

Can Entrepreneurial Education Escape Being Caught Between Marginal ('the Devil') and Irrelevant ('the Deep Blue Sea') Practices?

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Questions we care about (Objectives). This article investigates the problematic situation that the common division into two main kinds of entrepreneurial education leaves many teachers 'caught between the devil and the deep blue sea'. On one hand, *entrepreneurship* education based on an organization creation focus remains marginalized due to its connotations with egoistic capitalism, making it difficult to integrate with most kinds of non-business education. On the other hand, *enterprise* education based on an opportunity recognition focus remains largely irrelevant due to its weak effects and vague state of being indistinguishable from the centuries-old progressive education movement. The article investigates the underpinning definitional starting points of these two established positions and contrasts them to a third novel definitional starting point based on new value creation, resulting in what is here termed 'value creation education'. A key question is posed: could a new definitional starting point help entrepreneurial education escape a precarious situation characterized by marginalization and irrelevance?

Approach. Six recent comparative impact studies conducted by the author and colleagues on 928 participants from all levels of education are reviewed. The six studies contrast three different kinds of entrepreneurial education based on three different definitional starting points. The studies were all conducted from 2012 to 2016 by the same team of researchers and with the same methodology, consisting of three different steps; (1) collecting emotional events from participants through a mobile app, (2) preparing, conducting and transcribing interviews with carefully selected students, and (3) analyzing the generated app and interview data. The six studies generated a total of 10855 completed mini-surveys from 928 participants and 300 in-depth interviews with students on all levels of education.

Results. Value creation education emerges as a possible escape from the dilemma of entrepreneurial education being caught between marginalization and irrelevance. Teachers no longer need to choose between effective but marginal practices and widely applicable but fuzzy and ineffective practices. Value creation education thus opens up a new solution space for entrepreneurial education theory and practice. It remains to be seen how large the new solution space is.

Implications. A definitional exploration has opened up new pathways towards higher relevance, applicability and impact of entrepreneurial education. Policymakers could thus need to reconsider many of the currently on-going initiatives to infuse entrepreneurship into education. The biggest potential for improvement of entrepreneurial education practice is likely to be found in enterprise education based practice. Nevertheless, a key question remains unanswered: What more unexplored definitional starting points for entrepreneurial education are out there?

Value / Originality. While almost all other impact studies in the field have been conducted on entrepreneurial education viewed only as organization creation, the six studies reviewed and contrasted here investigated entrepreneurial education based also on the two other definitional starting points outlined here. This has opened up for comparative conclusions and generation of further questions. A number of striking differences in characteristics and outcomes among the three different kinds of entrepreneurial education have surfaced empirically, indicating that entrepreneurial education based on new value creation could potentially be a way for teachers to escape being caught between the Devil and the Deep Blue Sea.

1 Introduction

This article investigates the problematic situation that the two main approaches to entrepreneurial education leave most teachers with only two inappropriate alternatives, in line with the common idiom: ‘being caught between the Devil and the Deep Blue Sea’. *Entrepreneurship education* lets students learn about and through starting a new venture, and is based on a definition of entrepreneurship viewed as organization creation (Gartner, 1989). It has remained marginalized due to its inability to integrate with most kinds of non-business education (Smith et al., 2006; Pittaway and Edwards, 2012). This in turn is often due to its inescapable connotations with capitalism and egoism (Johannisson, 2010), thus here assigned to the ‘Devil’ side of the idiom. *Enterprise education* lets students become more creative, innovative and opportunity oriented in general, and is based on a definition of entrepreneurship viewed as identifying and acting on opportunities (Shane, 2003). It has remained largely irrelevant due to its weak effects (Moberg, 2014b) and vague state of being indistinguishable from the centuries-old and multifaceted approach labeled ‘progressive education’ (Hägg, 2016; Leffler, 2009). It is here assigned to the other end representing a state of being buried in a ‘Deep Blue Sea’ – a large number of already existing, similar and disputed pedagogical approaches.

In order to avoid the conceptual confusion that two quite different approaches could result in, the term ‘entrepreneurial education’ has been proposed as a unifying term for entrepreneurship education and enterprise education (Erkkilä, 2000; Kyrö, 2006). In an attempt to define what is inherently ‘entrepreneurial’ in entrepreneurial education, a unifying corresponding definition of entrepreneurship has recently been proposed as a new foundation for entrepreneurial education (Neck and Greene, 2011; Blenker et al., 2011; Lackéus et al., 2016); that of viewing entrepreneurship as new value creation (Bruyat and Julien, 2001). Entrepreneurial education could thus be viewed as an overarching term signifying education that aims to develop competencies necessary to create new value. Based on this, the article therefore explores the following question: Can a new underpinning definitional starting point of entrepreneurial education represent an escape from the problematic state of teachers in the field being caught between the Devil and the Deep Blue Sea?

Six recent empirical impact studies comparing the three different kinds of entrepreneurial education outlined above are reviewed and contrasted here (Lackéus, 2014; 2016a; Lackéus and Sävetun, 2014; 2015; 2016a; 2016b). The six studies were all conducted from 2012 to 2016 by the same team of researchers and with the same methodology. They generated a total of 10855 completed mini-surveys from 928 participants and 300 in-depth interviews with students on all levels of education. Most of the interviews were transcribed verbatim and analyzed with a method inspired by Grounded Theory methodology (Corbin and Strauss, 1990). While almost all other impact studies in the field have been conducted on entrepreneurial education viewed only as organization creation, these six studies investigated entrepreneurial education based also on the two other definitional starting points outlined here. This has opened up for comparative conclusions and generation of further questions. A number of striking differences in characteristics and outcomes among the three different kinds of entrepreneurial education have surfaced empirically, indicating that entrepreneurial education based on new value creation could potentially be a way for teachers to escape being caught between the Devil and the Deep Blue Sea.

