

How can Entrepreneurship Bridge Between Traditional and Progressive Education?

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Questions we care about (Objectives). In this paper we argue that the “fault line” between traditional and progressive education starts in the domain of philosophy of science, passing through general educational philosophy and its century-long battle for control over instructional design practices, and ends up in the entrepreneurial education domain. This paper then asks the question: How can entrepreneurship contribute with cognitive tools that bridge between traditionalist and progressivist educational perspectives? Cognitive tools are defined by Egan (2008) as “the things people think with, not the things they think about”.

Approach. First we outline theory within the domains of entrepreneurship and education. We describe entrepreneurship as a method, as well as some cognitive tools that mediate learning. We then outline five main dualisms that span the entire proposed “fault line”, and create a conceptual framework around these five dualisms. Finally we discuss two possible ways in which entrepreneurship can contribute with tools that bridge and balance these dualisms, and propose some implications for research and practice.

Results. The analysis has yielded five dualisms that are described more in-depth. Attempting to bridge and balance between these dualisms we end up with five resulting questions: How can entrepreneurship contribute with cognitive tools that...

1.simplify a complex, multidisciplinary and holistic constructivist learning environment?
2.preserve the concrete and individual aspects in a social learning environment?
3.inject more content and linearity into an iterative learning process?
4.facilitate detached reflection in an emotional and action-oriented learning environment?
5.absorb more theoretical knowledge into an experiential learning environment?

These five resulting questions are tested on two candidates for cognitive tools that can mediate learning; value creation and entrepreneurship as a method. Both of these candidates seem to be quite constructive means to balance between traditional and progressive education.

Implications. For researchers this opens up for new opportunities to consider entrepreneurship theory and practice as pedagogical cognitive tools in general education. For practitioners this can serve as inspiration for trying out some of the vast array of tools, models and concepts from the entrepreneurship domain in general education. Further inquiry into the entrepreneurship domain can surface more cognitive tools of potential use.

Value / originality. Research that leverages profoundly on theory from both entrepreneurship and education is scarce. This specific attempt has potential to lead to a flexible yet criteria based “third way” between the rigidity of traditional education and the vagueness of progressivism. It also holds potential to bridge the gap between advocated and applied pedagogy in the field of education, where desired pedagogical approaches often are not used in practice due to the higher cost of such approaches and their misalignment to the conventional educational systems and paradigms.

Keywords: Entrepreneurship, Education, Cognitive tools, Dualisms, Value creation, Learning

Introduction

According to many scholars, entrepreneurship and enterprise education is preferably delivered using a learner-centered, multidisciplinary, process-based and experiential approach (Cotton, 1991, Gibb, 1987, Mwasalwiba, 2010). This is well aligned with progressive and constructivist learning environments, where social interaction, co-construction of knowledge, social immersion and collaborative learning are emphasized (Jonassen, 1999, Tynjälä, 1999, Woods, 1993). These conceptions of what constitutes effective education have however had substantial difficulties reaching a wider adoption in educational practice, both within and outside of entrepreneurship (Neergaard et al., 2012, Labaree, 2005, Mwasalwiba, 2010). The prevailing paradigm in most educational institutions rather emphasizes standardized tests, individual work, and detached theorizing (Jeffrey and Woods, 1998). The persistence of a more traditional view is exemplified through the ‘No child left behind’ act passed in 2001 in United States, putting increasing pressure on nation-wide standardized testing (Heckman, 2006). This culture of measurement seems to have strong positivist connotations, in that it leans on the belief that intelligence, learning and knowledge can be quantitatively measured, an increasingly questioned proposition (Gould, 1996, Rushton and Juola-Rushton, 2008, Biesta, 2007). A result of this situation is widespread problems with learners’ motivation, frequent school dropout (Fredricks et al., 2004) and a view that educational institutions to some extent fail to be relevant in today’s society (Binks et al., 2006).

