273.
- Shepherd, D. A., Patzelt, H., Williams, T. A., & Warnecke, D. 2014. How does project termination impact project team members? Rapid termination, 'creeping death', and learning from failure. *Journal of Management Studies*, 51(4): 513-546.
- Shepherd, D. A., Patzelt, H., & Wolfe, M. 2011. Moving forward from project failure: Negative emotions, affective commitment, and learning from the experience. *Academy of Management Journal*, 54(6): 1229-1259.
- Shepherd, D.A., Wennberg, K., Suddaby, R. & Wiklund, J. (forthcoming). What are we explaining? A review and agenda on initiating, engaging, performing, and contextualizing entrepreneurship. Forthcoming in *Journal of Management*.
- Sherman, P. S., Sebora, T., & Digman, L. A. 2008. Experiential entrepreneurship in the classroom: effects of teaching methods on entrepreneurial career choice intentions. *Journal of Entrepreneurship Education*, 11: 29-42.
- Shinnar, R. S., Hsu, D. K., & Powell, B. C. 2014. Self-efficacy, entrepreneurial intentions, and gender: Assessing the impact of entrepreneurship education longitudinally. *International Journal of Management Education*, 12(3): 561-570.
- Solomon, G. 2007. An examination of entrepreneurship education in the United States. *Journal of Small Business and Enterprise Development*, 14: 168-182.
- Solomon, G.T. and Fernald, L.W.Jr., (1991), Trends in small business management and entrepreneurship education in the United States, *Entrepreneurship Theory and Practice*, 15(3):25.
- Solomon, G. T. and Weaver, M. K. (1994). A historical examination of small business management and entrepreneurship pedagogy, *Simulation & Gaming*, 25(3), 338-94.
- Solomon, G. T., Weaver, K. M., & Fernald, L. W. 1994. A historical examination of small business management and entrepreneurship pedagogy. *Simulation & Gaming*, 25(3): 338-352.
- Sonfield, M., (1981), Can student consultants really help a small business? *Journal of Small Business Management (pre-1986)*, 19, 3.
- Souitaris, V., Zerbinati, S., & Al-Laham, A. 2007. Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, 22(4): 566-591.
- Spivack, A. J., McKelvie, A., & Haynie, J. M. 2014. Habitual entrepreneurs: Possible cases of entrepreneurship addiction? *Journal of Business Venturing*, 29(5): 651-667.
- Stewart, J. and Knowles, V. 2000. Graduate recruitment and selection practices in small businesses, *Career Development International*, 5(1), 21.
- Stewart, J. and Knowles, V. 2003. Mentoring in undergraduate business management programmes, *Journal of European Industrial Training*, 27(2-4), 147.
- Storey, D. J. 1994. *Understanding the Small Business Sector*. London: Routledge.
- Storey, D.J. 2000. Six steps to heaven: evaluating the impact of public policies to support small business in developed economies, in Sexton, D. and Landstrom, H. (Eds), *The Blackwell Handbook of Entrepreneurship*, Blackwell, Oxford, pp. 176-93.
- Strike, V. M., & Rerup, C. 2016. Mediated sensemaking. *Academy of Management Journal*, 59(3): 880-905.
- Terzieva, L., Luppi, E., & Traina, I. 2015. Teaching and assessing transferable/transversal competences. The case of Socces. *Journal of Science & Research* 8 25-56.
- Thomas, M. K. 2009. The impact of education histories on the decision to become selfemployed: a study of young, aspiring, minority business owners. *Small Business Economics*, 33(4): 455-466.
- Thompson, P., Jones-Evans, D., & Kwong, C. C. Y. 2010. Education and entrepreneurial activity: A comparison of White and South Asian Men. *International Small Business Journal*, 28(2): 147-162.
- Thorndike, E. L. 1921. *The teacher's word book (Vol. 134)*. New York: Teachers College, Columbia University.
- Timmons, J.A. and Stevenson, H.H. 1985. Entrepreneurship education in the 1980s – what entrepreneurs say, in Kao, J. and Stevenson, H.H. (Eds), *Entrepreneurship – What it is and How to Teach it*, Harvard Business School, Cambridge, MA, pp. 115-34.
- Timmons, J.A., Muzyka, D.F., Stevenson, H.M. and Bygrave, W.D. 1987. Opportunity recognition: the core of entrepreneurship, in Churchill, N. (Ed.), *Frontiers of Entrepreneurial Research*, Babson College, Babson Park, MA, pp. 42-9.
- Tocher, N., Oswald, S. L., & Hall, D. J. 2015. Proposing social resources as the fundamental catalyst toward opportunity creation. *Strategic Entrepreneurship Journal*, 9(2): 119-135.

- Townsend, D. M., & Hart, T. A. 2008. Perceived institutional ambiguity and the choice of organizational form in social entrepreneurial ventures. *Entrepreneurship Theory and Practice*, 32(4): 685-700.
- Tracey, P., & Phillips, N. 2007. The distinctive challenge of educating social entrepreneurs: A postscript and rejoinder to the special issue on entrepreneurship education. *Academy of Management Learning & Education*, 6(2): 264-271.
- Turker, D., & Selçuk, S. 2009. Which factors affect entrepreneurial intention of university students? *Journal of European Industrial Training*, 33(2): 142-159.
- Ucbasaran, D., Westhead, P., Wright, M., & Flores, M. 2010. The nature of entrepreneurial experience, business failure and comparative optimism. *Journal of Business Venturing*, 25(6): 541-555.
- Uygur, U., & Kim, S. M. 2016. Evolution of Entrepreneurial Judgment With Venture-Specific Experience. *Strategic Entrepreneurship Journal*, 10(2): 169-193.
- Valliere, D. 2013. Towards a schematic theory of entrepreneurial alertness. *Journal of Business Venturing*, 28(3): 430-442.
- van der Zwan, P., Verheul, I., & Thurik, A. R. 2012. The entrepreneurial ladder, gender, and regional development. *Small Business Economics*, 39(3): 627-643.
- Van Gelderen, M., Van de Sluis, L., & Jansen, P. 2005. Learning opportunities and learning behaviours of small business starters: relations with goal achievement, skill development and satisfaction. *Small Business Economics*, 25(1): 97-108.
- Van Praag, M., & Versloot, P. H. 2008. The economic benefits and costs of entrepreneurship: A review of the research. *Foundations and Trends in Entrepreneurship*, 4(2): 65-154.
- Van der Sijde, P., Van Tilburg, J., Henry, C., Sygne, J. and Asplund, R. 1997. UNISPIN Workbook, UNISPIN Project Team, University of Twente, Twente.
- Verheul, I., Uhlaner, L., & Thurik, R. 2005. Business accomplishments, gender and entrepreneurial self-image. *Journal of Business Venturing*, 20(4): 483-518.
- Vesper, K. H. 1982. Research on education for entrepreneurship. In C. A. Kent, D. L. Sexton, & K. H. Vesper (Eds.), *Encyclopedia of Entrepreneurship*: 321-343. Eaglewood Cliffs, NJ: Prentice-Hall Inc.
- Vesper, K.H. and Gartner, W.B. 1997. Measuring progress in entrepreneurship education. *Journal of Business Venturing*, 12(5), 403.
- Vesper, K.H., McMullan, W.E. & Ray, D.M. 1989. Entrepreneurship education: More than just an adjustment to management education, *ISBJ*, 8(1), 61-65.
- Vincett, P. S., & Farlow, S. 2008. "Start-a-Business": An experiment in education through entrepreneurship. *Journal of Small Business and Enterprise Development*, 15(2): 274-288.
- Vissa, B. 2011. A matching theory of entrepreneurs' tie formation intentions and initiation of economic exchange. *Academy of Management Journal*, 54(1): 137-158.
- Vissa, B. 2012. Agency in action: Entrepreneurs' networking style and initiation of economic exchange. *Organization Science*, 23(2): 492-510.
- Von Graevenitz, G., Harhoff, D., & Weber, R. 2010. The effects of entrepreneurship education. *Journal of Economic Behavior & Organization*, 76(1): 90-112.
- Vorley, T., & Williams, N. 2016. Not just dialing it in: Examining cognitive-based approaches in enterprise education using a smartphone application. *Education 1 Training*, 58(1): 45-60.
- Waldron, T. L., Fisher, G., & Navis, C. 2015. Institutional entrepreneurs' social mobility in organizational fields. *Journal of Business Venturing*, 30(1): 131-149.
- Waldron, T. L., Fisher, G., & Pfarrer, M. 2016. How social entrepreneurs facilitate the adoption of new industry practices. *Journal of Management Studies*, 53(5): 821-845
- Walter, S. G., & Block, J. H. 2016. Outcomes of entrepreneurship education: an institutional perspective. *Journal of Business Venturing*, 31(2): 216-233.
- Wan, V. (1989), "The enterprise workshop programme in Australia", *International Small Business Journal*, Vol. 7 No. 2, pp. 23-34.
- Wang, C. and Wong, P., (2004), Entrepreneurial interest in university students in Singapore, *Technovation*, 24(2), 163.
- Wani, V. P., Garg, T. K., and Sharma, S. K., (2004), Effective industry/institute interaction for developing entrepreneurial vision amongst engineers for the sustainable development of SMEs in India, *International Journal of Technology Transfer & Commercialisation*, 3 (1), 38.
- Wasserman, N. 2003. Founder-CEO succession and the paradox of entrepreneurial success. *Organization Science*, 14(2): 149-172.

- Webb, J. W., Bruton, G. D., Tihanyi, L., & Ireland, R. D. 2013. Research on entrepreneurship in the informal economy: Framing a research agenda. *Journal of Business Venturing*, 28(5): 598-614.
- Weinrauch, J. D. 1984. Educating the entrepreneur: understanding adult learning behavior. *Journal of Small Business Management*, 22(2): 32-37.
- Welter, F., & Lasch, F. 2008. Entrepreneurship research in Europe: Taking stock and looking forward. *Entrepreneurship Theory & Practice*, 32 (2): 241– 248
- Westhead, P., Storey, D., and Martin, F. 2000. The Shell technology enterprise programme: student outcomes, *Education & Training*, 42(4/5), 272.
- Westhead, P., Storey, D.J. and Martin, F. 2001. Outcomes reported by students who participated in the 1994 Shell technology enterprise programme, *Entrepreneurship and Regional Development*, Vol. 13, pp. 163-85.
- Wiklund, J., Davidsson, P., & Delmar, F. 2003. What do they think and feel about growth? An expectancy-value approach to small business managers' attitudes toward growth. *Entrepreneurship Theory and Practice*, 27(3): 247-270.
- Wiklund, J., & Shepherd, D. 2003. Aspiring for, and achieving growth: The moderating role of resources and opportunities. *Journal of Management Studies*, 40(8): 1919-1941.
- Wolfe, M. T., & Patel, P. C. 2016. Grit and self-employment: a multi-country study. *Small Business Economics*, 47(4): 853-874.
- Wood, M., McKelvie, A., & Haynie, J. 2014. Making it personal: Opportunity individuation and the shaping of opportunity beliefs. *Journal of Business Venturing*, 29(2): 252-272.
- Wood, M. S., & Williams, D. W. 2014. Opportunity Evaluation as Rule-Based Decision Making. *Journal of Management Studies*, 51(4): 573-602.
- Wood, M. S., Williams, D. W., & Drover, W. 2017. Past as prologue: Entrepreneurial inaction decisions and subsequent action judgments. *Journal of Business Venturing*, 32: 107-127.
- Wright, P.L. 1994. A policy alternative to externally-sponsored management development and skills training programs aimed at small business, *JSBE*, 11(3), 48-59.
- Wyness, L., Jones, P., & Klapper, R. 2015. Sustainability: what the entrepreneurship educators think. *Education+ training*, 57(8/9): 834-852.
- Wyckham, R.G. 1989. Ventures launched by participants of an entrepreneurial education program, *Journal of Small Business Management*, Vol. 27 No. 2, pp. 54-61.
- Wyrwich, M. 2015. Entrepreneurship and the intergenerational transmission of values. *Small Business Economics*, 45(1): 191-213.
- York, J. G., O'Neil, I., & Sarasvathy, S. D. 2016. Exploring Environmental Entrepreneurship: Identity Coupling, Venture Goals, and Stakeholder Incentives. *Journal of Management Studies*, 53(5): 695-737.
- Young, J.E. (1997), "Entrepreneurship education and learning for university students and practicing entrepreneurs", in Sexton, D.L. and Simlor, R.W. (Eds), *Entrepreneurship 2000*, Upstart Publishing, Chicago, IL.
- Zahra, S. A., Ireland, R. D., & Hitt, M. A. 2000. International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. *Academy of Management Journal*, 43(5): 925-950.
- Zeithaml, C. P., & Rice, G. H. 1987. Entrepreneurship/small business education in American universities. *Journal of Small Business Management*, 25(1): 4450.
- Zhang, J., Souitaris, V., Soh, P. h., & Wong, P. k. 2008. A contingent model of network utilization in early financing of technology ventures. *Entrepreneurship Theory and Practice*, 32(4): 593-613.
- Zheng, Y., & Mai, Y. 2013. A contextualized transactive memory system view on how founding teams respond to surprises: evidence from China. *Strategic Entrepreneurship Journal*, 7(3): 197-213.
- Zheng, Y., Miner, A. S., & George, G. 2013. Does the learning value of individual failure experience depend on group-level success? Insights from a University Technology Transfer Office. *Industrial and Corporate Change*, 22(6): 1557-1586.
- Zhu, Y., Rooney, D., & Phillips, N. 2016. Practice-based Wisdom Theory for Integrating Institutional Logics: A New Model for Social Entrepreneurship Learning and Education. *Academy of Management Learning & Education*, 15(3): 607-625.
- Zott, C., & Huy, Q. N. 2007. How entrepreneurs use symbolic management to acquire resources. *Administrative Science Quarterly*, 52(1): 70-105.
- Åsvoll, H., & Jacobsen, P. J. 2012. A case study: Action based entrepreneurship education how experience problems can be overcome and collaboration problems mitigated *Journal of Entrepreneurship Education*, 15: 75-97.

## APPENDIX

### Summarised versions of the literature reviews

<i>Dainow (1986)</i>	
<i>What/When/How</i>	Broad focus, not only limited to academic journals (18), but also included government documents and conference proceedings. The review covers a 10-year period ending in 1984.
<i>Why</i>	To guide future research efforts, as well as practical efforts. Necessary to assess publications within the field and identify state of the art as well as strengths and weaknesses.
<i>Focus/ Outcome variables/ Teaching methods/ Results</i>	Reflects the field's low level of maturity during the time period in which it was performed. A significant development in the field, both the quantity and the quality of articles. Could benefit from cross-fertilising with related fields (education and instructional design). An increased focus on evaluating outcomes of educational initiatives within the field is necessary. Educational initiatives and evaluations should have a specific focus on target audiences. Overall, it is necessary to increase knowledge about the field by systematic data collection and by applying more varied methodologies.