The article proceeds as follows. First literature is reviewed on the three different kinds of entrepreneurial education discussed here, including definitions, characteristics, aims and impact. Then the methodology applied in the six impact studies is outlined. Findings from the six studies are summarized, contrasted and analyzed. Implications for practice, policy and research are outlined, followed by conclusions.

2 Literature review on three approaches to entrepreneurial education

In this section the three different kinds of entrepreneurial education are described, along with the impact that has been evidenced from each kind in studies conducted. A summary is shown in Table 1.

Table 1. Comparison between three different kinds of entrepreneurial education. A focus on organization creation is compared to a focus on progressive education and a focus on value creation for others.

	Entrepreneurial education		
	<i>Entrepreneurship education:</i> entrepreneurial education about and through organization creation	<i>Enterprise education:</i> entrepreneurial education through progressive education	<i>Value creation education:</i> entrepreneurial education through value creation for others
Focus	Organization creation	An attitude to teaching	Value creation for others
Definition	Let students learn about and through organization creation	Let students learn by working in groups to create solutions around authentic problems and be engaged in general	Let students learn by applying their knowledge to create something of value to external stakeholders
Examples in practice	Students learn about the role of entrepreneurship in society and how to start a new organization Students start a new organization	Students work thematically in class or go on a study visit Teachers assume a new and different attitude to teaching	Students produce text or video useful or enjoyable for others Students help others with something they need help with
Observed impact	Weak / no development of curricular knowledge / skills Strong development of entrepreneurial competencies Strong increase of motivation	Development of curricular knowledge / skills Weak or no development of entrepreneurial competencies Increased motivation	Strong development of curricular knowledge / skills Strong development of entrepreneurial competencies Strong increase of motivation
Link to idiom	The Devil	The Deep Blue Sea	The Escape

2.1 The Devil: Entrepreneurship education as an effective but marginal educational practice

Entrepreneurship education is often defined as education that aims to develop competencies necessary to set up a new business venture (QAA, 2012). This aligns with a definition of entrepreneurship as being about creating new organizations (Gartner, 1989). It is relevant primarily in later stages of the education system and mostly for the minority of students interested in learning about business. This has resulted in entrepreneurship education being delivered as an elective subject in upper secondary schools and at universities / colleges. Common subtopics include idea generation, business plan writing, marketing, financing and management (Mwasalwiba, 2010). In upper secondary schools the mini-company concept delivered by Junior Achievement / Young Enterprise is the dominating delivery mode in many countries. At the university a common delivery mode is to rely on separate elective courses and programs managed by faculty. Entrepreneurship education is rare in primary and lower secondary schools. Intended effects of entrepreneurship education include economic growth (Kuratko, 2005), development of key competencies (Hytti and O’Gorman, 2004) and increased ability of citizens to address societal challenges (Volkman et al., 2009; Rae, 2010). Entrepreneurship education has shown to be difficult to integrate into non-business subjects and on lower levels of education, primarily due to its widely perceived capitalist connotations among teachers (Johannisson, 2010; Smith et al., 2006; Rae, 2010; Korhonen et al., 2012).

Numerous studies have been done to assess the impact of entrepreneurship education. Two recent meta studies have attempted to summarize the impact evidenced so far. Martin et al. (2013) found that entrepreneurship education leads to development of participants’ entrepreneurial competencies and to an

increased number of ventures started. Those ventures started by people having experienced entrepreneurship education also seem to do better than average. While the impact of entrepreneurship education is statistically significant, it is nevertheless weak from an effect size perspective. This does not imply that actual impact is weak. It could also be due to a number of methodological challenges in assessing the impact of entrepreneurship education, and due to lack of methodological rigor of many of the impact studies conducted. What however has clearly been shown is the strong positive impact of entrepreneurship education on many students' engagement levels (Chatzichristou et al., 2015).

To summarize, entrepreneurship education is effective but marginal in that it seems to lead to many desirable effects but is applicable only to a small minority of older students. The active resistance and passive disinterest from all but a few teachers in the education system is why it has been associated to the 'Devil' side of the idiom used in this article.

2.2 The Deep Blue Sea: Enterprise education as a diluted and irrelevant educational practice

Enterprise education is often defined as education aiming to develop competencies necessary to generate and realize ideas (QAA, 2012). This aligns with a definition of entrepreneurship as being about discovery and exploitation of new opportunities (Shane, 2003). Enterprise education is at times conflated with entrepreneurship education to also signify a narrow focus on business start-ups (Jones and Iredale, 2010). Here it is however used as a broader term meaning education that aims to make people more entrepreneurial, i.e. more creative, proactive, confident, self-reliant, persistent and opportunity oriented in general (Mahieu, 2006). This broader view makes enterprise education possible to embed into non-business subjects and on all levels of education, thus potentially relevant to all students. Instead of the clear focus of entrepreneurship education on learning about and through business start-ups, enterprise education is rather about a pedagogical shift in mind-set among teachers. The prescribed shift is to go from passive, formal and detached teaching of abstract content to student-centered, active, authentic and experiential learning from a creative process of participation (QAA, 2012; Kirby, 2007; Gibb, 1993).

There are striking similarities between enterprise education and progressive education. Progressive education is a centuries long tradition in education, prescribing to let students learn by working in projects, solving authentic problems in teamwork characterized by social, active and self-directed learning (Labaree, 2012; Dewey, 1938; Tynjälä, 1999; Jonassen and Land, 2000). Key proponents include Comenius (1657), Rousseau (1762/2003), Dewey (1938), Kilpatrick (1918), Montessori (1912), Jonassen (1999) and Kohn (2000). The most influential of them has been Dewey, who co-founded the underpinning philosophical movement of pragmatism together with James (1907) and Peirce (1878) more than a century ago. Dewey's emphasis on learning through experience leaned philosophically on pragmatism's focus on practical consequences and reject of theoretical "truths" (Roberts, 2012). Progressive education is today often labeled constructivist education, but with similar recommendations (Cuban, 2007).