In this paper we argue that the “fault line” between traditional and progressive education indeed starts in the domain of philosophy of science with the binary opposition between positivism and interpretivism, passing through general educational philosophy and its century-long battle for control over instructional design practices (Labaree, 2005), and ends up in the entrepreneurial education domain with its scholars advocating an approach that just does not seem to be able to reach widespread adoption due to paradigmatic challenges in education (Mwasalwiba, 2010, Ardalán, 2008). This kind of dualistic problem in learning and education has previously been addressed by Hager (2005), who instead recommends “a holistic integrative emphasis that aims to avoid dualisms such as mind/body, theory/practice, thought/action, pure/applied, education/training, intrinsic/instrumental, internal/external, learner/world, knowing that/knowing how, process/product, and so on ” (p. 663).

In line with Hager’s recommendation, Egan (2008) proposes the use of cognitive tools as a “third way” in education, where the first two ways are represented by traditionalism and progressivism respectively. These cognitive tools are defined by Egan as “things that enable our brain to do cultural work” (ibid, p. 40), and “the things people think with, not the things they think about” (ibid, p.14). Egan has been heavily inspired by Vygotsky and his description of the role mediation plays in learning (Egan and Gajdamaschko, 2003), such as more experienced humans (teachers and parents), symbols (written language) or in recent time learning mediated by information technology, as explored extensively by Jonassen (2002).

Recently, Sarasvathy and Venkataraman (2011) proposed that entrepreneurship could be regarded as a generic method for creating potentially valuable change by unleashing human potential, and contrasted this to the scientific method designed to harness mother nature. This was building on Sarasvathy’s (2001) work on ‘effectuation’, i.e. the iterative process of entrepreneurially creating some kind of effect based on the resources at hand and acquired along the way, mirroring how expert entrepreneurs work. We posit that this generic entrepreneurial method has potential to offer tools that humans think with (and not only think about), in line with Egan’s proposed cognitive tools, and thus can become a valuable contribution to the “third way” in education. This paper thus asks the question: How can

entrepreneurship contribute with cognitive tools that bridge between traditionalist and progressivist educational perspectives?

This paper proceeds as follows. First we outline some relevant theory within the domains of entrepreneurship and education. We describe entrepreneurship as a method, as well as some cognitive tools that Egan has proposed to mediate learning. We then outline five main dualisms that span the entire proposed “fault line”, from philosophy of science through education to entrepreneurial education and entrepreneurship as a method, and create a conceptual framework around these five dualisms. Finally we discuss possible ways in which entrepreneurship can contribute with tools that balance these dualisms, and propose some implications for research and practice.

Theory

Defining entrepreneurship

Entrepreneurship today is a fragmented concept. However, for the purpose of this article, the definition proposed by Bruyat and Julien (2001) is described briefly and will later serve as a basis for analysis. They use a constructivist approach and propose a definition incorporating not only the entrepreneur, but also the new value created, the environment within which it takes place, the entrepreneurial process itself and the links between these constructs over time. They not only agree with Gartner (1988) that “Who is an entrepreneur?” is the wrong question. They also argue that that studying the entrepreneur in isolation is inherently wrong, as it is not solely from the entrepreneur that entrepreneurship occurs. Entrepreneurship is as much about the change and learning that the individual entrepreneur experiences by interacting with the environment as the change and value creation the entrepreneur causes through his/her actions. Regardless of if the process results in a start-up¹, the change and learning for the individual can be substantial in an entrepreneurial process. This definition has implications for our discussion here, since it proposes learning for the individual as an inherent and core outcome of an entrepreneurial process alongside new value creation.

Entrepreneurship as a method

Sarasvathy and Venkataraman (2011) argue that viewing entrepreneurship as a subset of economics or any other sub-domain entails the risk of committing a logical category mistake, i.e. to allocate “concepts to logical types to which they do not belong” (Ryle, 1949)(p.17). Instead they propose that we should “reformulate entrepreneurship as a method of human action, ... a powerful way of tackling large and abiding problems at the heart of advancing our species.” (Sarasvathy and Venkataraman, 2011). They propose that a dominant logic for the entrepreneurial method is “effectuation”, a concept developed by Sarasvathy (2001) through observing how expert entrepreneurs think and act. Effectuation is described as an iterative process of decision making and active commitment seeking that results in creation of new value, where each iteration is started with questions such as “Who am I?”, “What do I know?” and “Whom do I know?” (Sarasvathy and Dew, 2005). Sarasvathy and colleagues position effectuation as an alternative to an objectivist, linear, transaction and causal logic based scientific method aiming to uncover general “laws” (Sarasvathy, 2001, Sarasvathy and Dew, 2005, Sarasvathy and Venkataraman, 2011, Venkataraman et al., 2012). They emphasize the subjectivist and constructivist nature of the entrepreneurial method, and specify

