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Educating entrepreneurs in practical methods with design practices as a guide

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Abstract:
This paper argues for the incorporation of design principles into entrepreneurship education. The paper makes the case that design as a topic is analogous to entrepreneurship. The paper starts by discussing entrepreneurship as a topic and expanding on how traditional methods of teaching entrepreneurship are no longer appropriate. It then sets out to discuss the general underlying principles behind design methods. In the discussion the paper expands on how design based tools can be used to encourage students of entrepreneurship to find potential customer's needs, prototype businesses and evolve their thinking around potential opportunities. The article aims to build on a trend of incorporating design methods into entrepreneurship by adding to the discussion around methods that are appropriate for teaching entrepreneurship.

Keywords: entrepreneurship, design, design thinking, entrepreneurial practice

1 Introduction

The perceived importance of entrepreneurship is easy to observe with the increased academic attention it has received. Locally in Nordic countries the focus has been on supporting entrepreneurship as a vehicle for innovation. Growing economies and wealth creation are accepted as being one of entrepreneurship's defining objectives (Ireland, Kuratko, & Covin, 2003). Some even suggest that an entrepreneurial mind-set can be sufficient to support the growth of an entire economy (Ireland, Hitt, & Sirmon, 2003). It would seem reasonable then to focus on how best to train entrepreneurs in order to carry out this critical task. There is a wealth of research at the conceptual level of how best to do this, yet there appears to be an absence of papers suggesting concrete operational ways to do this. A few papers (Baron & Henry, 2010; Neck & Greene, 2011) come close to doing so, but seem to fall short of providing a concrete teaching methodology. The field of entrepreneurship has borrowed heavily from other theoretical areas such as economics, psychology and management (Kamovich & Longva, 2015). Yet this borrowing has not brought with it teaching methods from those fields. In

addition there is an absence of evidence as to whether current teaching methods are effective at producing new firms that thrive.

This paper proposes using design based methods for training aspiring entrepreneurs. In order to make the argument for why this is appropriate the paper initially discusses several schools of thought with regards to entrepreneurship education. These schools of thought are; the traditional approach to training entrepreneurs; followed by the cognitive perspective on entrepreneurship training; as well as the evolving field of design as a methodology for training entrepreneurs. The deceptively simple ambition of training entrepreneurs is fraught with ambiguities, unanswered questions and definitional traps. Entrepreneurship is complex, chaotic, and lacks any notion of linearity, yet educators often treat the subject this way (Neck & Greene, 2011). We argue the focus should instead be on developing the discovery, reasoning, and implementation skills of entrepreneurship students so they may excel. These skills enhance the likelihood that students will identify and capture the right opportunity at the right time for the right reason (Neck & Greene, 2011). This paper sets out a discussion for how design based concepts can be used for educating students in such skills.

2 What should aspiring entrepreneurs be taught?

In accepting that entrepreneurship is something that can be taught it raises an additional question. What should entrepreneurs be learning to do? Most entrepreneurship programmes seem to offer a mix of classes on opportunity evaluation, entrepreneurial marketing, entrepreneurial finance, and managing growth (Neck & Greene, 2011). Pittaway and Edwards (2012) found that most entrepreneurship education uses traditional pedagogic methods, and focusses on teaching "about" entrepreneurship. Instead of engaging students in entrepreneurship or having them participate in entrepreneurship. The number one form of assessment in entrepreneurship courses is still business plans (Pittaway & Edwards, 2012). This is despite no evidence being found than business plans improve the likeliness of survival or improve profitability of new firms (Honig & Karlsson, 2004). Business planning has been found to slow or hinder the venture creation process, and fails to lead to improved growth rates of firms once established (Capelleras & Greene, 2008). This points to a serious need to reconsider the way that entrepreneurship is taught.

There is an institutional reason for why entrepreneurship is currently taught the way it is (Honig & Karlsson, 2004) and the reason is that entrepreneurship is often thought of as a process—a process of identifying an opportunity, understanding resource requirements, acquiring resources, planning, and implementing. While Kickul, Gundry, Barbosa, and Whitcanack (2009) set out four distinct stages of the venture creation process: (1) the searching stage, (2) the planning stage, (3) the marshalling stage, and (4) the implementing stage. This assumes a linear type approach, where individual steps can be defined, and a process followed. However, the word "process" assumes known inputs and known outputs as in a manufacturing process (Neck & Greene, 2011). The problem is that entrepreneurship is neither linear nor predictable, but it is easy to teach as if it were (Neck & Greene, 2011).