A number of scholars have linked enterprise education to progressive education (Fletcher, 2007; Pepin, 2012; Mueller, 2012; Löbler, 2006; Kyrö, 2005). Critics of enterprise education have also claimed that enterprise education is a mere relabeling of progressive education, thus lacking a precise definition of what is unique with enterprise education (Hägg, 2016; Leffler, 2009). This puts enterprise education in a precarious situation of being immersed in a 'Deep Blue Sea' of existing and contested progressive education approaches such as problem-based learning, project based learning and constructivist learning (Savery, 2006; Blumenfeld et al., 1991; Tobias and Duffy, 2009).

What could save enterprise education from dilution into irrelevance would be studies showing its superiority in terms of impact of some desirable kind. Such studies are however virtually non-existent. Almost all studies focus on venture creation in some way, i.e. on entrepreneurship education rather than on

enterprise education. It is also difficult to study the impact of something that is not defined in a precise enough way as to permit reliable assessment of its impact (Pring, 2010). Jones and Iredale (2010, p.15) claim that 'a robust means of establishing the impact of enterprise education has yet to be determined'. A study that has tried to circumvent this definitional challenge was recently conducted by Moberg (2014b). Here enterprise education was defined as action-based teaching methods aimed at fostering creative thinking, idea generation skills, action orientation and proactiveness. The study found that while such teaching increased student engagement, it in fact rather lowered students' entrepreneurial intentions. These results are similar to two of the six studies forming the basis of this article (see sections 4.3 and 4.4). The very few impact studies that have been done on enterprise education thus show relatively weak effects.

2.3 The Escape: Value creation education as an escape from a conundrum

A recent stream of literature has attempted to clarify the meaning of 'entrepreneurial' in educational settings by drawing on work by Bruyat (1993), who defines entrepreneurship as a dialogic between the individual and the new value created¹. This definition specifies two key dimensions; novelty of the value created and resulting impact of the process on the individual. The more novel the value created and the more impact the process has on the individual, the more people tend to describe it as entrepreneurship (Bruyat, 1993, p. 69). Such a view implies that the development and change that the individual experiences is as important as the new value created by the individual. With such a strong focus on personal development, this is a definition of entrepreneurship that could be particularly relevant in education. While a value creation focus in entrepreneurial education has been discussed by a few scholars in the field (Fayolle, 2007; Sarasvathy and Venkataraman, 2011; Blenker et al., 2011; Neck and Greene, 2011), it is still nascent both in theory development and in educational practice. There is not yet an established term for this new kind of entrepreneurial education, so in this article it will be termed 'value creation education'. It is here based on the following definition: let students learn by applying their existing and future competencies to create something preferably novel of value to at least one external stakeholder outside their group, class or school (Lackéus et al., 2016). This definition can be shortened into *learning-through-creating-value-for-others*.

The only impact studies that have been done on value creation education are three of the six studies summarized in this article (Lackéus and Sävetun, 2014; Lackéus, 2016a; Lackéus and Sävetun, 2016a), see further in sections 4.2, 4.5 and 4.6. There are however a few illustrative case studies (Surlmont, 2007; Rodriguez-Falcon and Yoxall, 2010). Surlmont (2007) gives two examples from secondary education in Belgium where students acted as teachers for younger students and also helped other students learn a new language. These students displayed very high levels of creativity, engagement and motivation. They invested heavily in the process and acquired a higher level of subject matter knowledge than a control group of students. Rodriguez-Falcon and Yoxall (2010) give an example of when an entrepreneurship course was transformed into a value creation course. Instead of the usual assignment to write a business plan based on university research, engineering students were asked to learn by making life easier for the 7-year-old boy Kieran who suffered from severe cerebral palsy. This triggered huge emotional commitment in the entire class, and led to significant increases in student learning, satisfaction and employability compared to the previously applied approach. The emerging literature on value creation education thus shows that it triggers strong development of entrepreneurial competencies, strong development of more traditional curricular subject related competencies and significantly increased engagement among the students. These are very promising effects and constitute emerging empirical evidence that a different definitional starting point for entrepreneurial education could constitute an escape from the problematic situation of teachers being caught between the Devil and the Deep Blue Sea.

¹ Bruyat's seminal dissertation is in French, but parts of it have been translated by Fayolle (2007). There is also a summarizing article in English by Bruyat and Julien (2001).

3 Methodology used in the six empirical studies

The six empirical studies that form the basis for this article were all done with the same research methodology, here termed the 'proxy methodology'. It consists of three different steps; (1) collecting emotional events from participants through a mobile app, (2) preparing, conducting and transcribing interviews with carefully selected students, and (3) analyzing the generated app and interview data. The proxy methodology and its three steps is briefly outlined below. More in-depth descriptions can be found in many of the previous publications by the author of this article, see for example Lackéus (2014; 2016b).

3.1 The proxy methodology

The proxy methodology is based on the 'proxy theory' of how people develop entrepreneurial competencies, stipulating that emotional events can be considered intermediaries (i.e. proxies) between teachers' instructional design and students' developed entrepreneurial competencies (Lackéus, 2013; Lackéus, 2016b). Such an approach means that the emotional events that students experience in an educational setting represent a clear signal that some sort of entrepreneurial learning process is occurring. The resulting research design is then to use emotional events as signals of where to look for causal mechanisms governing how different teaching methods lead to different types of competencies, i.e. different kinds of knowledge, skills and attitudes. Competencies deemed entrepreneurial include knowledge about how entrepreneurs create value; skills in marketing, resource acquisition and opportunity identification; and attitudes such as entrepreneurial passion, self-efficacy, proactiveness and tenacity (Fisher et al., 2008).