¹ Here we recognize ‘start-up’ to include not only the creation of a new firm, but also the adoption of a new product or project within an existing organization, or a new social impact initiative that is driven by a self-sustaining economic base (i.e. none philanthropic).

the intersubjective as a key unit of analysis, i.e. emphasizing social relations between people as more useful for decision making when operating under uncertain conditions. Thus they recognize that individuals operating under uncertainty in a process of emergence utilize knowledge learned through the constructivist and progressivist principles outlined in this paper.

Entrepreneurship and enterprise education

The domain of entrepreneurship and enterprise education is as fragmented as its underlying domain of entrepreneurship, due to the challenge of defining entrepreneurship (Mwasalwiba, 2010). This profoundly affects educational objectives, target audiences, course content design, teaching methods and student assessment procedures, leading to a wide diversity of approaches. The term “enterprise education” builds upon a broader conceptualization of entrepreneurship, aiming to help people adopt a more enterprising attitude, i.e. opportunity-oriented, proactive, flexible and open to change, uncertainty and risk (Mahieu, 2006). The term “entrepreneurship education” is perceived more narrowly, aiming to give people the knowledge and skills needed to become self-employed and develop a new business. Despite the differentiating desired outcomes of entrepreneurship and enterprise education, there is increasing consensus among scholars in the field that if the objective is to generate individuals capable of practicing entrepreneurship, then a preferred entrepreneurial pedagogy is learner centered, interdisciplinary, process-based, co-creation oriented, experiential and socially situated (Mwasalwiba, 2010, Gibb, 2011, Kyrö, 2008, Cotton, 1991, Gibb, 1987, Ollila and Williams-Middleton, 2011). Frequently mentioned underlying theoretical concepts for this kind of pedagogy are social learning (Bandura, 1997), situated learning (Lave and Wenger, 1991), experiential learning (Kolb, 1984), action learning (Revans, 1971) and emotional intelligence (Goleman, 1995). Advocated entrepreneurship education pedagogy fits well within the constructivist educational paradigm. There is however considerable gap between preferred and applied pedagogy, often due to the higher cost of active approaches and their misalignment to the conventional educational systems and paradigms (Mwasalwiba, 2010, Ardalan, 2008).

The battle between traditional and progressive education

According to Egan (1996), the battle between traditional and progressive education cannot be understood without taking into account the three main goals of education; achieving social cohesion, diffusing inherently valuable knowledge and facilitating growth of the individual mind (Egan, 2008). These three goals are in many ways conflicting. For example, it can be seen as contradictory to have a standardized curriculum while also allowing for full heterogeneity and adaptation to individual needs. And it is not obvious what knowledge is ultimately valuable for society, or for the individual. In this battle between competing positions, traditional education has been the predominant approach for a more than a century, which emphasizes social cohesion and knowledge diffusion. A main reason for this dominance, according to Labaree (2005), is that in the end utility won over romanticism, with a message more appealing to people in power and with far more convincing quantitative test results proving the behaviorist approach proposed by Edward Thorndike. On one side of this debate stood policymakers and school management, with power over administrative and curriculum structures, opting for a standardized curriculum, dissemination of inert knowledge to passive learners in a knowledge focused linear manner emphasizing individual results through the summative test measures applied (Egan, 2008, Tynjälä, 1999). On the other side stood teachers and professors of education arguing for a learner focused and process-based curriculum supporting active and emotional learners, emphasizing meaning generated through

practical experiences involving social interaction (Tynjälä, 1999, Jeffrey and Woods, 1998). To date, the focus has been on what learners “need” rather than on what they might “like” (Labaree, 2005), and it has resulted in a widespread “increasing score, declining interest” problem among learners, causing policymakers to act in many countries, ironically by increasing pressure on testing and standardization (Egan, 2008)(p. 91).