<i>Gorman, Hanlon &amp; King (1997)</i>	
<i>What and When</i>	92 journal articles from seven high ranked entrepreneurship journals, covering the time period 1985-1994.
<i>How</i>	Categorisation based on the following categories: 1) Theoretical or empirical 2) Target market: enrolled students, out-of-school potential entrepreneurs, business owners, others 3) Content: stages of development in a venture process - entrepreneurial propensity, pre start-up, post start-up, educational processes and structure.
<i>Why</i>	Assess the state and development of research in the field of entrepreneurship education.
<i>Focus</i>	Focuses on education in new venture creation. Discussion about whether educational initiatives should come at an early stage or only at tertiary level. Important to align educational initiative with stage in venture development. Educational initiatives could be tailored to also fulfil the needs of organisations, not only individuals. Strong focus on the growth of the field and how it has emerged as an academic discipline. Necessary to either reform the business schools to give more prevalence to entrepreneurship or for entrepreneurship to leave the management field and developing as an independent academic discipline.
<i>Outcome variables</i>	Strong focus on new venture creation skills such as negotiation, leadership, resource acquisition, but also enterprising skills such as ability to impact one's personal environment, self-confidence, create support network, and personality.
<i>Teaching methods</i>	Cases and projects, project-based learning, small teams, business plans. Given the early stage which the field was in at the time and its narrow focus regarding content, it is impressive to see Dana (1987) discussing the educational effects of

	entrepreneurship education, i.e. entrepreneurship education can increase student awareness and enhance the ability to learn from experience.
<i>Results</i>	Little uniformity regarding content and target groups. Empirical research has increased but is still in an exploratory stage: Very few studies use sufficiently rigorous evaluation methodologies and few studies draw on existing theory and use pre-defined hypotheses. Management theories are prevalent. The field could benefit by focusing more on primary and secondary level with underlying theories from educational science. Educational initiatives should focus on attributes, skills and tasks, and there should be an element of concrete experience derived from active participation through projects. Content should be directed at the stage of venture development and emphasise functional integration.

<i>Pittaway &amp; Cope (2007)</i>	
<i>What/When</i>	A systematic literature review including 185 articles from 61 journals, covering the time period 1970-2004.
<i>How</i>	The articles are categorised according to four dimensions: 1) General policy climate; 2) University context; 3) Educational offerings (both curricular and extra-curricular); 4) General infrastructure. The educational offerings are divided into four subcategories: 1) The teaching of entrepreneurship; 2) The role of management training for entrepreneurs; 3) The role of the enterprising university; 4) Student entrepreneurship.
<i>Why</i>	The review was performed in connection with the establishment of the National Council for Graduate Entrepreneurship (2004), and many of the themes are aligned with prior analysis and thematic reports performed within this project. It aims to provide evidence-based underpinnings for entrepreneurship education policy.
<i>Focus</i>	Increased focus on the importance of studying graduate careers and of mapping supply and demand of entrepreneurship education. The importance of EE is recognised for its potential for cross-fertilization of methodologies from different domains. Focus on how EE can increase its impact by taking internal entrepreneurial projects into real business. Not only focus on start-ups but also on graduates' perception of working in SMEs and SMEs perceptions of graduates.
<i>Outcome variables</i>	Not much focus on competences. Mostly venture creation specific and broad, such as feasibility. More focus on personality traits, demographical variables, attitudes, intentions and desirability.
<i>Teaching methods</i>	Multiple articles included in the review focus on the teaching methods in EE. Interaction between students and entrepreneurs, teamwork, internships, placements and mentoring, student consulting projects with small firms, experiential learning, action learning, new venture simulations, development of actual ventures, skills-based courses, experiential learning. The role of theory in this practice-oriented field, how students can function as a local resource-base, the roles of culture and institutional climate. The interest in using technology has increased: E-mentoring, video role-plays, technology based simulations. A concern regarding the lack of uniformity regarding methods for teaching entrepreneurship and what "entrepreneurship" actually is.
<i>Results</i>	It might be important to move from a period of growth to a period of reflection. The definitional and conceptual uncertainty that has characterised the field is still present, and the limited clarity of what the outputs should be leads to significant

	<p>diversity surrounding the inputs. A call for the development of detailed taxonomies and typologies.</p> <p>Discussions on pedagogy have occurred in isolation from other wider debates on learning theory, graduate employment, and the links between entrepreneurship education and graduate entrepreneurship. The topic's legitimacy should not merely be based on economic utility but also on questions such as: does it create a better society? Too little focus on policy and its links to institutional strategies.</p> <p>An increasing number of empirical studies, but many of them lack clear theoretical foundations related to learning or education. The evidence does not provide an indicative evidence base, because it is fragmented and emergent, lacking a developmental nature. Call for more cross-institutional, comparative and longitudinal studies. Much of the research is carried out in isolation from other important research fields such as adult learning, management learning, higher education policy, graduate employment, labour markets. The focus on short-term impact needs to be transformed to a focus on long-term impact, since links between for example intentionality and behaviour is not yet established. It is important to not lump together all programmes in the field and perform a general analysis on them. It is important to consider the context of the programmes and their effects.</p>
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<i>Nabi et al., (2017)</i>	
<i>What/When/How</i>	159 articles from 2004 to 2016.
<i>How</i>	<p>A teaching model framework, which is based on the work of Bechard &amp; Gregoire (2005) and Fayolle &amp; Gailly (2008). Divided into four pedagogical categories: 1) Supply model focusing on reproduction methods such as lectures, reading, and so forth (behaviourist); 2) Demand model focusing on personalised/ participative methods such as interactive searches and simulations (subjectivist); 3) Competence model focusing on communication, discussion, real life situations and production methods, for example debates and portfolios (constructivist); 4) Hybrid models (i.e., mixture of above).</p> <p>They also apply an impact classification system that is a variant of Kirkpatrick's (1959) classification framework and builds on work by Block &amp; Stumpf (1992), Henry, Hill &amp; Leitch (2003), Jack &amp; Anderson, (1998). The following five levels are used:</p> <ul style="list-style-type: none"> <li>• Level 1: Current and on-going measures during the programme (e.g., interest and awareness).</li> <li>• Level 2: Pre- and post-programme measures (e.g., knowledge, entrepreneurial intentions).</li> <li>• Level 3: Measures between 0 and 5 years post-programme (e.g., number and type of start-ups).</li> <li>• Level 4: 3 to 10 years post-programme (e.g., survival of start-ups).</li> <li>• Level 5: 10 years plus post-programme (e.g., contribution to society and economy).</li> </ul>
<i>Why</i>	To start rigorously examining relationships between pedagogical methods and specific outcomes it is necessary to systematically review empirical evidence on the impact of EE in higher education concerning a range of entrepreneurial outcomes.
<i>Focus</i>	An overwhelming focus on entrepreneurial intentions. An increase in empirical studies, but the use of short-term indicators is still prevalent. The evidence for the influence of EE is inconclusive. Some studies demonstrate that there is a positive influence, others show no support and others demonstrate a negative influence.

	<p>These conflicting results have been attributed to methodological issues by many researchers. The authors point to the problems that many assessment studies do not describe the educational initiatives in detail. They point out that programmes with different teaching methods and target groups can have very different outcomes. It can also depend on context or the contextual background of the participants. We have considerably more knowledge about the general influence of entrepreneurship education on intentions than about the moderating role of gender or context-specific patterns.</p> <p>Since the last review, quantitative meta-analyses (Martin et al. 2013; Bae et al., 2014) have been performed showing that, on average, entrepreneurship education seems to have a positive influence. However, as the authors of these studies themselves point out, many of the studies included experienced methodological issues. Many studies in the field still lack a clear theoretical framework. Still a strong focus on the field's development. EE is viewed as an important ingredient in job creation and graduate business start-ups, and economic growth, but few studies actually support these claims.</p>
<i>Outcome variables</i>	<p>Since this review focuses on assessment studies, multiple articles contain suggestions for various competence-oriented outcome variables such as: uncertainty and ambiguity tolerance, sense of psychological ownership, internal self-reflection and social engagement, sense of responsibility, independent thinking, and connecting to one's own and others' needs, social capital and socioeconomic bonds.</p>
<i>Teaching methods</i>	<p>Since the article focuses on assessing the impact of various teaching approaches, it is somewhat surprising that it only includes a fairly limited number of articles discussing teaching approaches. There are some examples, but most are venture creation oriented: student-led entrepreneurship clubs, network events and interaction with entrepreneurs, realistic entrepreneurial exercises, starting and running a "real", problem-based learning, dealing with real-world problems or opportunities in industry-engaged environments.</p> <p>Some articles use a comparative evaluation method: Lange et al. (2014) suggest that experiential courses (featuring demand and competence models) better predict multiple entrepreneurial behaviours. The rare behaviourist courses in their study ("how to write a business plan") are essentially a negative predictor. Walter and Dohse (2012) compare active learning (constructivist) to traditional learning (behaviourist). They find the constructivist model to have a stronger impact in terms of entrepreneurial intention.</p>
<i>Results</i>	<p>Assessment studies within the field are still predominantly focused on short-term and subjective outcome measures. The different outcomes of programmes assessed in various studies should not only be attributed to methodological issues but also to different in pedagogical approach and target group. They thus reconfirm past reviews that emphasise the importance of context, and argue that teaching methods and target groups are of central importance when understanding results of impact research. Important to align the assessment measures/methods with the learning goals of the programmes. Call for an increased focus on the participants' contextual background (gender, culture, entrepreneurial experience) and an increased number of comparative assessment studies.</p> <p>Call for an increased focus on novel impact indicators related to emotion and mindset and an increased focus on the intention-to-behaviour transition and the role of commitment and identity in this process. The role EE plays in the process of personal</p>

	<p>development beyond knowledge and skill acquisition, such as change in thinking style, internal self-reflection, and external engagement.</p> <p>They argue that, although the evidence is scarce in the articles they have reviewed, there is an indication that pedagogical methods based on competence are better suited for developing higher-level impact. These deeper, more experiential, pedagogies seem to have the most potential to have an impact at higher levels, because students focus on developing behavioural competency in solving problems in real-life entrepreneurial situations.</p>
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<i>Henry et al., 2005a,b</i>	
<i>What/When/How</i>	A two-part paper where neither theoretical perspective or methodology is applied and presented. No structure regarding which papers that should be included. The only criteria is whether it contributes to the thematic discussion.
<i>Why</i>	To examine and discuss whether or not e'ship can be taught and how this can be assessed.
<i>Focus</i>	<p>The field does not have an overarching theory and is still in its infancy characterized by continues conceptual and methodological debates. Research has run ahead of theoretical developments, and there has been a bias towards ad hoc research without theoretical underpinnings. The content of syllabi of courses differs to such an extent that it is difficult to determine if they even have a common purpose. While e'ship has to do with a process of change, emergence and the creation of new value, it is also a process of change and creation for the entrepreneur. EE could have an impact on many more than just individuals who want to start-up a new organization. Such learning could have benefits for society.</p> <p>There is a considerable debate over the most appropriate method of measuring the effectiveness of e'ship programmes with no standard methodological approach to evaluation, nor does there exist a common set of evaluation criteria for determining effectiveness. This clearly presents problems for evaluators and further complicates the debate surrounding whether or not e'ship can be taught. There is a clear need to evaluate EE programmes over time. Designing a methodology to evaluate EE is comparatively easy, it is more difficult to ensure that the approach adopted is actually valid. One means by which to measure the effects is to employ a model such as that advanced by Jack and Anderson (1998). They have developed a five step framework for assessing the effectiveness of e'ship education and training programmes, which is based on an earlier version developed by Block and Stumpf (1992).</p>
<i>Outcome variables</i>	<p>A primary objective of training interventions targeted at the awareness stage of entrepreneurial development is the promotion of self-efficacy with regard to new venture creation. The most commonly cited aims of EE include: to identify and stimulate entrepreneurial drive, talent and skills, to undo the risk-averse bias, develop analytical techniques, empathy and support for all unique aspects of e'ship, and to devise attitudes towards change.</p> <p>Technical skills: written and oral communication, technical management and organizing skills.  Business management skills: planning, decision-making, marketing and accounting skills.  Personal entrepreneurial skills: inner control, innovation, risk taking and innovation. Skills such as inner control, risk taking, innovativeness, being change oriented, persistence and visionary leadership, differentiates an entrepreneur from a manager. The entrepreneur can be defined in terms of attributes, and the small business owner or manager in terms of tasks</p>
<i>Teaching methods</i>	The educational initiatives need to be adjusted to target audience. The training needs of an individual will vary according to a particular stage of development such as awareness, pre start-up, start up, growth and maturity. Entrepreneurship itself is not usually what is taught; rather, it is small business management skills that are provided.