The proxy methodology leans theoretically on the key role of emotional and critical learning events for developing students' entrepreneurial competencies (Souitaris et al., 2007; Kyrö, 2005; Gibb, 2002; Pittaway and Cope, 2007; Cope, 2003). It represents a more fine-grained causal model than the common and idealized deductive-nomological model where the cause is entrepreneurial education and the effect is either the developed entrepreneurial competence and/or the triggered entrepreneurial behavior (cf. Little, 1991, p.14-15). This allows for studying more in detail the plethora of causal mechanisms that mediate between cause and effect, potentially opening up the black box of how, when and why entrepreneurial competencies are developed through entrepreneurial education (Lackéus, 2014).

3.1.1 Step 1: Deploy a mobile app that collects students' emotional events

Already in the 1970s, psychology researcher Mihaly Csikszentmihalyi used short surveys to capture respondents' experiences directly in their natural environment, attempting to capture the 'flow' of everyday experience (Hektner et al., 2007). This method is called 'Experience Sampling Method' (ESM). By capturing subjective experiences with a previously unattained precision, a high level of validity can be obtained. Today the availability and widespread use of smartphones has drastically reduced the distribution and management cost of the ESM approach to capturing human experience (Conner, 2013).

In order to be able to use ESM for the empirical studies described in this article, a smartphone app called Loopme was developed². All participants in all six studies have been instructed to use this app to submit as many of the emotional events they experience related to the education through an 'app report' for each emotional event. Each app report starts with a mandatory free-text reflection describing the emotional event that has occurred. Then the participant makes an emotional categorization with a seven-step Likert scale from -3 to +3, where -3 represents a very negative emotional event and +3 represents a very positive emotional event. The participant also categorizes the event in accordance with a set of predefined metadata tags, illustrating salient themes and characteristics of possible emotional events. These tags are later used to facilitate further analysis. Finally the app report is sent to a chosen teacher / coach, either with the

² For more information on the smartphone app and its different uses for practice and research, see www.loopme.io.

participant's name attached or anonymously, making it visible to the teacher / coach but not to other participants in the study. All app reports from all participants are also made available to the research team, in accordance with written consent given by all participants (or by their parents if the participant is younger than 15 years old). When receiving a report, the teacher / coach can then interact in real-time with the participant through a chat functionality integrated into the app (also with anonymous participants), allowing the app to become a tool for daily student-teacher/coach interaction.

3.1.2 Step 2: Prepare, conduct and transcribe interviews

The primarily quantitative data collected in step 1 with the ESM based app report approach is in step 2 fed into a more qualitative phase, where interview respondents as well as topics to discuss are chosen largely based on app reports made. This could be regarded as an app report based sampling strategy as well as an app report induced interview template. These two key methodological steps have been shown to act as amplifiers, increasing the signal to noise ratio of subsequent steps in the research process. Choosing interviewees and issues to discuss with them based on relevancy allows the qualitative research phase to focus on the most relevant aspects of what teachers / coaches and participants are experiencing in the learning environments studied. Coupled with a multi-site research design it increases the possibility to identify and contrast theoretically relevant and coherent mechanisms in terms of if, how, when and why teachers / coaches succeeded in developing participants' entrepreneurial competencies.

The purpose of the interviews is to uncover links between instructional design, triggered emotional events and resulting entrepreneurial learning outcomes. Each interview is prepared by compiling a summary of the most interesting and relevant app reports made by the participant. A semi-structured approach is used for the interviews; introduction to the study (5% of time), general lessons learned by the participant (10% of time), app-induced questions around specific emotional events (50% of time), other crucial events in general (20% of time), what has motivated them (5% of time), similarities and differences between this and other learning environments (5% of time) and important decisions made by the participant lately (5% of time). Each time an emotional event is discussed, the participant is immediately and repeatedly asked to connect that event to any learning outcomes in terms of developed knowledge, skills and attitudes. These linkages between events and learning are later harvested in step 3. Each interview is around 45-60 minutes long and is recorded and transcribed verbatim. In many cases other key stakeholders than the student participant are also interviewed, primarily teachers and parents, applying a different interview structure.

3.1.3 Step 3: Analyze the collected data

All of the transcribed data from teacher interviews and student interviews is analyzed with interview coding software NVIVO. Open coding as well as axial coding is applied (see Corbin and Strauss, 1990, p.98). Two theoretical frameworks are applied; one for emotional events and one for resulting entrepreneurial competencies. The emotional events coding framework is a development of a framework constructed by Arpiainen et al. (2013). The entrepreneurial competencies framework is a development of a framework constructed by Fisher et al. (2008), and elaborated based on a number of different sources (Lackéus, 2014; Moberg, 2014a; Moberg et al., 2014; Leffler et al., 2010; Regeringskansliet, 2009).

After all interviews are coded, a number of tables are generated that support the analysis, such as app reports per metadata tag, common emotional events, common developed competencies and common links between emotional events and developed competencies. While such tables give a general overview over data and causal links in the data, they cannot replace in-depth qualitative analysis of patterns, mechanisms and the creative search for theoretical and generalizable insights. They are merely the entry point of deep analysis. Therefore, all generated tables inform a subsequent and unique final phase of thematic analysis in each study where the proxy methodology is applied. This final step differs from study to study, depending on purpose, research question and findings.

4 Findings

The findings from six studies employing the proxy methodology will first be summarized. Then a comparison of the three different kinds of entrepreneurial education will be done based on these six studies. An overview of the studies is shown in Table 2.

Table 2. Six impact studies employing the proxy methodology. The six studies comprised 928 participants, 10855 app reports and 300 interviews.