There has been an acknowledgement within academic circles that entrepreneurship is not just a process, and that there are human actors involved. Krueger (2007) argues that we need to look at the underlying cognition or way entrepreneurs think in order to separate those who 'do' from those who 'don't', and to therefore teach that mind-set to students. The cognition camp focusses on the entrepreneurial mind-set defined as a growth oriented perspective through which individuals promote flexibility, creativity, continuous innovation, and renewal (Ireland, Hitt, et al., 2003). This mind-set means that even under conditions of uncertainty, the entrepreneurially

minded can identify and exploit new opportunities because they have cognitive abilities that allow them to impart meaning to ambiguous and fragmented situations (Alvarez & Barney, 2002). Entrepreneurial mind-set is; recognizing entrepreneurial opportunities, entrepreneurial alertness, real options logic, entrepreneurial framework, and opportunity register (Ireland, Hitt, et al., 2003). How to teach such a mind-set, and demonstrable examples of this are absent from academic literature. In addition, the cognition world brings us back to the question of who is the entrepreneur? And how do we separate successful entrepreneurs from those who are not (Neck & Greene, 2011)?

A quick recap of the points covered to here will show a diverse and fractured theoretical perspective on entrepreneurship that ranges from a linear practice to a general mind-set. None of these schools of thought bring us closer to defining what actually it is that an entrepreneur does, and therefore what to teach nascent entrepreneurs. This may be because the difference between entrepreneurs is as great as the difference between entrepreneurs and non-entrepreneurs (Gartner, 1985). If we are unable to define what entrepreneurship is either as an activity or a mind-set, then it would appear to be an impasse. However this ambiguity is part of what defines entrepreneurship. It is a subject beset with uncertainty and variation. The same ambiguity has not seemed to plague other subjects to the same extent. Definitional issues has not hindered the free expression of dance, or its teaching within higher education institutions. To draw on United States Supreme Court Justice Potter Stewart's ruling on the difference between art and pornography, he states it best when saying 'I may not be able to define it, but I know it when I see it'. In the same way we might not be able to exactly state what entrepreneurship is as a method or process or even a way of thinking, however we know entrepreneurship when we see it. The reality is entrepreneurship is unclear, and indirect. As Hoholm and Araujo (2011) state, the path to an innovation often appears clear when reflecting back on the path chosen, however when walking the path it is far from clear.

3 Design as a thought process

One particular school of thought that appears comfortable with ambiguity and uncertainty is design (Nielsen & Stovang, 2015). Design is a process of divergence and convergence requiring skills in observation, synthesis, searching and generating alternatives, critical thinking, feedback, visual representation, creativity, problem-solving, and value creation (Beckman & Barry, 2007). Teaching entrepreneurship through a design lens can help students identify and act on unique venture opportunities using a toolkit of observation, fieldwork, and understanding value creation across multiple stakeholder groups (Neck & Greene, 2011). The basic tenet is that entrepreneurs think, and perhaps act, similar to designers. In our quest to define, understand, and teach entrepreneurship, the world of design is a good starting point for our inquiry. Entrepreneurship is an applied discipline, yet we are teaching and researching as if it was part of the natural sciences; yet we would be better served if we were to use design based curricula (Simon, 1996).

By the very nature of their activities, entrepreneurs often find themselves in situations that are new, unpredictable, complex, and likely to produce information overload in many different ways (Baron, 1998). As such entrepreneurship education should make use of a principles based approach associated with design instead of rigid theories or linear processes (Sarasthvathy, 2008). Design thinking offers a breakout from the previous linear problem solving techniques associated with entrepreneurship education. Design thinking is specifically suited to handing uncertainty, and is noted as a method suitable for dealing with ambiguity and uncertainty (Dunne & Martin, 2006). One of its major differences is its epistemological starting point. Design thinking includes inductive, deductive, and abductive reasoning. In Aristotelian logic,

inductive reasoning is generalization from specific instances, while deductive reasoning involves inference from logical premises. Peirce and Turrisi (1997) describes abductive logic as "the process of forming an explanatory hypothesis. It is the only logical operation which introduces any new idea."

Design thinking, therefore, combines the generation of new ideas with their analysis and an evaluation of how they apply generally. A designer uses abduction to generate an idea or a number of ideas, deduction to follow these ideas to their logical consequences and predict their outcomes, testing of the ideas in practice, and induction to generalize from the results (Dunne & Martin, 2006). Design thinking is said to have both analytic and synthetic elements. In addition it operates in both the practical and theoretical realm. The process moves between the concrete and the abstract worlds, and it alternately uses analysis and synthesis to generate new products, services, business models, and other designs (Beckman & Barry, 2007). While the process may appear linear, it is an iterative process that can start in any place, move in any direction and can jump between steps.