Cognitive tools as a “third way” in education

Learning can be mediated by a variety of tools. Leo Vygotsky proposed three main categories of mediation tools; material tools, psychological tools and other human beings (Kozulin and Presseisen, 1995). Feuerstein (1990) stipulates three main criteria for effective mediated learning; purposeful rather than incidental interaction, possibility for the learner to identify underlying principles and infusion of meaning into the interaction. These three criteria make mediated learning incompatible with behavioristic approaches according to Kozulin and Presseisen (1995).

Jonassen (Jonassen, 2003) has explored the use of cognitive tools for problem solving through scaffolding the students’ problem representation. These cognitive tools are often computer based and include techniques such as semantic networks, expert systems and systems modeling tools. Computers are here often regarded as part of the students’ cognitive apparatus, i.e. they think *with* the computer. The rationale for this kind of mediation is that it decreases the cognitive load and makes possible solutions more transparent (Simon, 1978).

In what has been labeled Imaginative Education (IE), Egan (1997, 2003, 2005, 2008) has proposed an extensive range of cognitive tools that mediate learning for example by infusing humor and emotions into the learning situation; by using storytelling to create a sense of meaning and purpose; by leveraging on emotionally charged binary opposites and extremes to give shape and meaning to events; by telling stories about the heroes behind important theorems and axioms; and by being open to anomalies. The school days can be divided so that in the morning learners focus on knowledge acquisition and in the afternoon they focus on socially connected projects where the knowledge is put to use through these cognitive tools (ibid, p.147). The IE approach has spurred a global movement with thousands of educators applying these tools. Research by psychologist Harris (2000) supports this approach, showing that imagination is important for cognitive development and learning, and plays an important role for developing emphatic and social skills (Kind and Kind, 2007). Quantitative research has also shown that the IE based storytelling approach can yield significantly better results on knowledge specific tests without taking more time in class (Hadzigeorgiou et al., 2012), and at the same time significantly increase learner engagement. According to Egan (2008), the way cognitive tools truly can bridge between traditional and progressive education is when they are put to work deeply within domains of knowledge in a way meaningful to the learner. Procedures, methods and tools need to be deeply tied into knowledge domains in actual possession by the learner, which requires substantial effort and dedication from both teachers and learners. This approach thereby constitutes a flexible yet criteria based “third way” between the rigidity of traditional education and the vagueness of progressivism (ibid, p. 143).

Based on this review of theory we will now attempt to construct a conceptual framework.

Conceptual framework

The literature reviewed above contains many two-column tables contrasting positions. It also contains frequent contrasting formulations, outlining one phenomenon by relating it to its corresponding opposing position. These contrasts were used to create a framework. In order to

construct such a framework cutting across these very different domains, one needs to be relatively flexible and selective in selection and interpretation of words and meaning. This then becomes a major limitation of such a framework, since theory developed in one domain cannot easily be transferred to another domain without risk of losing its trustworthiness. Still, the similarities in use of words, phrases and meaning have at times been striking when reviewing these disparate strands of literature.

We have focused this framework on five main dualisms. They could probably be more, or less, or structured differently, but these five dualisms constitute one way to present some seemingly common traits of the “fault line” cutting across the reviewed literature. The scholars chosen as references in this framework are far from the only ones that state these views, they could be regarded as relatively representative of their respective fields. The five dualisms identified are presented in figure 1 and discussed below.