	<p>It is important for students to find and explore the wider concepts relating to a problem; to learn by overcoming failure; to develop more independence from external sources of information and expert advice; and to think for themselves.</p> <p>A three-category framework to organize EE: education <i>about</i> enterprise (awareness creation and theory), education <i>for</i> enterprise (preparation of aspiring entrepreneurs) and education <i>in</i> enterprise (management training for established entrepreneurs).</p> <p>There is a limit to what can be taught in EE. Analytical thinking, accounting, finance, marketing, management information systems and manufacturing are among those aspects of entrepreneurship that can be taught. More critical skills such as judgement, handling people, patience and responsibility cannot be taught directly and can only be learned in the real world. The quality of the resulting business plan as a key measure of effective experiential learning. However, the business plan is also debated, despite the fact that it appear to be a common element in most EE programmes. Excessive focus on the business plan may inhibit entrepreneurial response to subsequent changes in the environment.</p> <p>The less traditional use of case study, role-play, simulation and problem solving teaching methods can be questioned since, in the confines of the classroom where guidelines are provided and outcomes are known, such mechanisms are actually promoting logical rather than creative or entrepreneurial thinking. When comparing the case method with the project method the latter were more effective. The learning emphasis in educational establishments is on the past, with a focus on the understanding, feedback and analysis of large amounts of information. The entrepreneur is focused on the present, with little time for critical analysis.</p>
<i>Results</i>	<p>Despite the growth in EE the paper reports that little uniformity can be found. Attention is drawn to the art and the science of entrepreneurship, with the consensus that at least some aspects of entrepreneurship can successfully be taught. <i>Science</i> refers to what is teachable, and the art refers mainly to what is not.</p>

Mwasilviba, 2010	
<i>What/When</i>	108 articles from 1982-2009
<i>How</i>	A semi-systematic literature review with an attempt to reduce the author's bias. Reviewed in stages and by categorising in terms of 1) <i>educational objectives</i> , 2) <i>target audiences</i> , 3) <i>community outreach activities</i> , 4) <i>applied teaching methods</i> and 5) <i>impact indicators</i> .
<i>Why</i>	<p>Aims to take stock of existing publications devoted to EE and assess the alignment existing between its generic objectives, target audience, teaching methods and impact indicators. (1) What are the perceived meaning, definition and objectives of EE? (2) What are the types, contents and target audiences of EE? (3) What are the most advocated teaching methods? What are the applied teaching methods? (4) What role does EE play for local entrepreneurs, local communities and to the society? (5) How do trainers and researchers assess the impact? What indicators do they use?</p> <p>Categorisation according to: 1), the specific objectives, 2) to support local communities, 3) its forms, type of courses, target groups and outreach projects, 4) the applied teaching methods and community outreach activities, 5) the success indicators and methods for evaluation and impact measurement.</p>
<i>Focus</i>	<p>Convergence towards a single framework of EE. A shift from a start-up view to an attitude-changing perspective. A diversity of target groups, still a non-alignment between what educators and stakeholders wish to achieve. Crucial definitional issues, especially on the most pivotal terms like e'ship itself, enterprise, and who is an entrepreneur, and a confusing application of terms like "e'ship education" and "enterprise education". This have far-reaching effects on the understanding of the objectives of e'ship as field of study, the setting of specific course objectives, the choice of target audiences, the design of course content, the</p>

	<p>teaching methods applied, and ultimately on evaluating progress and on the design of impact assessment frameworks. It is possible to group e'ship programs in terms of their focus, level of education, and target audience. Also important to non-business students and other vocational disciplines like engineering.</p> <p>The goal in impact assessment is to "prove the effects" and later improve the intervention. An evaluation entails a review of both students and the programme to measure either quality or progress. Measuring effect (impact) means looking for causality, which is quite a separate process to that of measuring progress and quality (evaluation). For instance, evaluations are based on a set of standards as a benchmark, whereas impact assessment draws its basis from the predetermined objectives of an intervention.</p>
<i>Outcome variables</i>	<p>The outcomes identified are typically both relevant for a narrow definition as well as a broad. Venture creation is still the main preferred impact indicator, although addressed in a different way (the attitudinal way), followed by students' academic standards (including examination scores and GPAs). Many psychological dimensions and self-efficacy oriented constructs are deemed as being important, such as: Recognize opportunities, knowledge and skills to act on it, entrepreneurial attitudes, self-esteem, spirit and culture need of achievement, locus of control.</p> <p>The reliability of intentions is questioned as one study demonstrated that it changed highly over a period of just 18 months, which makes impact assessment conclusions (especially those taken immediately after the completion of the course) based on this tentative at best. A set of quality or progress indicators for EE should be relevant to policy makers, valid and able to measure the condition accurately, reliable, easy to interpret and understand, and able to provide timely information. Each indicator should be logically connected to other indicators.</p>
<i>Teaching methods</i>	<p>A framework including four dimensions is proposed: Educating 1) <i>for</i> (prepare for venture creation), 2) <i>about</i> (theory), 3) <i>in</i> (become entrepreneurial in their place of work) or 4) <i>through</i> (of a teaching approach) e'ship.</p> <p>The most taught subjects are: (1) resources marshalling and finance; (2) marketing and salesmanship; (3) idea generation and opportunity discovery; (4) business planning; (5) managing growth; (6) organisation and team building; (7) new venture creation; (8) SME management; (9) risk and rationality.</p> <p>The three most used methods are: (1) lectures; (2) case studies; and (3) group discussions. Not as common: business/computer or game simulations; video and filming; role models or guest speakers; business plan creation; project works; games and competitions, setting of real small business ventures, workshops, presentations and study visits; internship; consulting projects with local entrepreneurs. It is best done using some kind of apprenticeship; doing something practical and having an opportunity to question, investigate, converse, and discuss with real-world entrepreneurs. Most active/action-based teaching methods are costly and may not align to the conventional university system. The question thus is: is it a matter of proper choice of subjects (i.e. what to teach) or of teaching methods (i.e. how and who to teach it), or both?</p>
<i>Results</i>	<p>Although there is no consensus in the basic definitional issues, there is a common understanding of what EE is generally attempting to achieve.</p> <p>Too much educational effort has been directed to producing entrepreneurs and less has been directed towards the study of the institutional environments in which graduates are going to operate. There is also a need for further research on the performance of e'ship graduates in workplaces.</p>

<i>Hägg &amp; Gabrielsson, 2017</i>	
<i>What/When</i>	334 articles from 1980 to 2017 in 62 academic journals

<i>How</i>	A “who-is-doing-what-for-whom-and-how” framework that focus on instructors (who), content (what), target (for whom) and teaching methods (how).
<i>Why</i>	To understand how the field of EE has developed over four decennia.
<i>Focus</i>	<p>E’ship research has been highly successful in becoming an established and legitimate field of academic research. However, EE remains a young and fragmented field of research where scholars continue to debate what focus this form of education should have. Some courses focus specifically on “start-up” e’ship, other courses cover various aspects related to operating and running a small growing business, while yet others focus more on developing entrepreneurial attitudes and behaviours. In order to increase the legitimacy, various conceptions relate to the issue of pedagogy should be discussed, since these determines teacher practices, learner roles, and expected learning outcomes.</p> <p>Most studies remain descriptive without any explanation of the underlying learning process theories. Nevertheless, EE represent one of the most progressive and innovative forms of teaching where students have been confronted with action-oriented pedagogies that engage them in writing business plans, developing products, services and business models, and starting up real-live ventures.</p> <p>The field has experienced an immense development from the 1980’s. The number of published articles on EE has grown exponentially. The balance between conceptual and empirical contributions is fairly stable over time, except during the last period (2010-)when empirical studies have increased in scope. The number of articles that are theoretically grounded is also increasing over time.</p> <p>During the 1980’s, the primary focus was on delivering knowledge about e’ship and curricular development. The research was much influenced by contemporary management theories. Courses in the topic experienced a large degree of homogeneity. There was an implicit belief that students interested in e’ship would self-select. This changed during the 1990’s where focus on student learning increased.</p> <p>The spiritual dimension is more explicit in the pedagogical debate on teaching content in the 2000s, with a focus on know-why and know-when. There is an increasing use of research findings in teaching. A widespread use of practicing entrepreneurs in the classroom as a way to bridge theory and practice. The theoretical dimension becomes more apparent in the debate in the 2010s. EE is becoming more diverse. Two distinct paths seem to emerge in the debate: a more specialized which targets specific segments of students (intrapreneurship, technopreneurship, social entrepreneurship, etc.) and a broader ‘entrepreneurial’ path that is targeting the entire population of students, and which aims to develop their entrepreneurial knowledge, skills, and attitudes regardless of their future occupation.</p>
<i>Outcome variables</i>	Hägg & Gabrielsson do not focus specifically on outcome variables in their review, but they discuss the challenges that accompany assessment studies within the field. Assessment practices have not developed in the same pace as new teaching methods, and it is important to make comparison of pedagogies and best practices across institutional contexts. The outcome of EE is context dependent, and there is a lack of theoretically grounded and methodological sound evaluation and assessment frameworks that can substantiate the impact of EE across different contexts and programs.
<i>Teaching methods</i>	The field has developed from using a traditional didactic approach during the 1980’s and 1990s to more experience-based learning and process driven pedagogies in the 2000’s and 2010’s. It has developed from focusing on traditional lectures, cases, use of business plans, and simulations in the 1980’s and 1990’s, to a focus on effectuation logic, design-based thinking and the business model canvas in the 2000’s and 2010’s. Overall, the focus has moved beyond definite discussions of what to teach in the classroom towards how teaching content may stimulate learning among students.

	<p>However, already early on it was recognized that traditional teaching methods do not fit EE. Instead, there is an emphasis on “taking action” by including experiential exercises and working with or alongside actual entrepreneurs, should be used. The use of guest lectures and involvement of industry has been popular from the start, but it has become more sophisticated and the focus is now more on what students learn when engaging in authentic assignments and practice-oriented education.</p>
<i>Results</i>	<p>The field has also moved beyond traditional start-up conceptions of entrepreneurship. However, action oriented and practice based approaches have raced far ahead of theory. This has led to calls for a critical stance towards their pedagogical and theoretical roots. The role of action, experience and reflection for learning are today more intensely discussed. Overall, there has been a shift from how to teach entrepreneurship towards how students can learn valuable lessons for life through EE.</p> <p>There is no theoretical framework that can provide proper guidance with respect to appropriate contents and teaching methods for different kinds of EE. Instructors have to understand and decide themselves which pedagogical approaches that may best suit their teaching contexts.</p> <p>There are very few “bridging” scholars that make contributions in both EE and e’ship in general. There is today limited cross-fertilization between the research communities in terms of knowledge transfer and theoretical integration, especially with regards to the lessons learned from e’ship research and its implications for EE.</p> <p>There are few theoretical insights about the role of the instructors and how their perceptions and teaching philosophies influence their students. Fairly little is known about how research active academics vis-a-vis practicing professionals facilitate different kinds of learning outcomes, and whether differences in levels and forms of education, categories of learning outcomes, and the specific focus of the course or program also calls for different instructor competencies.</p> <p>There are few comparative studies and longitudinal studies of EE. The effectiveness and impact of various forms and methods of teaching has for a long time been largely unquestioned in research on EE, but this is now increasingly emphasized as a key area of inquiry.</p>

<i>Shepherd et al., (forthcoming)</i>	
<i>What/When</i>	918 articles published in 2001-2017 in 9 top-ranked journals in entrepreneurship and management research have been reviewed
<i>How</i>	The focus is on dependent variables (DVs) used in e’ship research. The scope is thus very broad and only briefly touch upon EE. The DVs are divided into four categories, three stage-based process categories and one context-oriented category: (a) initiation, (b) engagement, and (c) performance of entrepreneurial endeavours embedded in (d) environmental conditions, in which an entrepreneurial endeavour is the investment of resources into the pursuit of a potential opportunity.
<i>Why</i>	A bottom-up approach is applied where topics that are deemed as being important outcomes of entrepreneurial activities by researchers within the field are identified. The goal is to understand what researchers within the field consider to be of interest.
<i>Focus</i>	Due to this review’s broad focus it was necessary the focus to the categories that more aligned with goals of educational initiatives, i.e. initiation and engagement. Multiple psychological DVs have received a large interest and are divided into six categories: 1) entrepreneurial cognitions about opportunity, 2) entrepreneurial cognition on other initiations, 3) entrepreneurial intention, 4) entrepreneurial motivation, 5) entry, and 6) distinctive groups of initiating endeavours.

	<p>How and where to search for opportunities, and when to stop searching for them and how to generate them, have received a lot of focus. This is also the case for intentions even if its link to actual entrepreneurial behaviour has been highly criticised. Entrepreneurial motivation (such as wealth creation, social or environmental value, or to make a change in the world by creating something new) as well aspirations (development, growth), and commitment (affective, grit, perseverance) have also received a lot of focus.</p> <p>Emotional and social outcomes, both positive such as trust, perceptions of relational support, passion, global life satisfaction, job satisfaction, pay satisfaction, and quality of life, and, peak experience, peak performance, and flow, as well as negative, such as envy, grief over failure, stigma, fear of failure, or even as an addiction in case of serial e’ship, was also common DVs. DVs for the engagement of entrepreneurial endeavours (the cognitive, affective, behavioural, and/or organizational activities of involvement in the process of exploiting a potential opportunity) include outcomes related to (1) engaged decision making, (2) acquiring and allocating resources, (3) entrepreneurial organizing, (4) commitment, affect, and well-being; (5) engaged learning; and (6) innovative orientation, inputs, and outcomes.</p> <p>Decision making and entrepreneurial judgment are DVs for which researchers have focused on both positive outcomes (the speed and accuracy of decision making, ethical decision making, moral imagination and identity) but also negative outcomes (susceptibility to status quo bias, hindsight bias, over-optimism, over-confidence, rule breaking, moral disengagement, and informal e’ship).</p> <p>One major cross-category is legitimacy, with articles about topics such as: narrative strategies, meta-narratives, professionalization, acquisition of status, identity, use of persuasive rhetoric, presentation of appropriate scenes to stakeholders and the visual symbols. Related to this theme is research about networks.</p> <p>A firm level DV that has received a lot of interest is <i>entrepreneurial orientation (EO)</i>. A DV related to EO that lately has received high level of attention is <i>pivoting</i>.</p>
<i>Outcome variables</i>	<p>Multiple competences have been identified as being important to entrepreneurs and entrepreneurial activities, such as: alertness to opportunity and its formation, willingness to accept risk and/or uncertainty, tolerance for high stress, how and where to search, ability to sustain confidence, flexibility to adapt, skilful use of persuasive language.</p> <p>A high degree of focus has also been paid to psychological constructs such as: entrepreneurial self-belief, entrepreneurial self-image, the use of effectual logic vis-à-vis causal logic, the use of intuition, metacognition, and entrepreneurial decision making as both judgment selectiveness (i.e., discernment between factors) and conviction (i.e., the strength of the causal map), sensemaking and emotion regulation.</p>
<i>Teaching methods</i>	<p>There is very limited focus on education in this review, and therefore very few articles discuss teaching methods. However, there are some elements discussed that may be of interest, such as: failure as a context for learning, the use of structural alignment processes, emotion regulation, and narrative accounts of failure by entrepreneurs and stakeholders.</p> <p>Some social learning by entrepreneurs is also discussed: entrepreneurs can learn from peers, from co-workers, within a venture’s management team, across ventures, through knowledge acquisition, improvisation in teams, from competitors, through innovation and knowledge integration. The authors also not that: A more in-depth understanding of the opportunity emergence increases the chance for us (as educators) to teach how to engage in this process more successfully, proceed through the process more quickly, and engage others in facilitating the process.</p>
<i>Results</i>	<p>The authors point-out multiple avenues for future research based on their four themes. In this review we focus on 6 of these:</p>

*Opportunities:* Exploitation of opportunities can be considered on a continuum or as multiple steps, but how does this exploitation emerge? How do collectives evaluate opportunities, and why do some entrepreneurial teams generate different assessments than others? Similarly, how do groups formulate beliefs? Sensemaking can also be an interesting avenue since it is connected to focus on different mindsets, such as entry and exit mindsets.

*Decision-making:* With a process-oriented approach it would be possible to explore the decision making of the multiple parties involved in an outcome, the sequence of those decisions, and the dynamism of the process, both professionally, but also personally and investigate how entrepreneurs' goals related to their businesses mesh with goals in their private lives and how both change over time.