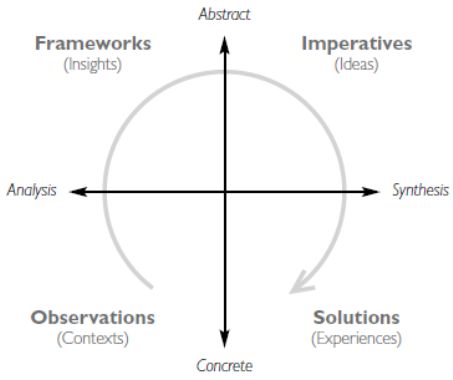

Figure 1. The design thinking innovation process is mapped on two axis – concrete/abstract; and analysis/synthesis (Beckman & Barry, 2007).

Starting with observations the design thinking process aims to gain a deep understanding of the context. Armed with the data generated from observations, the next step is to make sense of the data. This involves framing and reframing to identify patterns and insights. Staying in the abstract realm, the next step is the generation of ideas. This involves the creation of value propositions. The innovation process then returns to the concrete realm to provide solutions. As the process is iterative the process continues the cycle, testing these solutions in context, gaining further observations, that will form the basis of later insights, and so the cycle continues. While described as a linear process here, there is no "correct" order in which to carry out the steps. The important thing is to ensure that all the steps are moved through at one point (Beckman & Barry, 2007). Design thinking involves epistemological pluralism and consciousness of the system wide consequences of decisions (Dunne & Martin, 2006). The idea of applying design approaches to solve business problems is relatively new and, as yet, largely underdeveloped in academic literature and within business schools (Dunne & Martin, 2006).

Utilising a design thinking perspective doesn't preclude the already discussed schools of thought regarding entrepreneurship, but rather builds on their perspectives. It is entirely consistent with the cognitive perspective where entrepreneurial learning theory presents entrepreneurship as a contextual process of becoming, where the entrepreneur is continually learning and developing in relation to his or her business and the wider environment (Cope,

2005). Accepting that design methods can play a useful role in educating entrepreneurs the next sections set out to discuss how this can be done in practice.

4 Discussion on incorporating design into teaching entrepreneurship

As mentioned previously, the design thinking process is not linear, like anything though you need to start somewhere. The same could be said of entrepreneurship, that there is no defined starting point. Using a design process to guide the entrepreneurial process results in four broad stages: (1) understanding the context in which the entrepreneur(s) will operate; (2) clarifying data and insight identification about potential issues or problems within the context; (3) generating solutions that fit to both the context and the insights; (4) prototyping these solutions, and prototyping the business itself. These four stages mimic the diagram set out in *figure 1*. In each of the below sub sections we discuss the practical steps involved in carrying out these four stages as well as discussing the learning we speculate occurs.

4.1.1 Observation and data collection

Starting with observation as a form of data collection, requires students to make use of several types of tools. This includes passive observation of their context of interest. They are encouraged to undertake open ended interviews. Where possible, students are encouraged to immerse themselves in their environment. The whole methodology sits very closely to modern day anthropology, although actual anthropologists might be uncomfortable with design thinking borrowing this term. In traditional design thinking this stage is called gaining empathy (Brown, 2009).

This stage is often reported as being uncomfortable for students due to the ambiguity that is present in not knowing what answer they are searching for. The goal as Krueger (2007) suggests is to move students from answer-finding to question-creating, to take personal (cognitive) ownership of their projects. This sense of discomfort that students experience in not knowing what "answer" they are searching for often generates what Erikson (1980) labels as "crises". As we move through stages in life we likely experience crises, we can only move on if we work through the "crisises" (Erikson, 1980). Erikson and others show developmental experiences need not be as profound as religious conversion or a midlife crisis when considered in light of the constructivist learning model—which asserts that developmental experiences are absolutely central to how humans really learn, as they serve to change how we structure our knowledge (Krueger, 2007). This sense of uncertainty that students experience is sufficient to provide a mini-crises, and forces students to move from answer-finding to question-creating, and leads to them taking greater personal ownership of their projects. In addition it moves them from