Nº	Focus	Context	Year	Stud- ents	App reports	Inter- views	Key conclusions
1	Entrepreneurship education	University	2012-2014	13	556	55	External interaction and value creation gives strong impact on entrepreneurial competencies.
2	Value creation education	Secondary school	2013-2014	7	33	26	Findings from study 1 valid also on younger students and when business focus is absent.
3	Enterprise education	Primary and secondary school	2014	83	1 058	28	Enterprise education has weak or no effect on students' entrepreneurial competencies.
4	Entrepreneurship and enterprise education	Secondary school, university and adult education	2014-2015	168	1 337	53	Findings from studies 1-3 confirmed. Entrepreneurship education is difficult to embed into non-business education.
5	Entrepreneurship and value creation education	Primary and secondary school	2015-2017	176	1 976	32	Findings from studies 1 and 2 around impact of value creation in education confirmed.
6	Value creation education	Primary and secondary school	2015-2016	481	5 895	76	Previous findings confirmed again. Mechanisms uncovered around why value creation in education gives such strong effects.

4.1 Study 1: Impact of entrepreneurship education on 13 university students

The first study employing the proxy methodology was done on 13 master level entrepreneurship program students at Chalmers University of Technology. They were followed from September 2012 to May 2014. 556 app reports of emotional events were submitted by the participants and 55 interviews of 1-1,5 hours with the participants were recorded and transcribed. Every 2-4 months a new wave of interviews was made. While the study was still ongoing, a subset of the data was analyzed and written up as a research article, analyzing the impact of an action-oriented entrepreneurship program on three of the participants in terms of developed entrepreneurial competencies (Lackeus, 2014). This was the first study to empirically illustrate the strong positive impact on entrepreneurial competencies and student engagement of letting students interact with external stakeholders to create something of real value to them. This analysis also illustrated the usefulness of the proxy methodology for establishing empirical evidence of micro-level causality between educational design and developed entrepreneurial competencies.

4.2 Study 2: Impact of value creation education on seven secondary school students

The second study employing the proxy methodology was done at two lower secondary schools in Sweden, following seven participants from October 2013 to January 2014. 55 app reports of emotional events were submitted by the participants. 21 one-hour student interviews were conducted in three interview waves; before, during and after the educational intervention. Five interviews were also conducted with parents and teachers. The intervention was a case of value creation education where students were asked to produce

and broadcast a 1-hour radio program. The production phase involved numerous external stakeholder interactions through interviews and sponsorship recruitment, and the radio program was expected to be perceived as valuable to a broad audience in the region. The analysis and resulting conclusions were documented through a report in Swedish (Lackéus and Sävetun, 2014), as agreed with the financing institutions. This report was never translated to English or published in a scholarly journal. Study 2 was the first study to employ the proxy methodology on secondary education level. The conclusions from Study 1 on university students were in Study 2 confirmed also on lower secondary school students. The strong positive impact on entrepreneurial competencies and student engagement of letting students interact externally to create value for others was evident also here. This study illustrated once again how the proxy methodology can provide empirical evidence of micro-level causality between applied pedagogy and resulting student learning.

4.3 Study 3: Impact of enterprise education on 83 primary and secondary school students

The third study employing the proxy methodology was done at two primary schools and one lower secondary school in Sweden, following 83 students from September to December 2014. The schools were selected for study based on their long history of applying enterprise education broadly and having received comprehensive training and support from leading enterprise education experts. 1058 app reports of emotional events were submitted by the participants. 25 one-hour interviews were conducted with some of the participants reporting education related emotionality. Three interviews were also conducted with the teachers involved. The classroom practices varied significantly, ranging from traditional lectures to thematic group work to study visits outside school. The study was however largely a disappointment in terms of development of entrepreneurial competencies. Only a few exceptions were found illustrating development of entrepreneurial competencies. The levels of student engagement were also much lower than in study 1 and 2. The analysis and resulting conclusions were documented through an extensive report in Swedish (Lackéus and Sävetun, 2015), as agreed with the financing institutions. This report was translated to English and is currently in review in a scholarly journal. New insights from this study included a conclusion that the proxy methodology can provide evidence also of what does not happen in an educational setting.

4.4 Study 4: Impact of entrepreneurship and enterprise education on 168 secondary school and university students

The fourth study employing the proxy methodology was done on four different secondary schools in Sweden working with enterprise education and on four different Swedish concept actors providing entrepreneurship education to students at secondary schools, at universities and to unemployed people. 107 participants were exposed to enterprise education and 61 participants were exposed to entrepreneurship education, resulting in 1337 app reports of emotional events from the participants from October 2014 to February 2015. 53 one-hour interviews were conducted with some of those reporting education related emotionality. The practices varied significantly, from traditional lectures and thematic weeks to one-day large-scale events, mini-company creation and real-life venture creation. The analysis and resulting conclusions were documented through an extensive report in Swedish (Lackéus and Sävetun, 2016b), as agreed with the financing institutions. It has not yet been translated to English. Study 4 confirmed the findings from Study 1-3 that entrepreneurship education has strong impact on developed entrepreneurial competencies and student engagement, and that enterprise education has weak if any impact on entrepreneurial competencies. Enterprise education showed a weaker increase in student engagement than entrepreneurship education. Entrepreneurship education showed weak if any impact on development of school related curricular knowledge and skills beyond entrepreneurship as a separate subject. This represents new empirical evidence showing and explaining why entrepreneurship education is difficult to embed into non-business subjects.