| POSITIVISM TRADITIONAL EDUCATION TRADITIONAL EDUCATION SCIENTIFIC METHOD | | INTERPRETIVISM PROGRESSIVE / CONSTRUCTIVIST EDUCATION ENTREPRENEURIAL EDUCATION ENTREPRENEURIAL METHOD | |
|---|----------------------------------|---|--|
| | Simplicity | Complexity | |
| Science as... | ...reductionist | ...holistic | (Deshpande, 1983; von Bertalanffy, 1972) |
| Learning as... | ...standardized | ...localized and child-centered | (Tynjälä, 1999) |
| Entrepreneurship education as... | ...single-subject | ...multidisciplinary | (Cotton, 1991) |
| A method to... | ...harness nature | ...unleash human nature | (Sarasvathy and Venkataraman, 2010) |
| | Individual | Social | |
| Scientist regards... | ...reality a concrete structure | ...reality a social construction | (Cunliffe, 2011) |
| Learning as... | ...individual work | ...social interaction / storytelling | (Jeffrey and Woods, 1998; Egan, 2008) |
| Entrepreneurship education as... | ...know-that | ...know-who and know-how | (Cotton, 1991) |
| A method for the... | ...objective | ...intersubjective | (Sarasvathy and Venkataraman, 2010) |
| | Content | Process | |
| Science process... | ...linear | ...iterative | (Cunliffe, 2011) |
| Learning activities with... | ...product focus | ...process focus | (Jeffrey and Woods, 1998) |
| Entrepreneurship education as... | ...content | ...process | (Cotton, 1991) |
| A method that is... | ...linear | ...iterative | (Sarasvathy, 2001) |
| | Detached | Attached | |
| Science should be... | ...dispassionate / value free | ... meaning-making / ...value-bound | (Cunliffe, 2011; Lincoln and Guba, 1985) |
| A classroom where... | ...learner is passive | ...learner is active and emotional | (Tynjälä, 1999; Egan, 2008) |
| Entrepreneurship education as... | ...absolute detachment | ...emotional involvement | (Gibb, 1987) |
| A method that is... | ...transaction based | ...commitment based | (Sarasvathy and Dew, 2005) |
| | Theory | Practice | |
| Science about... | ...objective reality | ...lived experience | (Weber, 2004) |
| Learning focusing on... | ...inert knowledge | ...practical experiences | (Tynjälä, 1999; Egan, 2008) |
| Entrepreneurship education with... | ...emphasis on theory | ...emphasis on creation | (Ollila and Williams Middleton, 2011) |
| A method for... | ...observation & “law” discovery | ...action & co-creation | (Sarasvathy and Venkataraman, 2010) |

Figure 1. Five different dualisms cutting across four different literature domains.

Simplicity versus complexity

Deshpande (1983) describes an objective worldview as being outcome-oriented and reductionist, and contrasts it to the subjective worldview being process-oriented and holistic. This resonates with the contrasting views between on the one hand the reductionist Cartesian view that any complex phenomenon can be reduced to and understood through its smallest

and most simple parts, and on the other hand a systems view where holistic understanding is needed in an increasingly complex and interdisciplinary world, a theory originating from the domain of biology (Von Bertalanffy, 1972). Similar discussions can be found in general and entrepreneurial education, where a focus on standardized and single-subject curriculum is contrasted with a localized and multidisciplinary approach in entrepreneurial and constructivist education (Tynjälä, 1999, Cotton, 1991). Jonassen (1999) states that there can indeed be a great range of complexity in setting up a constructivist learning environment, but also asserts that it is a pedagogical approach particularly suitable for ill-defined and complex tasks. In their work on entrepreneurship as a method, Sarasvathy and Venkataraman (2011) state that “the phenomenon of entrepreneurship exhibits heterogeneity along several dimensions and across every aspect of research” (p. 127). They contrast the harnessing of mother nature with the unleashing of human nature, which could also be interpreted as on two different ends of the simplicity versus complexity continuum, i.e. harnessing for simplifying the human use of natural resources versus unleashing the complexity and heterogeneity of human nature for value creation purposes.

Individual versus social

Cunliffe (2011) states that the subjectivist approach is to perceive reality as a social construction, which is contrasted to the objectivist view that reality is a concrete given. In education the social dimension also plays an important role in progressive and entrepreneurial education (Egan, 2008, Jeffrey and Woods, 1998, Cotton, 1991), and is frequently contrasted to the individually focused information-processing approach in traditional education. In entrepreneurship as a method, a similar dualism can be found in that the scientific method focuses on the objective while the entrepreneurial method focuses on the intersubjective, i.e. the relational aspects between people (Sarasvathy and Venkataraman, 2011).