4.1.2 Data clarification and insight identification

Moving on from observation to insights requires students to make sense of their world, to make judgements about what people find important. In transitioning from observing to insights requires the collation and organization of all the data they have gained during the observation stage. It is this process of moving the information from a chaotic state to an organized state that also helps them to organize their own thoughts and insights. Students are encouraged to visually map out their interviews, to colour code repeating pieces of data, to use post it notes to summarise interviews, and then rearrange these post its into consistent themes from various interviews. Again this often represents a departure from typical business school learning, and information management. Students are used to word documents and spreadsheets. This move to a more visual representation also supports a greater freedom in thinking. Entrepreneurs tend to use heuristic-based methods rather than systematic processing to accomplish similar tasks (Mitchell et al., 2007). Heuristics however take practice to develop. Using these visualisation

processes helps provide a structure for students who might otherwise be overwhelmed by the quantity of conflicting data.

Students are forced to make judgements to as to which insights are most critical, and to use these for the next step when generating ideas. Judgement refers to decision making under conditions of uncertainty, with incomplete information where there is a range of possible outcomes, and the likelihood of specific outcomes is unknown (Foss, Foss, Klein, & Klein, 2007). The critical element is that it there is no "correct" answer, and is often a shift in mind-set for students who are more used to teachers knowing and having the "correct" answer to problems. While entrepreneurs demonstrate an instinctive ability to spot opportunities and make judgements (Ardichvili, Cardozo, & Ray, 2003), this may just be a case of practice (Baron & Henry, 2010). It is unreasonable to expect students to be able to recognise opportunities instinctively, which is why a more structured approach is suggested here. This step is often carried out in tandem with observation and data collection, and can be used as a form of guidance as to where to concentrate student's efforts with regards to data collection.

4.1.3 Idea generation

The next step focusses on idea generation. It is intimately linked to the previous step of making sense of the data. The insights gathered often are phrased as problems or themes that potential customers find important. These problems are used as the inspiration for idea generation. We encourage students to use traditional idea generation methods here, such as brainstorming. However, this can be described as brain storming with a twist. The students need to take into consideration the perspectives of various interest groups when generating ideas. In generating ideas they need to take into account three distinct perspectives; customers wants; what is financially viable; and finally what are the students capable of executing on (Brown, 2009). The students are then encouraged after the brain storming session to filter out those ideas that fail one of the criteria, or to alter the idea to better fit these perspectives. Rae (2004) argues that through practice entrepreneurs develop a theory of "what works". As students are new to entrepreneurship, they lack this instinctive filtering mechanism. The next step is designed to give student experience in what works and what does not work.

4.1.4 Prototyping

Following their idea generation session student teams musts select an idea to pursue further. The settling on a decision is of itself often a learning opportunity for students who must overcome discussions within the group around making judgements as to what forms a "good" idea. Having settled on an idea, the students are then encouraged to produce concrete versions of their proposed solutions in the form of prototypes. The concept of prototypes are well known within design, however in entrepreneurship they have a lesser known history. Although there has been a move towards prototyping businesses with the popularisation of lean methodologies (Ries, 2011) and Value Proposition Design approaches (Osterwalder, Pigneur, Bernarda, & Smith, 2015). The idea is to de-risk launching a new business (Ogilvie & Liedtka, 2011). The students are encouraged to think of their solutions not just in terms of products or services, but rather far more holistically in the form of business models. While the process set out by Osterwalder et al. (2015) is useful from a theory point of view, an over attention to it tends to be a distraction for students. Close adherence to the book can lead to students not leaving the classroom and failing to test their ideas. Even though they may have a clearer understanding of theory. We suggest therefore leaving students "blind" to some theory, and allowing them to experience uncertainty and ambiguity as suggested in Kamovich & Longva (2015), and encouraging them to prototype their businesses.

While we emphasise a strong focus on doing, there is still theory underlying this. It is not doing just for the sake of doing, but with a clear purpose. Entrepreneurs are often blinded by their own enthusiasm regarding what they think is a good idea. They should therefore launch their businesses as quickly as possible, releasing the idea into the real world to gauge the response it receives. This idea is reiterated in design literature, that ideas should be tested in the real world, and that their true value cannot be established purely by thinking about an idea or writing a business plan about it (Ogilvie & Liedtka, 2011; Osterwalder et al., 2015; Sims, 2013). The inability to know beforehand the outcome of a new project is discussed in Gerstenberg, Sjöman, Reime, Abrahamsson, and Steinert (2015). They state that the only way to discover how an innovation will behave is to test it in the real world, as there is no way of knowing the unknown in advance and that analysis of an innovative business idea is a fictional exercise based on assumptions. Therefore releasing prototypes and learning along the way represents an effective and affordable away to test new ideas (Steinert & Leifer, 2012).