*Entrepreneurial learning:* Why do some entrepreneurs learn more from their experience than others, and how do they do it? While we are gaining a deeper understanding of the actions and cognitions that lead to learning, more can be done to identify and explain the learning tools entrepreneurs use, the contexts that facilitate or obstruct the use of these learning tools, and the processes of collective learning, all of which are in an environment characterized by high uncertainty, high dynamism, and considerable time pressure. What concepts and relationships constitute entrepreneurs' (individually and as a team) cognitive maps, how do these cognitive maps change with the pursuit of potential opportunities, and how does this learning manifest itself in subsequent entrepreneurial action? Explore mutual social learning, particularly around the co-creation of a potential opportunity. The entrepreneur is likely to learn from the funding team, and both are likely to learn from the organization they build.

*Entrepreneurial employees:* There are also ample avenues to further study entrepreneurial employees and their importance to start-ups. The authors were unable to identify articles related to stakeholder related performance which were examining employees' performance as an outcome. Particularly in growing and knowledge-intensive firms, it appears that employees are extremely important stakeholders and their performance is a critical proximal outcome.

*Context and legitimacy:* When it comes to studying the context there are also multiple avenues of interest, such as: the paradox of embeddedness, i.e. if institutions are so cognitively overpowering, how is it that some actors can identify opportunities for change? The way legitimation processes change as an entrepreneurial venture matures. An important shift in understanding legitimacy first as a property or capacity of an entrepreneurial venture to an emerging new characterization of legitimacy as a process.

*Negative emotions:* The authors underline that the interest for the "dark side" of e'ship has increased. Entrepreneurship can spur both positive and negative emotions, and it is important to increase our understanding about how entrepreneurs are coping with failure, but also to get more insights into unproductive entrepreneurship as well as informal entrepreneurship.

*Conclusion:* The authors conclude that performance is a popular category of DVs, but its dominance appears to be waning. It is interesting to note that people initiate, engage in, perform, and leave, entrepreneurship for a whole host of different reasons. However, while psychology-based studies have been contributing to our knowledge of entrepreneurship for some time (and increasingly so), it appears that the sociological perspective has entered and is gaining momentum as reflected in the growth of DVs related to institutions and legitimacy.

## Extended summaries of the literature reviews

<i>Dainow (1986)</i>	
<i>What/When/How:</i>	The review by Dainow reflects the field's low level of maturity during the time period in which it was performed. The focus was broad; it was not only limited to academic journals (18), but also included government documents and conference proceedings. The review covers a 10-year period ending in 1984.
<i>Why</i>	In order to guide future research efforts, as well as practical efforts, within the field, it is necessary to assess publications within the field and identify state of the art as well as strengths and weaknesses.
<i>Focus/ Outcome variables /Teaching methods/Results</i>	Overall, there has been a significant development in the field, both based on the quantity as well as the quality of articles. However, the field could benefit from cross-fertilising with related fields such as education and instructional design. An increased focus on evaluating outcomes of educational initiatives within the field is necessary in order to build an empirical base. Educational initiatives and evaluations should have a specific focus on target audiences. Overall, it is necessary to increase knowledge about the field by systematic data collection and by applying more varied methodologies.

<i>Gorman, Hanlon &amp; King (1997)</i>	
<i>What/When/How</i>	Gorman with colleagues categorise all the papers according to whether their focus is theoretical or empirical. In addition to this, they categorise them according to target market (enrolled students, out-of-school potential entrepreneurs, business owners, others) and content, which mostly focuses on stages of development in a venture process (entrepreneurial propensity; pre start-up; post start-up, educational processes and structure). 92 journal articles from seven high ranked entrepreneurship journals, covering the time period 1985-1994, are reviewed.
<i>Why</i>	Assess the state and development of research in the field of entrepreneurship education.
<i>Focus</i>	<p>Much of the literature during this time period focuses on education in new venture creation, that is, a narrow definition of the purpose of educational initiatives within the field is applied. There are some discussion about whether educational initiatives should come at an early stage (Gasse, 1985; Filion, 1994) or only at tertiary level (Chamard, 1989).</p> <p>Many papers discuss the importance of aligning the educational initiative with the stage of venture development at which the target audience currently find themselves (Gibb, 1994; McMullan &amp; Long, 1987; Plaschka &amp; Velsch, 1990), and how educational initiatives could be tailored to fulfil the needs of organisations rather than personal needs (Wright, 1994).</p> <p>There is also a strong focus on the immense growth within the field, and many articles focus on how it has emerged as an academic discipline (Ivancevich, 1991; McMullan &amp; Long, 1987; McMullan, 1988; Plaschka &amp; Welsh, 1990; Ronstadt, 1987). Some articles argue for the necessity of either reforming the business schools in order to give more prevalence to entrepreneurship (Vesper et al, 1989) or for the necessity of entrepreneurship leaving the management field and developing as an independent academic discipline (Kao, 1994).</p>
<i>Outcome variables</i>	Multiple articles discuss which competences educational initiatives should focus on, for example: Negotiation, leadership, creative thinking, exposure to technological innovation, new product development (McMullan & Long, 1987), opportunity

	identification, strategy development, resource acquisition, implementation (Knight, 1991), creativity and multidisciplinary focus (Plaschka & Velsch, 1990), ability to impact one's personal environment, high degree of self-confidence, ability to create support network, create linkage between vision and action (Johannisson, 1991), marketing, leadership, creativity, personality (Hood & Young, 1993).
<i>Teaching methods</i>	Fairly few articles discuss which teaching methods to apply, and many of them have issues with methodological rigor. The use of cases and projects (McMullan & Boberg, 1991) and project-based learning (Preshing 1991) as well as small teams and business plans (Gartner & Vesper, 1994) are discussed. Given the early stage which the field was in at the time and its narrow focus regarding content, it is impressive to see Dana (1987) discussing the educational effects of entrepreneurship education. He argues that since the entrepreneurial learning style preference is consistent with active participation, which increases the opportunity to participate in the classroom, entrepreneurship education can increase student awareness and enhance the ability to learn from experience.
<i>Results</i>	Many articles identify the growth of entrepreneurship programmes, but there is little uniformity regarding content and target groups. Empirical research has increased but is still in an exploratory stage: Very few studies use sufficiently rigorous evaluation methodologies. It is also the case that very few studies draw on existing theory and use pre-defined hypotheses. The few theories that are used lack multidisciplinary focus. Management theories are prevalent, even though theories from both educational science and psychology have the potential to enrich the field. The field could benefit a lot by focusing more on primary and secondary level with underlying theories from educational science. The authors argue that, based on the review, educational initiatives should focus on attributes, skills and tasks, and there should be an element of concrete experience derived from active participation through projects. Content should be directed at the stage of venture development and emphasise functional integration.

<i>Pittaway &amp; Cope (2007)</i>	
<i>What/When/How</i>	The exploration of themes was performed by applying a systematic literature review (SLR), which increases the transparency of the process. It includes 185 articles from 61 journals, covering the time period 1970-2004. The articles are categorised according to four dimensions: 1) General policy climate; 2) University context; 3) Educational offerings (both curricular and extra-curricular); 4) General infrastructure. The educational offerings are divided into four subcategories: 1) The teaching of entrepreneurship; 2) The role of management training for entrepreneurs; 3) The role of the enterprising university; 4) Student entrepreneurship.
<i>Why</i>	The review was performed in connection with the establishment of the National Council for Graduate Entrepreneurship (2004), and many of the themes are aligned with prior analysis and thematic reports performed within this project. It aims to provide evidence-based underpinnings for entrepreneurship education policy.
<i>Focus</i>	There is an increased focus on the importance of studying graduate careers (Dyer, 1994; Katz, 1994; McMullan & Gillin, 1998; McLarty, 2003; Rosa, 2003) and of mapping supply and demand of entrepreneurship education (Birley & Gibb, 1984; Matlay, 2001). The importance of entrepreneurship education is recognised for its potential for cross-fertilization of methodologies from the student entrepreneurship education domain into the management training domain (Katz, 1991; Solomon &

	<p>Fernald, 1991; Dana, 1992; Solomon &amp; Weaver, 1994; Vesper &amp; Gartner, 1997; Katz, 2003).</p> <p>There is a focus on how entrepreneurship education can increase its consecutive impact by taking internal entrepreneurial projects into real business (Klofsten, 2000; Robertson &amp; Collins, 2003). In addition to this, the focus is not only on start-ups but also on graduates' perception of working in SMEs (Belfield, 1999; Brindley &amp; Ritchie, 2000; McLarty, 2003) and SME owner-managers' perceptions of graduates (Brindley &amp; Ritchie, 2000; Stewart &amp; Knowles, 2000; Pittaway &amp; Thedham, 2005).</p>
<i>Outcome variables</i>	<p>There is not much focus on competences in this review, but some highlighted studies have investigated how personality traits influence attitudes, which in turn influence intentions (Hatten &amp; Ruhland, 1995; Koh, 1996; Luthje &amp; Franke, 2003). They also investigate how demographical variables such as gender, age and family experience influence perceptions of entrepreneurship and consecutive behaviour (Hatten &amp; Ruhland, 1995; Wang &amp; Wong, 2004; Scott &amp; Twomey, 1988; De Martino &amp; Barbato, 2003). Rather than outlining specific competences, they are grouped into categories such as desirability and feasibility, and it is analysed how entrepreneurship education can influence these (Hansemark, 1998; Peterman &amp; Kennedy, 2003).</p>
<i>Teaching methods</i>	<p>Multiple articles included in the review focus on the teaching methods in entrepreneurship education, such as interaction between students and entrepreneurs (Brindley &amp; Ritchie, 2000), internships, placements and mentoring (Kirby, 1998; Stewart &amp; Knowles, 2003; Westhead et al., 2000), and how these methods can lead to enhanced awareness of entrepreneurship (Ridder &amp; Van der Sijde, 2003) and enable experiential learning (Carson, 1985; Chan &amp; Anderson, 1994; Wani et al., 2004).</p> <p>There is a strong focus on practice-oriented teaching methods such as action learning (Leitch &amp; Harrison, 1999), new venture simulations (Clouse, 1990; Kelmar, 1992), development of actual ventures (Haines, 1988), skills-based courses (Ulijn et al., 2004), experiential learning (Sexton &amp; Upton, 1987; Daly, 2001), teamwork and mentors (Macfarlane &amp; Tomlinson, 1993). However, there are also articles discussing the role of theory in this practice-oriented field (Fiet, 2001a,b).</p> <p>Many articles focus on student consulting projects with small firms (Hollingsworth et al., 1974; Sonfield, 1981; Holoviak &amp; Ackelsberg, 1983; Chan &amp; Anderson, 1994; Brindley &amp; Ritchie, 2000) as well as how students can function as a local resource-base (Hollingsworth et al., 1974; Sonfield, 1981; Wayne &amp; Ontani, 1988). The roles of culture and institutional climate are also discussed (Carayannis et al., 2003; Klapper, 2004).</p> <p>The interest in using technology in educational settings has increased, and the use of E-mentoring (Ridder &amp; Van der Sijde, 2003), video role plays (Roberson &amp; Collins, 2003) and technology based simulations (Low et al., 1994; Hindle, 2002) is discussed in many articles.</p> <p>There is still a concern regarding the lack of uniformity regarding methods for teaching entrepreneurship (Porter, 1994), which is linked to the confusion regarding what "entrepreneurship" is (Gartner &amp; Vesper, 1994).</p>
<i>Results</i>	<p>The authors argue that it might be important to move from a period of growth to a period of reflection. The definitional and conceptual uncertainty that has characterised the field is still present, and the limited clarity of what the outputs should be leads to significant diversity surrounding the inputs. The authors therefore call for the development of detailed taxonomies and typologies.</p>

	<p>They further argue that it is unfortunate to see that discussions on pedagogy have occurred in isolation from other wider debates on learning theory, graduate employment, and the links between entrepreneurship education and graduate entrepreneurship. They argue that the topic's legitimacy should not merely be based on economic utility but also on questions such as: does it create a better society? This important discussion lacks focus today due to too little focus on policy and its links to institutional strategies.</p> <p>The authors conclude that an increasing number of empirical studies have been performed, but many of them lack clear theoretical foundations related to learning or education. The effect of this is that the evidence does not provide an indicative evidence base, because it is fragmented and emergent, lacking a developmental nature. The authors call for more cross-institutional, comparative and longitudinal studies. Much of the research is unfortunately carried out in isolation from other important research fields such as adult learning, management learning, higher education policy, graduate employment, labour markets. The focus on short-term impact needs to be transformed to a focus on long-term impact, since links between for example intentionality and behaviour is not yet established. However, it is important to not lump together all programmes in the field and perform a general analysis on them. It is important to consider the context of the programmes and their effects.</p>
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<i>Henry et al., 2005a,b</i>	
<i>What/When/How</i>	A two-part paper where neither theoretical perspective or methodology is applied and presented. No structure regarding which papers that should be included, the only criteria is whether it contributes to the thematic discussion.
<i>Why</i>	To examine and discuss whether or not entrepreneurship can be taught and how this can be assessed.
<i>Focus</i>	<p>The field, as it is currently constituted, does not have an overarching theory. According to Brazeal and Herbert (1999), the study of entrepreneurship is still in its infancy and, in consequence, those working in the field continue to be engaged in conceptual and methodological debates. Research has tended to run ahead of theoretical developments, and on the other, there has been a bias towards research that has been conducted in an ad hoc way without theoretical underpinnings being developed.</p> <p>Fiet (2000a) suggests that such differentiation is actually indicative of the lack of theoretical rigour within the field of entrepreneurship. This he feels has resulted in little consensus on fundamental questions, which in turn is reflected in differing views on developing entrepreneurship courses. Indeed, the content of syllabi of courses developed by entrepreneurship scholars differs to such an extent that it is difficult to determine if they even have a common purpose.</p> <p>The focus should not only be on the organization, but also on the individual. Bygrave (1989) refers to it as a "process of becoming, rather than a state of being" (p. 21). Bruyat and Julien (2000) concur, observing that, while entrepreneurship is to do with a process of change, emergence and the creation of new value, it is also a process of change and creation for the entrepreneur.</p> <p>The authors argue that entrepreneurship education could have an impact on many more than just individuals who want to start-up a new organization, stating that "whatever their career choice or personal situation, individuals, will be able to benefit from learning an innovative approach to problem solving; adapting more readily to change; becoming more self-reliant and developing their creativity through the study of entrepreneurship. There is no doubt that</p>