4.5 Study 5: Impact of entrepreneurship education and value creation education on 176 primary and secondary school students

The fifth study employing the proxy methodology was done in an EU project involving three different primary and lower secondary schools in Sweden, Norway and Turkey. The schools in Sweden and Turkey worked with value creation education in a number of different ways designed by the teachers involved, and the school in Norway worked with entrepreneurship education according to the Young Enterprise mini-company creation concept (Dwerryhouse, 2001) adapted to younger students. 176 participants were followed from October to December 2015. During this period they submitted 1176 app reports of emotional events. 32 of the participants reporting education related emotionality were interviewed. Analysis showed that the many interaction intensive value creation assignments triggered strong increase in student engagement and deep learning of curriculum knowledge and skills, especially in Turkey and Sweden. The most powerful learning environment was found in Turkey, where the teachers had carefully followed the instructions to let students learn by creating value for external stakeholders. The fifth study showed that value creation education can be as powerful or perhaps even more powerful than entrepreneurship education in terms of triggering student engagement and developing entrepreneurial competencies. It also illustrated the strong connections between value creation education and learning of curriculum knowledge and skills. Some of the analysis and resulting conclusions have been documented in a conference article (Lackéus, 2016a).

4.6 Study 6: Impact of value creation education on 481 primary and secondary school students

The sixth study employing the proxy methodology was done on 19 different primary and secondary schools around Sweden. Teachers included in the study all worked with value creation education to varying extent. Some were included based on snowball sampling of relevant practice, and others were extensively trained on value creation education in order to produce relevant practice to study. 481 students and their 35 teachers were followed from September 2015 to May 2016, submitting a total of 5895 app reports. Interviews were made with 63 students and 13 teachers. Respondents were selected based on information in app reports. The analysis and resulting conclusions were documented through an extensive report in Swedish (Lackéus and Sävetun, 2016a), as agreed with the financing institutions. It has not yet been translated to English. The analysis showed many kinds of positive impact of value creation education on student engagement, on entrepreneurial competencies and on school related curriculum knowledge and skills. The effect size was in some cases among the strongest found among all the six studies performed so far. Acting on the task to create something of value to external people made students passionate about creating value, and triggered a strong desire to learn more, to put more energy into school work, to take responsibility for oneself and others, to own the learning process to a higher extent and to learn knowledge and skills more in-depth, see Figure 1. There were many cases of students and teachers being fully convinced that value creation education results in higher grades for many students, due to the increases in student engagement and perceived meaningfulness of school work. Value creation education also had an unexpected effect of leading to a better social climate in the classes and fewer conflicts between students, thus relieving the teacher of the often time-consuming task of managing conflicts.

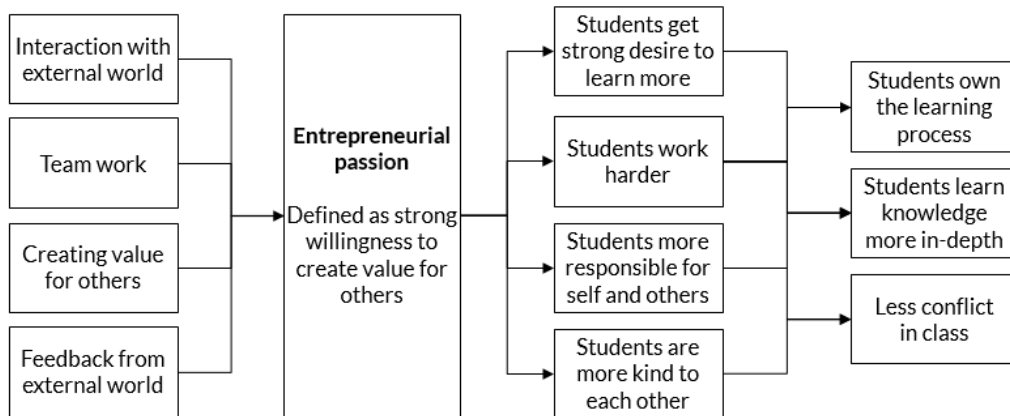


Figure 1. The role of entrepreneurial passion in value creation education. The model shows how entrepreneurial passion plays a key role in generating the strong positive effects of value creation education. Translated from Lackéus and Sävetun (2016a).

4.7 Comparison of the three different kinds of entrepreneurial education

Through the six conducted studies a number of similarities and differences between the three different kinds of entrepreneurial education have been observed. These are summarized briefly below. For an in-depth discussion around similarities and differences, see a more in-depth quantified comparison in the report from study 6, constituting detailed evidence for claims made here (Lackéus and Sävetun, 2016a).

4.7.1 Increase in student engagement / motivation

Value creation education and entrepreneurship education both show a strong increase in engagement and motivation among the participating students. Entrepreneurship education triggers engagement primarily through being about real-life entrepreneurship in terms of starting a company, managing real money and trying to create a profitable business. Value creation education does not at all rely on economic value for triggering engagement, but instead reaches the strong effects through the power of people's passion for making a real-life difference to others and to society at large. There is thus a similarity in effect but a difference in how this effect is produced. The difference is largely similar to that of self-oriented egoism versus others-oriented altruism. Entrepreneurship education leans primarily on commercial motives around wealth creation for oneself, whereas value creation education leans primarily on prosocial motives around meaningful creativity with others and a sense of belonging (Lackéus, 2016a).

Enterprise education does not give the strong impact on student engagement as the other two kinds of entrepreneurial education do. The moderate increase in student engagement from enterprise education is primarily related to variation in pedagogy, joy of working with a school subject and getting to learn more about it.

4.7.2 Development of entrepreneurial competencies

Value creation education and entrepreneurship education both result in strong development of entrepreneurial competencies. They both contain frequent instances of those emotional events that according to the proxy theory trigger development of entrepreneurial competencies (Lackéus, 2013; Lackéus, 2016b), such as interaction outside group / class / school, uncertainty / ambiguity in learning environment, teamwork over extended time periods and creation of value for others. This is however not the case for enterprise education. Enterprise education largely lacks the two most important kinds of emotional events; creation of value for others and interaction outside group / class / school. This difference was highly visible in the six conducted impact studies, and could thus to a large extent explain the large differences in impact on participants' developed entrepreneurial competencies. This means that taking the step from enterprise education to value creation education is quite easy in many cases. Study 3 in particular

illustrates that many examples of enterprise education could relatively easily be transformed into more effective practices simply by adding a possibility for students to interact outside group / class / school and try to create value for others. What they already do in class could easily be connected to an external audience or recipient of some potential value.