Content versus process

In the content versus process dualism the words used are indeed similar. According to Cunliffe (2011), the conception of time and progress differs between subjectivism and objectivism, being iterative in subjectivism and linear in objectivism. Jeffrey and Woods (1998) report about a product focus among Ofstede evaluators representing traditional education values, whereas teachers prefer a process focus, being more oriented towards progressive education values. Cotton (1991) states a similar dichotomy between focus on content in traditional education versus focus on process in entrepreneurial education. In entrepreneurship as a method the iterative learning techniques of effectuation are contrasted to the linear and static processes of causation (Sarasvathy, 2001).

Detached versus attached

This is an area of rather binary opposition. Science has traditionally put high value on the disinterested pursuit of truth, while more recent qualitative research methods focus more on the meaning-making activities of individuals (Cunliffe, 2011). Guba and Lincoln (1985) position positivist approaches as value-free inquiry, contrasting them to value-bound naturalistic approaches. In the domain of general and entrepreneurial education there is frequent emphasis on the importance of emotionally involved and active learners, which stands in contrast to the passive and detached learners they depict in traditional learning environments (Gibb, 1987, Tynjälä, 1999, Egan, 2008). Emotionality also plays an important role in effectuation. It is described as a process of searching for commitment rather than establishing contractual relations, which is done by leveraging on people’s docile and partly altruistic behavior in their search for meaningful activities (Sarasvathy and Dew, 2005).

Theory versus practice

The theory-practice gap is one of the truly classical dichotomies in our society. Lewin (1951) has stated that there is “nothing as practical as a good theory” (p.346), aimed as a scepticism towards measurement-based psychology research not taking theory enough into account. But the use of theory is very different in the fields of education, entrepreneurship and management compared to fields such as medicine and law (Nuthall, 2004, Khurana et al., 2004). One main issue is what view of knowledge is used, and in what fields we can even produce and publish relevant propositional “expert” knowledge at all (Kennedy, 1999). Some even state that being relevant to society is one of the main challenges to business schools or even to education in general (Binks et al., 2006, Pfeffer and Fong, 2002, Tushman et al., 2007, Tynjälä, 1999). Mandl et al. (1996) state that the inert knowledge taught at universities frequently cannot be transferred to the complex real-life problems prevalent in many ill-defined domains. Epistemologically these differing views on knowledge could be regarded as mirrored through the dichotomy between the positivist view that there is an objective reality and the interpretivist view that knowledge is constructed through lived experience (Weber, 2004). The centrality of lived experience is frequently discussed in the domain of entrepreneurial education. Ollila and Williams Middleton (2011) report from an experiential learning environment focusing on venture creation, where learning outcomes emerge from real experiences when learners co-create knowledge together with their educator. They contrast this to more conventional approaches where the emphasis is upon theory, content and expert knowledge transferred to passive learners. The discourse on entrepreneurship as a method also contrasts action and co-creation against universal theories, models and laws (Sarasvathy and Venkataraman, 2011), and it is further proposed that we introduce some playfulness into reasoning around theory versus practice by regarding experience as a theory, in a non-teleological manner, i.e. action without a final known cause (Sarasvathy and Dew, 2005).

Discussion

We have now constructed a framework containing a set of five dualisms that all seem to be distinctly present in one way or another in at least four quite different domains, possibly also present in more domains not covered in this paper. We will now consider some possibilities to balance and bridge between their outlier positions. Jarvis (2006) and Hager (2005) state that resolving dualisms such as mind/body, thought/emotion, theory/practice, are crucial to our understanding of human learning, so this endeavour seems worthwhile. Indeed, as Chen et al. (2010) state, “interaction between two forces of *yin* and *yang* would creatively evolve myriad objects and things.” (p.181). One could even argue that this kind of interaction is the primary task of universities, judging from educational philosopher Whitehead (1967):

The justification for a university is that it preserves the connection between knowledge and the zest of life, by uniting the young and the old in the imaginative consideration of learning. The university imparts information, but it imparts it imaginatively. At least, this is the function which it should perform for society. A university which fails in this respect has no reason for existence. (p. 97)

Using the developed framework we can now take our initial research question and operationalize it in each of the five identified dualisms. We then get five questions we really care about, and that all can help to balance between traditional and progressive education in various ways, provided that they can be answered constructively. They are:

How can entrepreneurship contribute with cognitive tools that...