Having launched a business once, the theory goes that launching another business in the future will be less daunting (Baron & Henry, 2010). Although the evidence is mixed as to whether prior start-up experience is an advantage (Alsos & Kolvereid, 1998; Honig & Karlsson, 2004). Although it can be argued that students testing their idea in the real world and launching a business can be considered practice (Baron & Henry, 2010). Practice plays an integral part in shaping knowledge structures. Having launched a business students are then encouraged to keep working through the various steps from observation of how their business is received; through to gaining insights about why the business is successful or not; through to creating ideas; and implementing new solutions.

4.1.5 Learning as part of the process

The entire process is carried out in teams and focusses on learning within a group structure. This is consistent with Burgoyne (1995) who redefines Kolb's experiential learning model (Kolb, 1984) from a relational perspective. His core argument is that the nature of learning from experience is not one that takes place in isolation but is something that takes place within a social context and is therefore influenced and affected by those with whom the learning takes place, and that learning is therefore a social experience. For Burgoyne, a collaborative meeting of minds is critical to the creation of both individual and collective learning. While entrepreneurship has focussed predominantly at the individual level, the reality is that entrepreneurs rarely achieve success alone. We therefore consider it important that learning should be something that takes place collectively within a group.

Reflection in addition is vital for developing knowledge from experience and is, according to Neck and Greene (2011), especially important when facing perplexing experiences, conditions of high uncertainty and problem-solving. Reflecting upon experiences should enable what Marton and Säljö (1976) characterize as deep-level processing where students gain insight by relating previous knowledge to new knowledge. They claim that when students engage in deep learning, they go beyond merely memorizing and reproducing information for assessments. Instead students will aim to make sense and thoroughly understand the subject matter and how theoretical perspectives relates to each other as well as to the real world (Kamovich & Longva, 2015).

5 Further research and limitations

This teaching method of incorporating experiential learning using design is relatively new to the academic field of entrepreneurship, as such there has been a lack of discussion about how to apply the design perspective in an operative way. The other consequence is there is little

evidence other than anecdotal as to whether these methods in fact work. One of the difficulties in measuring effectiveness is in selecting which outcomes to measure. Kamovich & Longva (2015) gathered evidence supporting the assertion that students felt they were learning and could see the real world use of such an approach, and that they enjoyed being taught in this manner. As Baron and Henry (2010) point out, practice should not necessarily be fun. Establishing that students could see the use of the method is not the same as establishing whether deep learning has actually occurred. In addition there is no data on whether such methodology creates additional start-ups or instances of entrepreneurship. Students do not always come as far as launching their business, many often getting stuck along the way. Research into how to help students move past the mental barriers they encounter would be a fruitful field for further research. Finally, where those instances of start-ups were to occur, there is little to no discussion as to whether this is in fact a positive for the economy, or whether these students would have generated more value for the economy had they followed more traditional career paths. Finally, as Neck and Greene (2011) discuss, assuming that economic value is the only measure of success for entrepreneurs does not take into account that most entrepreneurs are motivated by factors other than financial rewards. We acknowledge that the teaching methodology described here is not supported by data demonstrating its effectiveness, this can form the basis of ongoing research.

6 Conclusion

We have set out a discussion on how design principles can be incorporated into teaching entrepreneurs. The suggested teaching method has a strong emphasis on using design based skills to carrying out activities around identifying opportunities, and launching prototypes of their businesses to test the quality of their ideas. The process is iterative, and the learning continues throughout the process. While the process has been described in a linear step-wise process, the reality is often that students move back and forth between the steps. This becomes especially so when they become adept at understanding how to use design skills.

While the methodology focusses on doing, it does so with an underlying purpose. It provides students with a taste of the uncertainty and ambiguity that entrepreneurs face on a daily basis. As individuals approach the possibility of becoming entrepreneurs and think about the different skills required to create a new venture, their mind-set may foster some self-perceptions and inhibit others, enhancing different types of self-efficacy (Kickul et al., 2009). The purpose of engaging in the entrepreneurial process described here is to challenge some of these perceptions, and to reduce the mental barriers that may exist in student's minds. In seeing that they are capable of launching a business, and that doing so is often challenging and rewarding, they may be forced to re-asses some of those mental schemas and adopt beliefs that are closer to reality. In this way the design methods can be used to bring about what is recognised within entrepreneurship literature as a key component of becoming an entrepreneur, which is cultivating an entrepreneurial mind-set.

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