4.7.3 Development of curriculum knowledge and skills

Value creation education and enterprise education both lead to deeper learning of subject specific curricular knowledge and skills. The increase in engagement levels among students makes them work harder, pay more attention and learn more in-depth than they otherwise would. This effect is however stronger for value creation education. One reason for this could be the significantly higher levels of student engagement and motivation in value creation education illustrated in section 4.7.1, leading to much deeper learning. Such effects of motivation on learning have also been seen in previous research (Boekaerts, 2010; Linnenbrink and Pintrich, 2002).

Many of the six studies contain value creation education examples where students work harder than they have ever done before in their entire life. These are transformative and deeply emotional experiences that change their perspectives on many aspects in life, and that they will remember for their entire life. What value creation education does is to connect these powerful experiences to subject matter knowledge and skills in ways that entrepreneurship education does not do. Despite equally strong emotional engagement, entrepreneurship education shows a much weaker development of subject specific curricular knowledge and skills apart from entrepreneurship specific knowledge and skills. This illustrates the difficulties in embedding entrepreneurship education into non-business subjects observed in previous research (Smith et al., 2006; Handscombe et al., 2008). Study 4 confirms these difficulties, and provides reasons why this could be the case. Trying to infuse entrepreneurship education into non-business subjects results in a clash, both in terms of humanistic others-oriented versus capitalist self-oriented values and in terms of traditional versus progressive and experiential educational philosophies (Lackéus and Sävetun, 2016b; Lackéus, 2016b). If the aim is to reach a strong impact on all three factors compared here, the only kind of entrepreneurial education able to deliver on this is thus value creation education.

4.7.4 Other similarities and differences

Value creation education and enterprise education can both be managed independently by a teacher, as they are relatively easy and straightforward to get started with. Entrepreneurship education on the other hand requires access to both specialized business expertise, professional services and conceptualized teaching materials in order to be delivered. It is also much more complex to ask of students to start a business as formal part of their education. This means that the cost for entrepreneurship education is significantly higher than for the two other kinds of entrepreneurial education. The strong effects of entrepreneurship education have previously motivated such differences in cost and complexity. Now that equally strong effects can be reached at a lower price and with less complexity with value creation education, the cost / benefit relationship is different in favor of value creation education. This has important policy implications, as discussed in the report from study 6 (Lackéus and Sävetun, 2016a). The kinds of interventions that are prioritized and financed by policymakers could change in the future due to these differences. New kinds of concepts based on value creation rather than venture creation could emerge that outperform and thus outcompete the entrepreneurship education based concepts in many educational institutions.

Another observed difference between the three kinds of entrepreneurial education is the level of fuzziness. Entrepreneurship education and value creation education both rely on a precise definition and are thus both easy to present to and discuss with teachers. Enterprise education is significantly more fuzzy in terms of what it is and is not, which makes it more complicated to infuse into and manage in an educational institution.

5 Discussion

The findings from the six studies are now discussed. First some implications for practice and policy are discussed. Then some important limitations and questions raised by the positive findings here are discussed. Finally some possible future directions for research are given.

5.1 Multiple, broad and strong positive effects on students

Value creation education has shown to be a possible escape from the dilemma of entrepreneurial education being caught between marginalization and irrelevance. Teachers no longer need to choose between effective but marginal practices and widely applicable but fuzzy and ineffective practices. Value creation education is widely applicable in that it integrates well with a wide range of subjects on all levels of education. It gives strong effects in all three main areas examined here; entrepreneurial competencies, student engagement and subject matter knowledge and skills. It removes much of the complexity associated with entrepreneurship education. It also removes the definitional fuzziness and question mark around effects associated with enterprise education. The six studies conducted thus imply that value creation education opens up a new solution space for entrepreneurial education theory and practice. It remains to be seen how large this new solution space is. Based on this, time and effort invested by teachers and other practitioners into value creation education is most likely well spent. This is particularly so for practitioners in enterprise education where the step needed to take in order to reach a much stronger effect is small.

5.2 A new situation for policymakers

Given the results reported here, policymakers could need to reconsider many of the currently on-going initiatives to infuse entrepreneurship into education. Value creation education can be viewed as both a more effective and more efficient way forward than both entrepreneurship and enterprise education. For existing activities, it is now arguably worthwhile to investigate how they could be strengthened by considering how value creation education can be integrated to complement them.

Value creation education also opens up for new objectives when infusing entrepreneurship into education. Given the strong effects on learning of subject matter knowledge evidenced here, initiatives to infuse entrepreneurship into education can now contribute with improvements at the heart of education. This means that entrepreneurial education no longer needs to rely on economic policy objectives such as economic growth and employability, but can be connected directly to educational policy objectives such as making students learn more and raising results in various rankings of student performance of importance to policymakers. Such alignment with established key objectives of education could facilitate the diffusion of entrepreneurial education significantly. It could also align better with teachers' views of what is important to prioritize by removing the value clash around economic policy objectives and instead rely solely on educational policy objectives, viewing any fulfilled economic policy objectives as a bonus.

5.3 Some critical questions raised

The idiom 'caught between the Devil and the Deep Blue Sea' captures a situation where one is caught between two unpleasant choices. Another way to view such a dilemma is that of a tradeoff. Weick (1979, p.35) has emphasized the importance of acknowledging tradeoffs in social science, paraphrasing Thorngate (1976) by stating that 'it is impossible for a theory of social behavior to be simultaneously general, accurate, and simple'. Transferred to the topics treated here, is it then impossible for an entrepreneurial education practice to be simultaneously effective, widely applicable and precise? What if it is a generic and unavoidable aspect of social life that what is gained in generalizability and applicability when going from entrepreneurship to enterprise education is lost in precision and effectiveness? If this is the case the prospect of finding an escape from such a generic tradeoff, a panacea in the form of a magic bullet, might seem both slim and unrealistic here. Articulating a new educational practice grounded in entrepreneurship that gives stronger effects, wider applicability, higher definitional precision and lower hurdles for implementation and

diffusion than previously established approaches might thus be viewed as highly unrealistic. If anyone would claim to have found such an escape, the level of evidence required to accept and trust such a statement would indeed need to be put high.