1. ...simplify a complex, multidisciplinary and holistic constructivist learning environment?
2. ...preserve the concrete and individual aspects in a social learning environment?
3. ...inject more content and linearity into an iterative learning process?
4. ...facilitate detached reflection in an emotional and action-oriented learning environment?
5. ...absorb more theoretical knowledge into a practice-based experiential learning environment?

The main purpose of this paper is not to propose exhaustive answers to these questions, but rather to develop a framework where these questions can be put into perspective. We will now tentatively propose two cognitive tools with origin in the entrepreneurship domain that might have a potential to address these questions.

Proposed cognitive tool #1: Value creation

From the definition by Bruyat and Julien (2001) outlined previously we can regard the concept of creating value as a potential cognitive tool that can foster learning. The most obvious way that value creation fosters learning is by the way this specific definition of entrepreneurship states that the environment that is undergoing entrepreneurial change also changes the individual and causes learning. Alluding to John Dewey's famous notion of "Learning by Doing" we propose a similar pedagogic approach of "Learning by creating value", grounded in the field of entrepreneurship. This would then address question no 1 – "How can entrepreneurship contribute with cognitive tools that simplify a complex, multidisciplinary and holistic constructivist learning environment?" – in that it constitutes a simple yet powerful goal that complex constructivist learning environments can be organized around. It would also address question no 2 – "How can entrepreneurship contribute with cognitive tools that preserve the concrete and individual aspects in a social learning environment?" – in that it allows for an individually oriented and very concrete outcome of a social learning environment.

The domain of entrepreneurship also contains various frameworks for value creation that can be used to give answers to question no 3 above – "How can entrepreneurship contribute with cognitive tools that inject more content and linearity into an iterative learning process?" – making the iterative and complex process slightly more manageable by an educational institution and thus perhaps quasi-linear. One example is the Business Model Generation approach proposed by Osterwalder (2004), which has reached global usage and acclaim in a very short time due to its simplification potential. Another similarly widespread example relevant to question no 3 is the "Customer Development Process" proposed by Blank (2005) as a means to control the early product development phase of starting a company.

If we assume that success is not a prerequisite for learning, we can assume that failure to create value will yield equal amount of learning, or even more learning. This would then provide some answer to question 4 – "How can entrepreneurship contribute with cognitive tools that facilitate detached reflection in an emotional and action-oriented learning environment?" – in that both success and failure will trigger reflection. Regarding question no 5 – "How can entrepreneurship contribute with cognitive tools that absorb more theoretical knowledge into a practice-based experiential learning environment?" – we propose a starting point of the value creation process to be some knowledge domain or theoretical concept coupled with the question "For whom can this knowledge be valuable / rewarding?", and from that point initiate a process of value creation. This approach could then provide a balance between theory and practice.

From this analysis we can conclude that value creation as a cognitive tool could be quite a constructive means to balance between traditional and progressive education. Some previous research supports this. Surlemont (2007) reports from a research project in Belgium where pupils participated in experiential learning projects where they created value for people outside their class, such as younger pupils, parents, friends, tourists, companies, etc. When initial teacher scepticism had been overcome, many were stunned with the levels of enthusiasm and commitment shown by the pupils. This was mainly due to increased ability to make sense of their own learning, increased self-confidence among learners and a sense of pride due to external exposure.