	<p>in any economic climate such learning could have far reaching benefits for society. It could be argued, therefore, that the need for entrepreneurship education and training has never been greater.”</p> <p>There is a considerable debate over the most appropriate method of measuring the effectiveness of entrepreneurship programmes (Westhead et al., 2001). Indeed, there does not appear to be a standard methodological approach to evaluation, nor does there exist a common set of evaluation criteria for determining effectiveness (Wan, 1989; Henry et al., 2003). This clearly presents problems for evaluators and further complicates the debate surrounding whether or not entrepreneurship can be taught.</p> <p>Many researchers including Curran and Stanworth (1989), Gibb (1987b), Block and Stumpf (1992), Cox (1996), Young (1997) and Storey (2000), have identified the need for evaluating entrepreneurship education and training programmes. A clear need to evaluate entrepreneurship education and training programmes over time has been identified (Wyckham, 1989; Fleming, 1996; Clark et al., 1984; Barrow and Brown, 1996).</p> <p>McMullan et al. (2001) suggest that designing a methodology to evaluate programmes and courses is comparatively easy, it is more difficult to ensure that the approach adopted is actually valid.</p> <p>One means by which to measure the behaviour of participants on completion of a training course is to employ a model such as that advanced by Jack and Anderson (1998). They have developed a five step framework for assessing the effectiveness of entrepreneurship education and training programmes, which is based on an earlier version developed by Block and Stumpf (1992).</p>
<p><i>Outcome variables</i></p>	<p>Cox (1996) believes that a primary objective of training interventions targeted at the awareness stage of entrepreneurial development is the promotion of self-efficacy with regard to new venture creation.</p> <p>According to Garavan and O’Cinneide (1994), based on their European-wide evaluation of six enterprise programmes across five European countries, the most commonly cited aims of entrepreneurship programmes include: to identify and stimulate entrepreneurial drive, talent and skills; to undo the risk-averse bias of many analytical techniques; to develop empathy and support for all unique aspects of entrepreneurship, and to devise attitudes towards change... They concluded that entrepreneurship itself is not usually what is taught; rather, it is small business management skills that are provided.</p> <p>Hisrich and Peters (1998, p. 20) categorize the various skills required by entrepreneurs as follows. Technical skills: includes written and oral communication, technical management and organizing skills. Business management skills: includes planning, decision-making, marketing and accounting skills. Personal entrepreneurial skills: includes inner control, innovation, risk taking and innovation.</p> <p>Particular skills, namely inner control, risk taking, innovativeness, being change oriented, persistence and visionary leadership, differentiates an entrepreneur from a manager.</p> <p>Gibb (1987b) argue that it is important for students to find and explore the wider concepts relating to a problem; to learn by overcoming failure; to develop more independence from external sources of information and expert advice; and to think for themselves.</p> <p>It is particularly important “to clarify notions of the relationship between enterprise, entrepreneurship, business skills and personal transferable skills in developing an approach to entrepreneurship education” (Gibb, 2000, p. 16). This is despite the fact that in earlier work Gibb (1987a) clearly distinguished between entrepreneurship, enterprising behaviour and small business management. He did this by defining the entrepreneur in terms of attributes, and the small business owner or manager in terms of tasks.</p>

<p><i>Teaching methods</i></p>	<p>The educational initiatives need to be adjusted to target audience. Educational objectives, subject matter and pedagogical approach might be expected to vary depending on the nature of the target audience” (Gorman et al., 1997, p. 56). Others, including McMullan and Long (1987), Monroy (1995), O’Gorman and Cunningham (1997), Bridge et al. (1998) and van der Sijde et al. (1997), have more specifically identified that the training needs of an individual will vary according to a particular stage of development such as awareness, pre startup, startup, growth and maturity.</p> <p>Jamieson (1984) has suggested a three-category framework by which to organize entrepreneurship education. He distinguishes between education about enterprise, education for enterprise and education in enterprise.</p> <p>About enterprise, deals mostly with awareness creation, and has the specific objective of educating students on the various aspects of setting up and running a business mostly from a theoretical perspective. Indeed, enterprise modules within business and other courses at undergraduate or postgraduate level which seek “to foster skills, attitudes and values appropriate to starting, owning, managing or working in a successful business enterprise” would be included in this category (Jamieson, 1984, p. 9).</p> <p>Education for enterprise, deals more with the preparation of aspiring entrepreneurs for a career in self-employment with the specific objective of encouraging participants to set-up and run their own business. Participants are taught the practical skills required for small business set-up and management, and the courses are often geared towards the preparation of a business plan. Business startup schemes and start your own business programmes, would be examples of this type of entrepreneurship training. Jamieson (1984) sees this as the narrowest definition as it refers to educating people to startup their own small business, with an emphasis on startup and small.</p> <p>The third category, education in enterprise, deals mainly with management training for established entrepreneurs and focuses on ensuring the growth and future development of the business. Management development and growth training programmes, as well as specific product development and marketing courses, might fit into this category. In addition, such training provides skills, knowledge and attitudes for people to go out and create their own futures and solve their own problems (Jamieson, 1984, p. 19). Although this definition refers strongly to the world of business, it is by no means restricted to it. Hence, education in enterprise can refer to courses aimed at helping individuals or groups to adopt an enterprising approach, irrespective of the type of organisation for which they work.</p> <p>Garavan and O’Cinneide (1994) adopt a broader view to categorizing entrepreneurship education and training, differentiating between, on the one hand, entrepreneurship education, and on the other, education and training for small business owners.</p> <p>Cox (1996) believes that a primary objective of training interventions targeted at the awareness stage of entrepreneurial development is the promotion of self-efficacy with regard to new venture creation. Instruction at this stage, therefore, should seek to provide mastery experiences or opportunities to act entrepreneurially, as well as exposure to several real-life entrepreneurs.</p> <p>Timmons et al. (1987) suggest that that there is a limit to what can be taught in entrepreneurship training programmes, and that the only way to learn is through one’s own personal experience. With this in mind, they see the quality of the resulting business plan as a key measure of effective experiential learning. However, Gibb (1997) questions the emphasis placed by many entrepreneurship programmes on producing a business plan, despite the fact that business plan development would appear to be a common element in most entrepreneurship programmes (Hills, 1988). He suggests that excessive focus on the business plan as an output may inhibit entrepreneurial response to subsequent changes in the</p>
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	<p>environment. Gibb (1997) recommends that trainers realising a business plan is the only way of exploring a new venture, and that it is often of more use to the bank manager or grant-aiding body than to the entrepreneur him/herself.</p> <p>Shepherd and Douglas (1996) criticise the use of the less traditional case study, role play, simulation and problem solving teaching methods, arguing that, in the confines of the classroom where guidelines are provided and outcomes are known, such mechanisms are actually promoting logical rather than creative or entrepreneurial thinking.</p> <p>McMullan and Boberg (1991) compared the case method of teaching with the project method, the latter were felt to be more effective in teaching entrepreneurship</p> <p>Gibb (1987b) the learning emphasis in many educational establishments and business schools is very much on the past, with a focus on the understanding, feedback and analysis of large amounts of information. In reality, the entrepreneur is focused on the present, with little time for critical analysis.</p> <p>analytical thinking, accounting, finance, marketing, management information systems and manufacturing are among those aspects of entrepreneurship that can be taught. However, other more critical skills such as judgement, handling people, patience and responsibility cannot be taught directly and can only be learned in the real world (Timmons &amp; Stevenson, 1985).</p>
<i>Results</i>	<p>Despite the growth in entrepreneurship education and training programmes, the paper reports that little uniformity can be found. Attention is drawn to the art and the science of entrepreneurship, with the consensus that at least some aspects of entrepreneurship can successfully be taught. Science refers to that which is teachable, and the art refers mainly to that which is not (Saee, 1996; Shepherd and Douglas, 1996; Jack and Anderson, 1998).</p>

<b>Mwasilviba, 2010</b>	
<i>What/When/How</i>	<p>A semi-systematic literature review with an attempt to reduce the author's bias. A total of 108 articles are reviewed in stages and by categorizing in terms of educational objectives, target audiences, community outreach activities, applied teaching methods and impact indicators.</p>
<i>Why</i>	<p>This paper aims to take stock of existing publications devoted to entrepreneurship education and assess the alignment existing between its generic objectives, target audience, teaching methods and impact indicators.</p> <p>(1) What are the perceived meaning, definition and objectives of entrepreneurship education? (2) What are the types, contents and target audiences of entrepreneurship education? (3) What are the most advocated teaching methods? What are the applied teaching methods? (4) What role does entrepreneurship education play to local entrepreneurs, local communities and society at large? What are the strategies used to achieve this? (5) How do trainers and researchers assess the impact? What indicators do they use?</p> <p>1), the specific objectives (i.e. to train individuals for, about or in entrepreneurship) and, 2) to support local communities, 3) its forms, type of courses, target groups and outreach projects, 4) the applied teaching methods and community outreach activities, and; finally 5) the success indicators and methods for evaluation and impact measurement.</p>
<i>Focus</i>	<p>Scholars in this field of study, though differing in a number of definitive issues, are converging towards a single framework of entrepreneurship education. There is a shift from a start-up view to an attitude-changing perspective of entrepreneurship education. However, with a diversity of target groups, there is still a non-alignment between what educators and other stakeholders wish to achieve in educating for entrepreneurship with the applied pedagogical approaches, and success indicators.</p>

	<p>It is in a definition where one may be able to discover the essence, concerns and objectives of entrepreneurship as a field of study (Hytti and O’Gorman, 2004; Jones and English, 2004; Henry et al., 2005a, b; Gartner, 1990). These basic issues, emanating from a definition, are later taken to be the basis for conceptually aligning entrepreneurship education with the appropriate target audience, course contents and teaching methodologies.</p> <p>There is a common belief that entrepreneurship education would help to influence culture and build enterprising economies (McKeown et al., 2006; Matley, 2005a, b; Kirby, 2004; McMullan and Long, 1987).</p> <p>There is still a strong disagreement in some of the crucial definitional issues, especially on the most pivotal terms like entrepreneurship itself, enterprise, and who is an entrepreneur (Cunningham and Lischeron, 1991; Gartner, 1990; Hebert and Link, 1989). Also, there is a confusing application of terms like “entrepreneurship education” and “enterprise education” (Pittway and Cope, 2007; Garavan and O’Cinneide, 1994a, b; Gartner, 1990).</p> <p>It is important to point out that different interpretations of entrepreneurship, enterprise, and an entrepreneur have far-reaching effects on the understanding of the objectives of entrepreneurship as field of study, the setting of specific course objectives, the choice of target audiences, the design of course content, the teaching methods applied, and ultimately on evaluating progress and on the design of impact assessment frameworks.</p> <p>A major challenge in comparing or combining studies in entrepreneurship (education) originates more from authors’ differences in defining some of the pivotal issues, than on their contextual embeddedness; an observation that was also made in Coviello and Jones (2004). From this knowledge, it is argued that while entrepreneurship programmes may be affected by issues that are unique in a given country, the essence and goal for these programmes are universal.</p> <p>Apparently, it is a common myth that for results of such reviews to be reliable they should only consider quantitative or randomized studies (Petticrew, 2001).</p> <p>It is possible to group entrepreneurship programs in terms of their focus, level of education, and target audience (see Honig, 2004; Kirby, 2004; Finkle and Deeds, 2001; Charney and Libecap, 2000; Laukkanen, 2000). For instance, Kirby (2004) reviewed about 205 entrepreneurship programmes and found that they have these three main focuses.</p> <p>Also important to non-business students and other vocational disciplines like engineering (Keogh and Galloway, 2004; Katz, 2003; Hynes, 1996).</p> <p>According to Hulme (2000), impact assessment is associated with the outcomes of an intervention rather than with input and output. The goal in impact assessment is to “prove the effects” and later improve the intervention. On the other hand, an evaluation entails a review of both students and the programme to measure either quality or progress (Solomon et al., 2002). Measuring effect (impact) means looking for causality, which is quite a separate process to that of measuring progress and quality (evaluation). For instance, evaluations are based on a set of standards as a benchmark, whereas impact assessment draws its basis from the predetermined objectives of an intervention (Hulme, 2000).</p>
<p><i>Outcome variables</i></p>	<p>Jones and English (2004) who have constantly substituted entrepreneurship education with entrepreneurial education; and defining it as “a process of providing individuals with the ability to recognize commercial opportunities and the insight, self-esteem, knowledge and skills to act on them” (Jones and English, 2004).</p> <p>entrepreneurship education is generally aimed at creating or increasing entrepreneurial attitudes, spirit and culture among individuals and in the general community (Co and Mitchell, 2006; Henry et al., 2005a, b; Galloway et al., 2005; Hytti and O’Gorman, 2004; Kirby, 2004; Bechard and Toulouse, 1998; Gibb, 1993; Hills, 1988).</p>

	<p>Graduate start-ups were the highest ranked success indicator, students' academic standards (including examination scores and GPAs) were ranked the second most immediate impact indicator (Charney and Libecap, 2000; Vesper and Gartner, 1997; Hynes, 1996). Psychological constructs, for example change in students' attitudes, perceptions, interest, self-efficacy, confidence, abilities and skills towards entrepreneurship (see Souitaris et al., 2007; Lee et al., 2006; Fayolle et al., 2006; Veciana et al., 2005; Peterman and Kennedy, 2003; Rosa, 2003). If read closely, seem to focus on ascertaining students' attitudes/intentions towards starting their own business; this gives the impression that venture creation is still the main preferred impact indicator, although addressed in a different way (the attitudinal way).</p> <p>Change on students' need of achievement and locus of control (see Hansemark, 1998).</p> <p>University students are a group of young people, of which the majority have high but unstable career aspirations that decline with age/time (Jacobs et al., 1991). The study of Galloway and Brown (2002) and many other studies indicate that most graduates usually plan to start their own businesses after five to ten years of work experience. Over a period of five to ten years a graduate's attitudes and intentions may change several times. This is justified by Audet's (2004) study, in which he measured the stability of entrepreneurial perception and intentions over a period of just 18 months and concluded that the temporal stability of these constructs is questionable.</p> <p>Linan (2008) argues that situational factors (e.g. time constraints, task difficulty and social pressures) have an influence on attitudes towards entrepreneurship. As time and other situational influences continue to act on the students even after graduation, they make most impact assessment conclusions (especially those taken immediately after the completion of the course) tentative at best.</p> <p>A set of quality or progress indicators for entrepreneurship education such indicators should be, as suggested by Hudson and Anderson (2005), relevant to policy makers, valid and able to measure the condition accurately, reliable and consistently used, easy to interpret and understand, and able provide timely information. Each indicator should be logically connected to other indicators.</p>
<p><i>Teaching methods</i></p>	<p>Educating for, about, in or through entrepreneurship (see Co and Mitchell, 2006; Kirby, 2004; Hytti and O'Gorman, 2004). Here, it is argued that objectives are narrowed in terms of what educators (or/and students) intend to achieve and hence a determinant for the choice of pedagogical approaches. Educating in entrepreneurship is said to aim at making individuals become more entrepreneurial (innovative) in their existing firms or place of work (Henry et al., 2005a, b; Kirby, 2004; Dreisler et al., 2003). Hytti and O'Gorman (2004). Kirby (2004) gives another term: educating through enterprise which, according to him (Kirby, 2004) is when educators use new venture creation to help students acquire a range of both business understanding and skills or competences. It seems that educating through entrepreneurship is more of a teaching approach in educating for entrepreneurship than an objective in itself. taking all the three objectives in consideration, Dreisler et al. (2003) could not see if there is any visible demarcation between for and about.</p> <p>Although Hynes (1996) is of the opinion that both the course focus and content ought to vary in accordance with the specific requirements and needs of students, Matley (2005a, b) observed that the current variation is so wide as to make the general appropriateness and effectiveness of entrepreneurship courses questionable.</p> <p>the most taught subjects are: (1) resources marshalling and finance (16 per cent); (2) marketing and salesmanship (14 per cent); (3) idea generation and opportunity discovery (13 per cent); (4) business planning (12 per cent); (5) managing growth (12 per cent); (6) organisation and team building (10 per cent); (7) new venture creation (9 per cent); (8) SME management (8 per cent); and (9) risk and rationality (6 per cent).</p>