Interpreting the large amounts of empirical data on the three kinds of entrepreneurial education that have been collected here thus needs to be approached with significant caution and by keeping a critical stance. The findings from the six studies give such a positive image of value creation education that one inevitably needs to question whether the findings are simply too good to be true. Questions need to be stated by outsiders around whether the data has been collected in a trustworthy way, whether the research team has interpreted the data in appropriate ways, and whether the innovative methodological process applied is robust and fit for the purpose here. For this reason the texts presenting the six studies are in many cases quite long, disclosing the findings in a very detailed way with a large number of participant quotes and quantifications of the data. Unfortunately many of the texts are in Swedish, making critical scrutiny of the material more difficult for non-Swedish scholars. This is an effect of the six studies having been financed in rather untraditional ways. Most of the around 30 different financiers of these studies have not regarded it to be research but rather viewed it as organizational and pedagogical development work. They have then not been interested in financing the dissemination of any results in international scholarly outlets. It is thus important to keep in mind the risk of overstating the results here.

Notwithstanding the above, the results disclosed here could very well be a breakthrough in the field of entrepreneurial education. They could potentially redefine the scholarly field as well as the prescribed practices for teachers, policymakers and other key stakeholders.

5.4 Future scholarly work

The most obvious future work for scholars is to corroborate the results presented in this article. The empirical data has been collected by one single research team using one single mix of methodologies. It would probably be valuable for practitioners if other research teams conducted research on value creation education to see if they see similar effects and causal mechanisms. Such research would be particularly needed in higher education institutions since the largest study on value creation education conducted so far had no higher education students included (study 6, see section 4.6). Another area where the impact of value creation education could be studied is vocational education. It is perhaps the most natural application of value creation education, with numerous examples of programs and courses where students learn through creating value for others as apprentices. If value creation education is as powerful as implied here, these effects would most likely be visible also in vocational education.

Another area for further investigation is to explore whether value creation education results in such an increase in relevance of entrepreneurial education that it can be viewed as a major improvement to the much wider scholarly fields of progressive and general education. It has been stated that value creation education can address one of the most vexing challenges in general education, the gap between traditional and progressive education (Lackéus et al., 2016). More research is needed to explore whether this is indeed the case in practice, and what a successful bridging implies for education.

The emergence of value creation education poses new semantic challenges. Is 'value creation education' an appropriate term, or should it be subsumed under either of the established terms? And what does the overarching term 'entrepreneurial education' signify given the addition of a value creation perspective? If 'entrepreneurial' in education signifies education where students get to learn by creating value for others, with or without a focus on venture creation, what should then the practice of educating about entrepreneurship be termed? This form of education has traditionally been termed entrepreneurship

education, but would be excluded from the overarching term 'entrepreneurial education' if it is defined as students learning through creating value for others.

Another question that could be explored is what other definitional starting points are out there. The results from the six studies presented here prompted the research team to articulate a definitional starting point based on new value creation (Lackéus et al., 2016). There are however more definitional starting points out there, such as viewing entrepreneurs as being innovative, as growing something, as possessing certain traits, as taking risks, as coordinating resources and as behaving in accordance with a staged process model (Aldrich, 2005; Moroz and Hindle, 2012; Howorth et al., 2005). Each and every of these and other definitional starting points can have relevance for entrepreneurial education as a starting seed of educational practice. A definition's high or low usefulness when studying and understanding entrepreneurship does not necessarily reveal its usefulness in educational settings. This implies that such definitional experimentation is largely uncharted territory in a scholarly field of entrepreneurial education currently firmly based on one or perhaps two definitional starting points; organization creation and opportunity recognition.

The proxy methodology employed in the six studies presented here could also be used to explore other issues in education research. Given the key role that emotions play for learning (Boekaerts, 2010; Postle, 1993; Dirkx, 2001), emotional events are arguably relevant also for other kinds of education than those explored here.

6 Conclusions

This article set out to investigate the dilemma most teachers are faced with when having to choose between two established but problematic approaches in entrepreneurial education. Through a comparison and contrasting of six different impact studies, an escape from the dilemma was generated and evaluated. The six studies contrasted the two established kinds of entrepreneurial education with a third kind building on a value creation based view of entrepreneurship, here termed 'value creation education'.

Value creation education was shown to be widely applicable by integrating well on all levels of education and giving strong positive effects on entrepreneurial competencies, student engagement and subject matter knowledge. It removes much of the complexity associated with entrepreneurship education and also the definitional fuzziness associated with enterprise education. Value creation education was thus found to open up a new solution space for entrepreneurial education theory and practice.

Policymakers now need to reconsider many of the currently on-going initiatives to infuse entrepreneurship into education. Value creation education is arguably a more effective and efficient practice than both entrepreneurship and enterprise education in many situations. Entrepreneurial education also no longer needs to rely on problematic economic policy objectives causing a value clash for teachers, but can instead be connected directly to educational policy objectives of improving student learning and achievement.

While potentially a breakthrough for the field of entrepreneurial education, these results give such a positive image of value creation education that one needs to question whether the findings are too good to be true. Other research teams now need to corroborate the results presented in this article and see if they can be reproduced in other settings and with other methodologies. The emergence of value creation education also poses new semantic challenges that need to be discussed. Finally, there could be other definitional starting points out there that have not been explored and that could be useful for educational practice.

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