Proposed cognitive tool #2: Entrepreneurship as a method

We will now explore viewing entrepreneurship as a method as a cognitive tool to foster learning in relation to the five questions outlined above. Regarding entrepreneurship as a method supposes effectuation to be a dominant logic (Sarasvathy and Venkataraman, 2011). Effectuation could be regarded as a teachable concept containing some relatively easy-to-grasp concepts such as “expanding cycle of resources”, “bird-in-the-hand principle” and a set of simple questions in the beginning of each iteration such as “Who am I?”, “What do I know?”, “Whom do I know?” and “What can I do?”. We will not go into details of these concepts as this has already been done by others (Read et al., 2011, Sarasvathy and Dew, 2005). But we will use some of these principles for our analysis.

Addressing question no 1 – “How can entrepreneurship contribute with cognitive tools that simplify a complex, multidisciplinary and holistic constructivist learning environment?” – we can see that the work of Sarasvathy and colleagues over the last decade has provided a framework that has the potential to greatly simplify complex constructivist learning environments. The now available teaching material based on this framework can be a good opportunity for teachers wanting to take advantage of this framework in their teaching (Read et al., 2011). Regarding question no 2 – “How can entrepreneurship contribute with cognitive tools that preserve the concrete and individual aspects in a social learning environment?” – we can see that the four basic questions outlined above constituting the starting point of each cycle in an iterative effectual process foster a concrete connection to the individual since they are so immediately focusing on the self. This holds potential to balance the sometimes vague progressive approaches with some solid individually focused questions.

Sarasvathy (2001) states that an effectual process should focus on “the controllable aspects of an unpredictable future” rather than to “focus on the predictable aspects” (p. 251). Applied to educational institutions it could be interpreted as a call to let go of the usual ambition to predict every step in the educational process, and instead embrace unexpected surprises. Although this might not be a straight answer to question no 3 – “How can entrepreneurship contribute with cognitive tools that inject more content and linearity into an iterative learning process?” – it indicates an attitude that could prove helpful to teachers in designing constructivist learning environments.

The “expanding cycle of resources” outlined by Sarasvathy and Dew (2005) always starts each iteration with self-oriented questions. If this recipe is followed in designed learning environments it could be said to promote repeated self-reflection, and thus address question no 4 – “How can entrepreneurship contribute with cognitive tools that facilitate detached reflection in an emotional and action-oriented learning environment?” – promoting some kind of structured and detached evaluation of oneself. Question no 5 – “How can entrepreneurship contribute with cognitive tools that absorb more theoretical knowledge into a practice-based experiential learning environment?” – is also answered by one of these questions, i.e. the

“What do I know?” question. This specific question could be connected to curriculum content, balancing between theory and practice in a relatively elegant way.

Also the notion of entrepreneurship as a method seems to be a powerful cognitive tool possible to integrate into formal learning environments with a multitude of benefits related to the traditional versus progressive education dichotomy.

Implications and conclusions

This paper was but an initial exploration into ways to balance between traditional and progressive education by considering cognitive tools from the entrepreneurial domains of theory and practice. It seems that this attempt to bridge between education and entrepreneurship has yielded many interesting implications for both research and for practice. For researchers this opens up for new opportunities to consider entrepreneurship theory and practice as pedagogical cognitive tools in general education. For practitioners this can serve as inspiration for trying out some of the vast array of tools, models and concepts in the entrepreneurship domain.

The conclusion of this analysis and the resulting framework and five questions is that both value creation and entrepreneurship as a method can be considered as cognitive tools that have potential to balance the dualisms between traditional and progressive education. It also seems that further inquiry into the entrepreneurship domain can surface more cognitive tools of potential use in general education environments. It however seems appropriate to note that use of entrepreneurship tools outside the domain of entrepreneurship often requires the use of a wide definition of entrepreneurship, and thus could require substantial rewording and translation from specific business language to more generic “enterprising individuals” based language.

Some limitations of this study have also been raised. Generalizing across disciplines in the way we have done in this article constitutes significant risks since concepts and theories developed in one domain not necessarily can be translated into other domains without severe translational problems. Nevertheless, it was noted how substantially disparate domains use very similar vocabulary and reasoning around core concepts covered in this article.

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