	<p>There has been performed many experiments on teaching methods (see Izquierdo et al., 2007; Lourenc,o and Jones, 2006; Heinonen and Poikkijoki, 2006; Robertson and Collins, 2003; McMullan and Boberg, 1991). Many also propose what they consider to work best (see Verduyn et al., 2009; Hannon, 2006; van Auken et al., 2006). Bennett (2006), in his study involving 141 entrepreneurship lecturers, found that the lecturers had no consensus on how the course should be taught.</p> <p>the three most used methods are: (1) lectures; (2) case studies; and (3) group discussions. Other methods used, but not as common as the previous group, include: . business/computer or game simulations (Hindle, 2002); . video and filming (Verduyn et al., 2009); . role models or guest speakers (Hegarty, 2006; Fiet, 2000a, b); . business plan creation; and . project works. Also used were games and competitions, setting of real small business ventures, workshops, presentations and study visits (Keogh and Galloway, 2004).</p> <p>link with local entrepreneurs through internship opportunities for students (Co and Mitchell, 2006; De Faoite et al., 2003; Hytti, 2002; Gibb, 1993); public symposia and awareness campaigns (Edwards and Muir, 2005; Hytti, 2002; Vesper and Gartner, 1997); and students' consulting projects with local entrepreneurs (Kuratko, 2005; Edwards and Muir, 2005; Vesper and Gartner, 1997).</p> <p>If entrepreneurship is to be learned as a career, it is best done using some kind of apprenticeship (Aronsson, 2004). doing something practical and having an opportunity to question, investigate, converse, and discuss with real-world entrepreneurs gives both knowledge and skills and also stimulates attitudes. However, in a practical sense most of the advocated active/action-based teaching methods are costly and somehow may not align to the conventional university system of teaching and awarding (Birch in Aronsson, 2004). Biggs (1996) argues that learners bring in the classroom an accumulation of motives, intentions, and previous knowledge that affect the learning process and determines the course and quality of learning that may take place in order to stimulate entrepreneurial behaviours. The question thus is: is it a matter of proper choice of subjects (i.e. what to teach) or of teaching methods (i.e. how and who to teach it), or both?</p>
<i>Results</i>	<p>Although there is no consensus in the basic definitional issues, there is a common understanding of what entrepreneurship education is generally attempting to achieve. Too much educational effort has been directed to producing entrepreneurs and less has been directed towards the study of the institutional environments in which these graduates are going to operate. The World Bank (2002) argues that institutions (e.g. political, judicial, financial, society, media, etc.) influence both entrepreneurial opportunities and entrepreneurs' ability to use their skills and resources. It would be interesting to study the role of entrepreneurship education towards these institutions, or how these environmental institutions shape the curricula and approaches in entrepreneurial programmes.</p> <p>There is also a need for further research on the performance of entrepreneurship graduates in workplaces, which happen to form a bigger proportion among entrepreneurship graduates.</p>

<i>Hägg &amp; Gabrielsson, 2017</i>	
<i>What/When/How</i>	<p>334 articles published or available in press from January 1980 to July 2017 in 62 academic journals</p> <p>“who-is-doing-what-for-whom-and-how” framework</p> <p>analytical framework that centers on instructors (who), content (what), target (for whom) and teaching methods (how).</p>
<i>Why</i>	<p>To understand how the field of entrepreneurship education has developed over four decennia.</p>

<p><i>Focus</i></p>	<p>Entrepreneurship research has been highly successful in becoming an established and highly legitimate field of academic research (Aldrich, 2012; Frank &amp; Landström, 2016; Welter &amp; Lasch, 2008). This interest is driven by the recognition that entrepreneurship is a key driving force behind social and economic transformation, and as a response, educational initiatives within the field have expanded (Fayolle et al., 2016; Kirchhoff &amp; Greene, 1998; Storey, 1994; Van Praag &amp; Versloot, 2008).</p> <p>However, entrepreneurship education remains a young and fragmented field of research where scholars continue to debate what focus this form of education should have (Fayolle, 2013; Jones, 2010; Neck &amp; Greene, 2011). To some degree the reason behind this is due to the fact that some courses focus specifically on “start-up” entrepreneurship and the process of new venture creation, other courses cover various aspects related to operating and running a small growing business, while yet others focus more on developing entrepreneurial attitudes and behaviours (Mwasalwiba, 2010; Sirelkhatim &amp; Gangi, 2015). The educational initiatives will look different since these varying conceptions relate to the issue of pedagogy, which implicitly determines teacher practices, learner roles, and expected learning outcomes (Fayolle et al., 2016). Research on entrepreneurship education has a largely fragmented knowledge base (Byrne, Fayolle &amp; Toutain, 2014; Fayolle, 2013; Pittaway &amp; Cope, 2007a), which provide challenges with respect to understanding its development and direction.</p> <p>Most studies remain descriptive without any explanation of the underlying learning process theories that are at play (Mwasalwiba, 2010; Naia et al., 2015; Sirelkhatim &amp; Gangi, 2015). As the literature is short on universal definitions of what ‘entrepreneurship’ means when implemented in educational settings (Gibb, 1987; Mwasalwiba, 2010; Pittaway &amp; Cope, 2007a), there have been calls to develop the legitimacy of the field by advancing its theoretical and methodological foundations (Fayolle et al, 2016).</p> <p>Nevertheless, entrepreneurship education represent one of the most progressive and innovative forms of teaching (Greene et al., 2004), where students have been confronted with action-oriented pedagogies that engage them in writing business plans, developing products, services and business models, and starting up real-live ventures (Duval-Couetil, 2013; Rasmussen &amp; Sørheim, 2006).</p> <p>The number of published articles on entrepreneurship education, including review articles, has grown exponentially since the 1980s. We can also see that the share of review articles have remained quite stable and the balance between conceptual and empirical contributions is fairly stable over time, except during the last period (2010-)when empirical studies have increased in scope. The number of articles that are theoretically grounded is also increasing over time, which may reflect a growing sophistication</p> <p><b>1980s</b></p> <p>In the 1980s there is no particular orientation or structure that dominates the debate (Vesper, 1982). Teaching content is primarily delivering knowledge about entrepreneurship (Jamieson, 1984), and is much influenced by contemporary management theories adapted to new and small business settings (McMullan &amp; Long, 1987). There is a large degree of homogeneity in courses (Hills, 1988; Zeithaml &amp; Rice, 1987), where universities typically offer one general course aimed towards new business development, sequenced by a follow-up course where students engage in a consulting experience (Zeithaml &amp; Rice, 1987). There is no active search for students and virtually no outreach activities. Instead, there is an implicit belief that</p>
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students interested in entrepreneurship will find their way to programs and courses a process of self selection (Brown, 1990) or “self placing” (Zeithaml & Rice, 1987).

Curriculum development was a topic of interest for the lion share of all research on entrepreneurship education, but also that the share of articles addressing this topic has decreased over time. Addressing student learning was on the other hand low, but the topic increased considerably in the 1990s and has remained relatively strong since then. Instructors were more concerned with teaching entrepreneurship based on their disciplinary backgrounds, rather than focusing on issues considered important in entrepreneurship research (Curran & Stanworth, 1989; Sexton & Bowman, 1984).

1990

In the 1990s: Teaching content is much influenced by the practical aspects of starting, managing and developing a new or small business, which typically are overlooked or less emphasized in other business courses (Gartner & Vesper, 1994).

Two distinct target markets for entrepreneurship education emerge in the beginning of the 1990s. The first consist of students considering entrepreneurship as a subject in their business degree program, and the other consist of students who reside outside traditional educational settings but seek lifelong learning (Solomon & Fernald, 1991). In line with this, there is also an increasing emphasis on finding prospective students with the aim to make them aware of the opportunity to develop their entrepreneurial capabilities and attitudes (Gibb, 1993; Jack & Anderson, 1999; Solomon et al., 1994). Overall, there is during this period a massive growth in the supply of entrepreneurship education (Katz, 2003), fueled by the perception that entrepreneurship is an important driver of economic advancement and change in society (Jack & Anderson, 1999).

2000

The spiritual dimension (e.g. Fayolle & Gailly, 2008) is much more explicit in the pedagogical debate on teaching content in the 2000s, with a focus on helping entrepreneurs to position themselves in time and space as regards to entrepreneurial situations, such as know-why and know-when (Johannisson, 1991). An intensified stream of research suggests that entrepreneurship should be connected to learning by doing (Cope & Watts, 2000; Politis, 2005), thereby emphasizing the importance of lived experience (Rae & Carswell, 2001). Teaching content is much influenced by approaches such as effectuation (Sarasvathy, 2001) and learning from failure (Politis & Gabrielsson, 2009). Specialization in offers continues and the target market is split in different categories with specific aims, such as action-based entrepreneurship (Rasmussen & Sørheim, 2006), social entrepreneurship (Tracey & Phillips, 2007), and the broader notion of enterprise education (Jones, 2009; Peterman & Kennedy, 2003).

Instructors with a background in entrepreneurship begin to dominate. There is an increasing use of research findings in teaching, and advancements are continually adopted to support classroom teaching (Fiet, 2001a). There is also a widespread use of practicing entrepreneurs in the classroom delivering guest lectures based on their own personal experiences as a way to bridge theory and practice (Kuratko, 2005; Solomon, 2007).

2010

	<p>The theoretical dimension (e.g. Fayolle &amp; Gailly, 2008) becomes much more apparent in the debate in the 2010s, with a focus on theories and scientific knowledge useful to understand entrepreneurship. Entrepreneurship education is at the same time becoming much more diverse. Two distinct paths seem to emerge in the debate. One path is more specialized and targets specific segments of students. This ‘entrepreneurship’ path is dominated by new venture creation-oriented training where students are prepared for an entrepreneurial career (Lackéus &amp; Williams Middleton, 2015; Åsvoll &amp; Jacobsen, 2012), but it also includes social and societal entrepreneurship (Bullough et al., 2015; Howorth et al., 2012; Zhu et al., 2016) and corporate entrepreneurship education (Kuratko, 2005; Morris et al., 2011; Pittaway &amp; Edwards, 2012). The Broader ‘entrepreneurship’ path that is targeting the entire population of students, and which aims to develop their entrepreneurial knowledge, skills, and attitudes regardless of their future occupation (Hjorth, 2011; Jones, 2010).</p> <p>There is a growing acknowledgement of conceiving instructors as facilitators rather than teachers’ due to a gradual shift towards a more learnercentered approach in pedagogical debates on entrepreneurship education (Hynes et al., 2010; Mueller &amp; Anderson, 2014; Robinson et al., 2016).</p> <p>There is however little consensus of what roles instructors has in entrepreneurship education (Fayolle &amp; Gailly, 2008). Along these lines, there is added emphasis on the need to combine both research active faculty and practitioners when teaching entrepreneurship.</p>
<i>Outcome variables</i>	<p>The primarily pedagogical challenge that mark contemporary discussions are related to issues of making proper assessments and measuring impact (Rauch &amp; Hulsink, 2015), both with respect to what entrepreneurship education should accomplish in terms of student learning, as well as what various stakeholders (including students) expect in terms of behavioral outcomes (e.g. Duval-Couetil, 2013; Fayolle &amp; Gailly, 2015).</p> <p>The need to make comparison of pedagogies and best practices across institutional contexts (e.g. Pittaway &amp; Edwards, 2012; Scott et al., 2016). Assessment practices have not developed in the same pace as new teaching methods have been implemented (Pittaway et al., 2009). Existing approaches are in this respect highly context dependent, and there is a lack of theoretically grounded and methodological sound evaluation and assessment frameworks that can substantiate the impact of entrepreneurship education across different contexts and programs (Pittaway &amp; Edwards, 2012; Liñán &amp; Fayolle, 2015; Rauch &amp; Hulsink, 2015).</p>
<i>Teaching methods</i>	<p>1980s A traditional didactic approach to teaching (e.g. Thorndike, 1921) where the instructor design and control the learning situation. Popular teaching methods include lectures, guest lectures, cases and assigned readings (Hills, 1988; Vesper, 1982). However, there seems to be a widespread recognition that traditional teaching methods are ill fitted to entrepreneurship education (Sexton &amp; Bowman, 1984; Weinrauch, 1984). Instead, there is an emphasis on “taking action” by including experiential exercises and working with or alongside actual entrepreneurs (Ronstadt, 1985; Sexton &amp; Bowman-Upton, 1987, 1988). The use of business plans is emerging as a distinct teaching method, which will become imprinted as a core feature in entrepreneurship education (Hills, 1988; Honig, 2004).</p> <p>1990s Business plan writing, lectures, guest lectures, cases and assigned readings are commonly used as teaching methods (Gartner &amp; Vesper, 1994). Scholars are in this period moving towards a more unified view on the need to have a practice oriented focus to reflect “real-</p>

	<p>world environments” (Solomon et al., 1994). Rise in the use of simulations as a way to teach (Gundry &amp; Kickul, 1996; Katz, 1999).</p> <p>2000s Entrepreneurship education is becoming increasingly embedded in experience-based learning (Dhliwayo, 2008; Honig, 2004; Pittaway &amp; Cope, 2007b; Sherman et al., 2008) and process driven pedagogies (Jones, 2006; Löbler, 2006). Teaching methods vary but typically include general lectures, presentations and handouts, and video and case study based learning (Henry, Hill &amp; Leitch, 2005). There is also emphasis put on finding a mix of experience and theoretical learning (Fiet, 2001a, 2001b; Henry et al., 2005).</p> <p>2010s Emphasis on effectuation logic (Neck &amp; Greene, 2011; Sarasvathy &amp; Venkataraman, 2011). More rational and practice based ideas and approaches are also transformed into teaching methods, such as design-based thinking (Penaluna et al., 2012; Rauch &amp; Hulsink, 2015), lean start-up (Daniel, 2016; Harms, 2015), and the business model canvas (Osterwalder &amp; Pigneur, 2010).</p> <p>Overall, the focus has moved beyond definite discussions of what to teach in the classroom, and more towards how teaching content may stimulate learning among students.</p>
<i>Results</i>	<p>The field has also moved beyond traditional start-up conceptions of entrepreneurship (Jones et al., 2014; Lackéus et al., 2016) and is often discussed in a systemic perspective where the interplay between the individual and broader society is highlighted (e.g. Bullough et al., 2015; Lourenço et al., 2015).</p> <p>Action oriented and practice based approaches have raced far ahead of theory and calls for a critical stance towards their pedagogical and theoretical roots (Fayolle, 2013; Rideout &amp; Gray, 2013). The role of action, experience and reflection for learning are in this respect more intensely discussed (Gielnik et al., 2015; Higgins &amp; Elliott, 2011; Hägg &amp; Kurczewska, 2016; Kassean et al., 2015). Overall, there has been a shift from how to teach entrepreneurship towards how students can learn valuable lessons for life through entrepreneurship education.</p> <p>There is no theoretical framework that can provide proper guidance with respect to appropriate contents and teaching methods for different kinds of entrepreneurship education (Mwasalwiba, 2010; Naia et al., 2014, 2015; Sirelkhatim &amp; Gangi, 2015), which means that instructors to a large extent have to understand and decide themselves which pedagogical approaches that may best suit their teaching contexts. As such, there seems to be a need to advance the theoretical foundations of entrepreneurship education (Fayolle et al., 2016).</p> <p>There are very few “bridging” scholars that make contributions in both fields of research. As a result, there is today limited crossfertilization between the research communities in terms of knowledge transfer and theoretical integration, especially with regards to the lessons learned from entrepreneurship research and its implications for entrepreneurship teaching (e.g., Bécharde &amp; Gregoire, 2005).</p> <p>Future research There are few theoretical insights about the role of the instructor in the context of entrepreneurship education (Seikkula-Leino et al., 2010), for example the perceptions and teaching philosophies of instructors, the extent to which research active academics vis-a-vis</p>

	<p>practicing professionals facilitate different kinds of learning outcomes, and whether differences in levels and forms of education, categories of learning outcomes, and the specific focus on the course or program also calls for different instructor competencies and skills to effectively guide students in the learning process (e.g., Fayolle &amp; Gailly, 2008; Rennemo, 2015).</p> <p>There are few comparative studies of entrepreneurship education (e.g. Lima et al., 2015; Walter &amp; Block, 2016), and there is also a general shortage of studies that follows entrepreneurship education over time longitudinally and through pre- and post-tests (e.g. Gielnik et al., 2015; Lyons et al., 2015).</p> <p>The effectiveness and impact of various forms and methods of teaching has for a long time been largely unquestioned in research on entrepreneurship education, but this is now increasingly emphasized as a key area of inquiry (Duval-Couetil, 2013; Lyons et al., 2015).</p> <p>There are a number of studies that have applied ethical, social and sustainable perspectives in entrepreneurship education (Wyness et al., 2015). In this respect, scholarly attention is needed to understand how entrepreneurship education can be used to meet new and changing demands that societies are facing (Liñán &amp; Fayolle, 2015; Westhead &amp; Solesvik, 2015).</p>
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<i>Shepherd et al., (forthcoming)</i>	
<i>What/When/How</i>	<p>In this literature review the focus is on dependent variables (DVs) used in entrepreneurship research. The scope is thus very broad and only briefly touch upon entrepreneurship education. The DVs are divided into four categories, three stage-based process categories and one context-oriented category: (a) initiation, (b) engagement, and (c) performance of entrepreneurial endeavours embedded in (d) environmental conditions, in which an entrepreneurial endeavour is the investment of resources into the pursuit of a potential opportunity.</p> <p>918 articles published in 2001-2017 in 9 top-ranked journals in entrepreneurship and management research have been reviewed</p>
<i>Why</i>	<p>A bottom-up approach is applied where topics that are deemed as being important outcomes of entrepreneurial activities by researchers within the field is identified. The goal is to understand what researchers within the field consider to be of interest.</p>
<i>Focus</i>	<p>This reviews broad focus makes it necessary to limit what to include in our review. Some of the categories, such as initiation and engagement, is of more interest since much educational initiatives' target groups are in this stage. These stages will thus receive more focus, whereas the other two (entrepreneurial endeavours and context) will only be included briefly.</p> <p>Initiation stage:          Psychological DVs have received a large interest. They have in the review been divided into six categories: 1) entrepreneurial cognitions about opportunity, 2) entrepreneurial cognition on other initiations, 3) entrepreneurial intention, 4) entrepreneurial motivation, 5) entry, and 6) distinctive groups of initiating endeavours. DVs for the engagement of entrepreneurial endeavours—the cognitive, affective, behavioural, and/or organizational activities of involvement in the process of exploiting a potential opportunity—include outcomes related to (1) engaged decision making, (2) acquiring and allocating resources, (3) entrepreneurial organizing, (4) commitment, affect, and well-being; (5) engaged learning; and (6) innovative orientation, inputs, and outcomes.</p>

Many articles discuss how entrepreneurs apply search strategies when identifying and creating opportunities (De Carolis & Saporito, 2006; Wood et al., 2017). Topics such as: how and where to search (Dimov, 2007; Fiet, 2007), when to stop searching (Fiet et al., 2005), and ideas generated or identified through search (Fiet & Patel, 2008). Entrepreneurial intentions have also received a lot of focus (Dohse & Walter, 2012; Erikson, 2002; Lee & Venkataraman, 2006; Bullough et al., 2014) even if the its link to actual entrepreneurial behaviour has been highly criticised (Van Gelderen et al., 2015).

Many articles also discuss the motivation of entrepreneurs, which for example can be: wealth creation (Amit et al., 2001; McCaffrey, 2014), social, or environmental value (Hechavarría et al., 2017; Patzelt & Shepherd, 2011) or to make a change in the world by creating something new (Wyrwich, 2015). Closely aligned to motivation is aspirations which also received a lot of interest, such as: entrepreneurs' development aspirations (Doern & Goss, 2014), aspirations for growth (Wiklund & Shepherd, 2003), and inclination to persevere with current exploration activities (Muehlfeld et al., 2015). Also, research has investigated entrepreneurs' aspirations to pursue political appointments (Li & Liang, 2015), and the entrepreneurial aspirations of ethnic minorities (Thomas, 2009).

Entrepreneurial commitment— a personal investment of time, energy, and other resources into the exploitation of a potential opportunity, which can generate affective outcomes and have implications for the entrepreneur's well-being – has also been studied extensively (Davidsson & Gordon, 2016; Renko et al., 2012; DeTienne et al., 2008; McMullen & Kier, 2016), with topics such as: affective commitment (Pollack et al., 2015) by employees (Breugst et al., 2012), new transaction commitment mindset (Mitchell et al., 2008) and grit and perseverance for long-term goals (Wolfe & Patel, 2016), or terminate the failing projects of a corporate portfolio (Behrens & Patzelt, 2016; DeTienne et al., 2015; Shepherd et al., 2014) or a failing business (Shepherd et al., 2009).

Many articles discuss emotional and social outcomes, such as: trust (Howorth & Moro, 2006; Nguyen & Rose, 2009; Goel & Karri, 2006), perceptions of relational support (De Clercq & Rangarajan, 2008). Much focus where paid to negative emotions (Breugst & Shepherd, 2017; Collewaert & Fassin, 2013; Doern & Goss, 2014); envy (Biniari, 2012), feelings of grief over failure (Jenkins et al., 2014; Shepherd, 2003; Shepherd et al, 2011), stigma of a failed business (Shepherd & Patzelt, 2015), fear of failure (Cacciotti et al., 2016; Mitchell & Shepherd, 2010). Also positive emotions were given a lot of focus with DVs such as: passion (Cardon et al., 2017; Collewaert et al., 2016); global life satisfaction (Baron et al., 2016), job satisfaction (Kwon & Sohn, 2017; Schjoedt, 2009), pay satisfaction (Dawson, 2017), and quality of life (Kautonen et al., 2017), and, peak experience, peak performance, and flow (Schindehutte et al., 2006). Habitual entrepreneurship has also been studied as an addiction which involves both positive and negative emotions (Spivack et al., 2014).

A typical firm level DV that has received a lot of interest is *entrepreneurial orientation (EO)* (Boling et al., 2016; Grünh et al., 2017). A DV related to EO that lately has received high level of attention is *pivoting* (Grimes, 2018; Dewald & Bowen, 2010; Cumming & Dai, 2013; Eggers & Song, 2015; Wasserman, 2003).

Decision making and entrepreneurial judgment is also DVs which have received extensive focus with topics such as: the speed of decision making (Bakker & Shepherd, 2017; Forbes, 2005), and decisions about the future in terms of growth (Delmar & Wiklund, 2008; Wiklund et al., 2003) and expectancies (Manolova et al., 2007), the accuracy of decisions (Cassar & Craig, 2009), investment choices (Cassar & Friedman, 2009), susceptibility to status quo bias (Burmeister & Schade, 2007), hindsight bias (Cassar & Craig, 2009), overoptimism (Cassar, 2010; Hmieleski & Baron, 2009; Ucbasaran et al., 2010) and over-confidence (Busenitz & Barney, 1997; Hayward et al., 2006). But also more specialised such as: ethical decision

making in terms of moral imagination and identity (McVea, 2009), rule breaking (Brenkert, 2009), moral disengagement (Shepherd et al., 2013), and informal entrepreneurship (Webb et al., 2013).

DVs focused on performing entrepreneurial endeavours have extensive focus on performance (Bruneel et al., 2010; Prashantham & Dhanaraj, 2010; Huang & Pearce, 2015; Dimov & Shepherd, 2005; Florin, 2005; Lockett, Wright & Franklin, 2003). They can be divided into six categories: (1) individual-level accomplishments, (2) general firm-level accomplishments, (3) firm-level accomplishments specific to entry; (5) firm-level accomplishments specific to innovation; and (6) regional performance. There are examples of performance DVs such as: success in setting up a new venture (Katre & Salipante, 2012; Blumberg & Pfann, 2016), accurate identification and evaluation (Baron & Henry, 2010) and realization of a (potential) opportunity (Navis & Ozbek, 2016), growth in employees (Davis & Shaver, 2012), sales (Delmar & Wiklund, 2008), or assets (Thapa, 2015), market value (Zott & Amit, 2007), earnings (Michael, 2003), profits (Jacobides & Winter, 2007), profit margin (Song, Wang & Parry, 2010), and various accounting ratios (Meoli et al., 2013; Wennberg et al., 2011).

The large categories are *performance specific to entry* (Bird & Wennberg, 2016; Nziramasanga & Lee, 2001; Van Gelderen, Van de Sluis & Jansen, 2005; Vivarelli, 2004, Marvel et al., 2018; Beckman, 2006; Edelman & Yli-Renko, 2010; Davidsson & Honig, 2003); *performance specific to innovation* (Lejarraga & Martinez-Ros, 2014; McKelvie et al., 2017; Wu et al., 2016; Collewaert & Sapienza, 2016; Robson et al., 2012; Tan, et al., 2015; Baron & Tang, 2011; Liu et al., 2010; Park & Tzabbar, 2016); and *regional performance* (Malchow-Møller et al., 2011; Tamvada, 2010; Liang & Goetz, 2016; Samila & Sorenson, 2017; Gries & Naudé, 2010; Minniti & Lévesque, 2010; Hunt & Fund, 2016; Casson & Wadeson, 2007; Norbäck et al., 2016; Tobias et al., 2013; Nissan et al., 2012; Van Stel et al., 2005; Anokhin & Schulze, 2009; Naudé et al., 2014).

There are also plentiful DVs focusing on context (Masuda, 2006; Shinnar et al., 2012; Acs et al., 2009; Levie & Autio, 2011; Aidis et al., 2012; McMullen et al., 2008; Henrekson & Sanandaji, 2014; Hafer & Jones, 2015). The articles can be divided into three categories: (1) institutional context, (2) resource context, and (3) regional context. Of interest to our analysis can be articles focusing on how entrepreneurial activity creates new groups of organizations (Chung, 2001; Lechner & Leyronas, 2009), new networks of inter-organizational activity (Ahlstrom & Bruton, 2006; Dieleman & Sachs, 2008), and new organizational forms (David et al., 2013; Suddaby & Greenwood, 2005), ability to generate novel product categories (Delmestri, Montanari & Usai, 2005; Montauti & Wezel, 2016); changing institutionalized business practices (Quattrone, 2015), and resistance to illegitimate institutions (Sutter et al., 2013).

Of interest can also be articles studying resource context in terms informal venture capital (e.g. business angels) (Maxwell & Lévesque, 2014; Becker-Blease & Sohl, 2007, 2011; Klyver et al., 2017; Carpentier & Suret, 2015; Huang & Pearce, 2015; Parhankangas & Ehrlich, 2014; Kuppuswamy & Bayus, 2017; Parhankangas & Renko, 2017; Roma et al., 2017).

There are also some categories that goes across the different stages, for example, the differences depending on gender with topics such as: initiation of entrepreneurial endeavors in terms of ownership rates (Bullough et al., 2017), latent and nascent entrepreneurship rates (Bönte & Piegeler, 2013), credit success (Kim, 2006; Brana, 2013), conversion of intentions to action (van der Zwan et al., 2012), motivation (DeMartino & Barbato, 2003), opportunity identification (DeTienne & Chandler, 2007), opportunity evaluation (Gupta et al., 2014), personality and other demographics (Cowling & Taylor, 2001; Jennings & McDougald, 2007), propensity for (Adachi & Hisada, 2017) and reasons for becoming self-employed (Saridakis et

	<p>al., 2014), and self-employment duration (Rosti &amp; Chelli, 2005), investment decisions by business angels (Carter, et al., 2007) and other forms of funding (Orser et al., 2006). Corporate venturing (or conducting entrepreneurial activities in an established organization) (Fini et al., 2012; Fitzsimmons &amp; Douglas, 2011; Marvel &amp; Lumpkin, 2007) and informal business venturing (Khavul et al., 2009), and on productive versus unproductive entrepreneurship at the macro level (Collins et al., 2016), ethics (Bucar, Glas &amp; Hisrich, 2003), social entrepreneurship (Estrin et al., 2016; Townsend &amp; Hart, 2008; Muñoz &amp; Dimov, 2015; McMullen &amp; Warnick, 2016; Meyskens et al., 2010; Dean &amp; McMullen, 2007), environmental ventures (York et al., 2016) and public-service ventures (Cabral et al., 2013). Research on business angels' decisions and entrepreneurial bootstrapping (Bammens &amp; Collewaert, 2014; Grichnik et al., 2004; Maxwell et al., 2011; Becker-Blease &amp; Sohl, 2015;; Murnieks et al., 2016; Matusik et al., 2008; Chan &amp; Park, 2015; Hsu, 2010; Bruns et al., 2008; Rassenfosse &amp; Fischer, 2016).</p> <p>One major cross-category is legitimacy, with articles about topics such as: narrative strategies to acquire legitimacy (Garud et al., 2014), professionalization (Croidieu &amp; Kim, 2017), acquisition of status (Waldron et al., 2015), identity (Fisher et al., 2016), use of persuasive rhetoric (Plummer et al., 2016; Zott &amp; Huy, 2007; Waldron et al., 2016), and legitimating framing (Gurses &amp; Ozcan, 2015). different types of meta-narratives used for legitimacy development (Ruebottom, 2013), the presentation of appropriate scenes to stakeholders and the range of visual symbols entrepreneurs use during interactions with stakeholders (Clarke, 2011), and the way entrepreneurs set stakeholder expectations (Garud et al., 2014), and the portioning and distributing of acquired resources (Karlsson &amp; Honing, 2009; Fisher et al., 2017; Dunkelberg et al., 2013). Related to this theme is research about networks (Vissa, 2011, 2012; Greve &amp; Salaff, 2003; Grossman et al., 2012; Hallen, 2008; Hallen &amp; Eisenhardt, 2012; Zhang et al., 2008).</p>
<i>Outcome variables</i>	<p>Multiple competences have been identified as being important to entrepreneurs and entrepreneurial activities, such as: alertness to opportunity (Ardichvili et al., 2003; DeTienne &amp; Chandler, 2007; Ozgen &amp; Baron, 2007; Valliere, 2013), and its formation (McMullen &amp; Shepherd, 2006; Shepherd et al., 2007), willingness to accept risk (Mullins &amp; Forlani, 2005), and/or uncertainty (Kuechle et al., 2016; McKelvie et al., 2011; Wood et al., 2014), tolerance for high stress (Baron, 2008); how and where to search (Dimov, 2007; Fiet, 2007; Fiet &amp; Patel, 2008; Fiet et al., 2005), ability to sustain confidence and flexibility to adapt (Miller &amp; Sardais, 2015), skilful use of persuasive language (Plummer et al., 2016).</p> <p>General DVs such as entrepreneurial self-belief—an individual's confidence in his or her ability to successfully identify, evaluate, and exploit a potential opportunity that is consistent with perceptions of "who am I" and "who I want to be entrepreneurial self-image (Forbes, 2005; Verheul et al., 2005), and the use of effectual logic vis-à-vis causal logic (Engel et al., 2017; Sarasvathy, 2001), the use of intuition (Dane &amp; Pratt, 2007), metacognition (Haynie et al., 2010), and entrepreneurial decision making as both judgment selectiveness (i.e., discernment between factors) and conviction (i.e., the strength of the causal map) (Uygur &amp; Kim, 2016), sensemaking (Strike &amp; Rerup, 2016; Mantere et al., 2013; Grimes, 2010; Cornelissen &amp; Clarke, 2010; Tocher et al., 2015), emotion regulation, was also identified.</p>
<i>Teaching methods</i>	<p>There is very limited focus on education in this review, and therefore very few articles that discuss teaching methods. However, there are some elements discussed that may be of interest, such as: failure as a context for learning (Cope, 2011; Shepherd, 2003), the use of structural alignment processes (Mueller &amp; Shepherd, 2016), emotion regulation, and narrative accounts of failure by entrepreneurs and stakeholders (Byrne &amp; Shepherd, 2015; Mantere et al., 2013).</p>

	<p>Some social learning by entrepreneurs is also discussed: entrepreneurs can learn from peers (Falck et al., 2012), from co-workers (Nanda &amp; Sørensen, 2010), within a venture's management team (Bruneel et al., 2010), and across ventures (Zheng et al., 2013), through knowledge acquisition and improvisation in teams (Zheng &amp; Mai, 2013), from competitors (Lévesque et al., 2009), and through innovation and knowledge integration (Zahra et al., 2000).</p> <p>The authors also note that: A more in-depth understanding of the opportunity emergence increases the chance for us (as educators) to teach entrepreneurs how to engage in this process more successfully, proceed through the process more quickly, and engage others in facilitating the process (how and when).</p>
<i>Results</i>	<p>The authors point-out multiple avenues for future research based on their four themes: (1) a richer and deeper investigation of opportunity, (2) a more micro-perspective of self-employment entry, and (3) an expanded range of initiation contexts, (4) human resource management and other decisions, (5) the creation of, and pivoting from, routines, (6) collective entrepreneurial cognition, (7) positive and negative affect, (8) motivation, (9) funding through family, fools and friends, and (10) entrepreneurial learning, (11) the role of the institutional context, (12) the process of building and losing legitimacy, (13) tapping into the crowd, (14) narrower regions, and (15) the role of an entrepreneur's family or non-work context.</p> <p>Exploitation of opportunities can be considered on a continuum or as multiple steps, but how does this exploitation emerge? How do collectives evaluate opportunities, and why do some entrepreneurial teams generate different assessments than others? Similarly, how do groups formulate beliefs? Do portfolio entrepreneurs think about constructing a portfolio based on ventures with varying (or similar) levels of entrepreneurialness? Sensemaking can also be an interesting avenue for studying the opportunity exploitation process (Fredrickson, 1998). This is connected to focus on different mindsets, such as entry and exit mindsets and whether these are conflicting or complementary (McGrath, 1999). With a process-oriented approach it would also be possible to explore the decision making of the multiple parties involved in an outcome, the sequence of those decisions, and the dynamism of the process, both professionally, but also personally and investigate how entrepreneurs' goals related to their businesses mesh with goals in their private lives and how both change over time.</p> <p>In relation to our focus it is interesting to see that the authors point out entrepreneurial learning as an important area for future research. Why do some entrepreneurs learn more from their experience than others, and how they do it? While we are gaining a deeper understanding of the actions and cognitions that lead to learning and vice versa, more can be done to identify and explain the learning tools entrepreneurs use, the contexts that facilitate or obstruct the use of these learning tools, and the processes of collective learning, all of which are in an environment characterized by high uncertainty, high dynamism, and considerable time pressure. What concepts and relationships constitute entrepreneurs' (individually and as a team) cognitive maps, how do these cognitive maps change with the pursuit of potential opportunities, and how does this learning manifest itself in subsequent entrepreneurial action? Explore mutual social learning, particularly around the co-creation of a potential opportunity (see Shepherd, 2015) explore the social learning that occurs between an entrepreneur and a community of inquiry as well as the way that social learning occurs through a potential opportunity and leads to changes to the nature of the potential opportunity, the nature of the entrepreneur's knowledge, and the collective knowledge of the community of inquiry. The entrepreneur is likely to learn from the funding team, and both are likely to learn from the organization they build.</p>

There are also ample avenues to further study entrepreneurial employees and their importance to start-ups. The authors were unable to identify articles related to stakeholder related performance which were examining employees' performance as an outcome. Particularly in growing and knowledge-intensive firms, it appears that employees are extremely important stakeholders and their performance is a critical proximal outcome. When it comes to studying the context there are also multiple avenues of interest, such as: the paradox of embeddedness (Battilana, Leca & Boxenbaum, 2009): if institutions are so cognitively overpowering, how is it that some actors can identify opportunities for change? The way legitimation processes change as an entrepreneurial venture matures (Suddaby, Bitektine & Haack, 2017). An important shift in understanding legitimacy first as a property or capacity of an entrepreneurial venture to an emerging new characterization of legitimacy as a process. This can be studied by using deliberation mapping—a technique used to systematically evaluate the interactive processes by which dyads or small groups come to decisions on complex and ambiguous subjects (Burgess et al., 2007).

The authors also underline that the interest for the “dark side” of entrepreneurship has increased. Entrepreneurship can spur both positive and negative emotions, and it is important to increase our understanding about how entrepreneurs are coping with failure, but also to get more insights into unproductive entrepreneurship as well as informal entrepreneurship. The authors conclude that performance is a popular category of DVs, but its dominance appears to be waning. It is interesting to note that people initiate, engage in, perform, and leave, entrepreneurship for a whole host of different reasons (e.g., Carter et al., 2004; DeTienne et al., 2015). However, while psychology-based studies have been contributing to our knowledge of entrepreneurship for some time (and increasingly so), it appears that the sociological perspective has entered and is gaining momentum as reflected in the growth of DVs related to institutions and legitimacy.

## Assessment tools

Tool	Description	Impact assessment
<b>Work-Integrated Assessment Model: COLLABORATE Project</b>	An assessment where the tasks and conditions are aligned to what you would experience within employment. Improvement suggested on six dimensions: Time, Audience, Problem/Data, Collaboration, Structure, Review	No
<b>Skills Evaluation Tool (SET)</b>	Assess the development of a student’s level on both technical and transversal competences. Educators can monitor the student’s development during the given challenge. Students will evaluate, reflect and set goals.	No
<b>Valorise-Toi (Empower Yourself)</b>	The respondent assesses him- or herself in five areas: Organizational skills, Responsibility & Initiative, Relationship skills, Intercultural skills, Technical and Artistical skills. It includes fifty statements with three response options: ‘I can do this well’, ‘There is room for improvement’, ‘I don’t know how to do this’. The respondent is asked to illustrate his or her scores with personal examples. The tool offers guidelines on how to use the results in job interviews.	Yes
<b>*ASTE</b>	A questionnaire design intended to be used in a pre/post manner to assess how learners develop entrepreneurial competences, knowledge and attitudes. The measures are adjusted to suit primary, secondary as well as tertiary level of education. The measures have been tested in 13 European countries and they have been applied in multiple large scale field experiments, for example Youth Start Entrepreneurial Challenges.	Yes
<b>*OctoSkills</b>	OctoSkills is an impact assessment app that can be used by educators at different levels of education who wish to assess the impact they have on their students’ entrepreneurial competences, intentions and attitudes, as well as educational dimensions such as school engagement and educational motivation. It is based on the ASTEE-tool and includes a dashboard which can be used to develop the impact assessment and to compare results between different educational initiatives. It is designed for educators who want to assess their educational initiatives and school leaders who wishes to assess multiple classes.	Yes
<b>Enterprise Catalyst</b>	An online-tool where respondents can self-assess and get an overview of which category they “belong” to in five areas: Enterprise Fuel, Enterprise Style, Preferred Team role, Personal Learning and Thinking Styles.	To some extent
<b>Assessment and Teaching of 21st Century Skills (ATC21S)</b>	Melbourne university has in collaboration with Microsoft, Intel and Cisco developed a test of 21 <sup>st</sup> century skills: 1) Ways of thinking: Creativity and Innovation, Critical thinking, Problem-solving and decision-making and Learning to learn, metacognition. 2) Ways of working: Communication, Teamwork 3) Tools for working: information literacy, ICT literacy	To some extent

	4. Living in the world: Citizenship – local and global, Life & Career, Personal & Social Responsibility. After taking the module the participants get an overview of his or her score.	
<b>The GUESS Survey</b>	A survey focusing on the influence various entrepreneurial approaches, initiatives and programmes have on students. The survey design is based on the Theory of Planned behaviour, but it extends this by including aspirations and detailed information about the background of the participants and his or her experience with EE. It is more used as a research tool than evaluation feedback to educators.	Yes
<b>Entrepreneurship Mindset Index</b>	This tool is developed by NFTE (Network for Teaching Entrepreneurship). It is designed as a 30-item pre/post test aimed at assessing eight entrepreneurial dimensions: 1) Initiative & Self-Reliance, 2) Flexibility & Adaptability, 3) Communication & Collaboration, 4) Creativity & Innovation, 5) Critical Thinking & Problem Solving, 6) Future Orientation, 7) Opportunity Recognition, 8) Comfort with Risk. Designed more as a research tool and impact assessment than as an evaluation tool for educators. The dimensions and the item-structure can be applied by most educational programmes with some focus on business-oriented entrepreneurship.	Yes
<b>OICAT</b>	A performance test of opportunity recognition. The respondent is asked to come up with ideas based on a broadly defined context (such as meeting environmental challenges). The ideas are evaluated following a specific framework which makes it possible to assign a score to the participants.	To some degree
<b>SKILLOON</b>	Assessment for high school students focusing on six dimensions: 1) Trust, 2) Get to know yourself, 3) Cooperation, 4) Learn to set goals, 5) Practice success, 6) Path to future studies and working life. Each dimension is measured with multiple items, but the number of items are manageable for a young respondent. The respondent receive an individual feedback report with encouraging statements based on their responses.	To some degree
<b>Berkeley Innovation Index</b>	With only 18 items, seven dimensions deemed as being important when working with innovation are assessed. These dimensions are the following: 1) Trust, 2) Resilience, 3) Diversity, 4) Mental strength, 5) Collaboration, 6) Resource awareness, 7) Innovation zone. A short report is provided based on the responses.	To some degree
<b>Global Entrepreneurship Monitor (GEM)</b>	A long running survey (since 1999) of countries and regions entrepreneurial climate. The focus is on the entrepreneurial behaviour of individuals and on the policy climate.	To some degree
<b>EntreIntention</b>	A questionnaire based on the Theory of Planned Behaviour that is designed to assess impact with pre/post tests.	Yes
<b>LoopMe</b>	This tool is an updated version of the Experience Sampling Method and approaches impact assessment by applying the proxy method, i.e. asserts that certain behaviours and activities led to certain learning outcomes. The focus is on registering	To some degree

	which activities the learners participate in and which type of emotion these activities spur. LoopMe can be an efficient tool to use if the educator want to establish a dialog with the learners while they perform activities outside of the classroom (which is often the case in EE). In this way it creates a two-way formative assessment.	
<b>Measurement Tool Enterprise Education (MTEE)</b>	A web-based tool which allows educators to track how their entrepreneurial teaching methods develop over time.	To some degree
<b>Mind Cette Scale</b>	A multidimensional scale which aim to assess how the learners entrepreneurial mindset develop over time by using pre/post tests.	Yes
<b>* The Entrepreneurial Skills Pass</b>	This impact assessment is used as a certificate in JA's entrepreneurship programme Company Programme. A questionnaire focusing on entrepreneurial competences and the key competences that have been identified by the European Commission is distributed in a pre/post manner. In addition to this it provides test of declarative entrepreneurial knowledge that certify that the participant has viable entrepreneurial knowledge aligned to the learning goals of JA Company Programme.	Yes
<b>*SOCCES</b>	An assessment tool which is designed based on the 15 competences in the EntreComp framework. Various assessment methods are used to assess the 15 competences.	Yes
<b>*Entrepreneurial orientation and the entrepreneurial mindset</b>	A structured framework for assessing multiple dimensions characteristic for the entrepreneurial mindset. No structured impact assessment tool is designed, but established scales are proposed for each of the dimensions. These scales are intended to be used in separate, so the number of items included are unfortunately very extensive.	Yes