SWEDISH ECONOMIC FORUM REPORT 2019

ENTREPRENÖRSKAPS-UTBILDNING

GÅR DET ATT LÄRA UT ENTREPRENÖRSKAP?

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ENTREPRENÖRSKAPS FORUM

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KAPITEL 2

EDUCATION AND ENTREPRENEURSHIP

SARAS D. SARASVATHY

1. INTRODUCTION

When creating educational programs in entrepreneurship or more broadly enacting entrepreneurship education policy, we should consider an overarching framework choice: Do we want to think about entrepreneurship as an outcome of curriculum and policy, or do we want to think of it as a method *a la* the scientific method? There are good reasons to teach science to everyone, not only to potential scientists. This report will argue that there are even better reasons to teach entrepreneurship to everyone. Yet most current policy frameworks have approached entrepreneurship education with the former mindset. And that has led to definitions of outcomes in terms of unicorns[1] and gazelles[2], or in terms of intentions to start new ventures, rather than in terms of an entire populace capable of using the entrepreneurial method. Consider this in juxtaposition to the scientific method. If we evaluate science education in terms of the choice to become a scientist or worse still, in terms of actual inventions created, we would be missing the point of scientific education.

Framing entrepreneurship as a method enables anyone and everyone in society to use it to cocreate a variety of outcomes that we cannot even dream of today. This also leads us to tackle curriculum development in more philosophical and historical depth than assembling an ad-hoc set of tools from popular best sellers claiming to benchmark Silicon Valley or Israel or some other hotspot of the moment. Instead a method mindset leads us to build on actual lessons from the lived experiences of

1. In Silicon Valley and more broadly in the domain of venture finance, the word "unicorn" means a company valued at over $1 billion.
2. Investopedia defines a gazelle as a young fast-growing enterprise with base revenues of at least $1 million and four years of sustained revenue growth.

entrepreneurs around the world and through history. These lessons contain techniques for tackling not only today's problems, but also tomorrow's uncertainties.

That is exactly how a number of scholars and educators have set out to construct the entrepreneurial method, the cornerstone of which has come to be known as effectuation.

Over the past two decades, effectuation has been developed as the most research-driven rigorous framework for the study and teaching of entrepreneurship in universities around the world. Over 700 peer-reviewed articles have been published, including about 100 in top tier journals. About a dozen books have developed a variety of teaching and practical applications ranging from training refugees to corporate managers and even a language-neutral curriculum to train illiterate people living in remote parts of developing economies. Although much work remains to be done, this chapter traces developments till date and organizes them into a concise summary in terms of the content, antecedents, and outcomes of effectual entrepreneurship as a foundation for the formulation of education and policy. The chapter will also show why we need to teach entrepreneurship as a method, and how and why framing entrepreneurship as a method can enable both economic and social developments of considerable scale and scope evocative, if not exceeding that of science in the past three centuries of human history.

2. EFFECTUAL ENTREPRENEURSHIP: A BRIEF HISTORY OF RESEARCH AND TEACHING

Put simply, science is a method of predictive control. Science seeks to discover invariant laws governing our universe that can allow us to control our futures in it through better predictions about nature, including human nature. Science is extremely useful in showing us new ways to achieve our ends. Entrepreneurship is a method of nonpredictive control. It builds on science, but is not the same as science. Instead effectual entrepreneurship seeks to cocreate new futures, including new ends worth achieving, even in the face of multiple uncertainties and a variety of resource constraints. As a cornerstone of the entrepreneurial method, effectuation can be taught to anyone and everyone at all ages and stages of life.

Effectuation was discovered through a study of expert entrepreneurs in 1997-98 (Sarasvathy, 2009). The study used a very well-established method called *Think-aloud Protocol Analysis* from cognitive science (Ericsson and Simon, 1984). This method had been developed by the Carnegie school to study about 200 domains of expertise, but had till then not been used to study expert entrepreneurs. The standard definition of an "expert" in cognitive science includes at least ten years or more full-time immersive experience within the domain of expertise combined with

evidence of proven performance. In other words, neither experience nor success by itself would be sufficient for the development of expertise. Experience is necessary but insufficient for expertise. And success can occur due to many other reasons than expertise. Hence, building an education program leading to the development of expertise requires a definition of expertise that goes beyond mere experience or success.

Based on this definition, an expert entrepreneur was defined as someone with ten or more years of full-time immersive experience in starting and running multiple companies including successes and failures and at least one public company. The last criterion not only offered evidence of proven performance but also enabled access to reliable data on that performance. Only 245 people qualified as expert entrepreneurs based on these criteria. All 245 were contacted and 45 agreed to participate in the study. A 17-page problem set of ten typical decision problems in entrepreneurship was constructed and pilot tested for the study. All participants were asked to think aloud continuously as they worked their way through this problem set. The think-aloud protocols were recorded, transcribed and analyzed to extract five principles that became the basis for the growing literature stream on effectuation. The next section of this chapter describes each of these in detail.

The original protocol instrument used to study expert entrepreneurs was then used in studies comparing expert entrepreneurs with novices, expert corporate managers and a variety of case studies of ventures from 51 countries in multiple domains and historical epochs. Additionally, several survey instruments and other methods were used to show the existence and use of effectual heuristics in subjects such as R&D managers and micro-entrepreneurs as well as in settings such as social media and international marketing. One early and important study of the history of RFID (Radio Frequency Identity) technology (Dew, 2003) combined the five principles of effectuation into a dynamic model as laid out in Figure 1 (Sarasvathy and Dew, 2005) and explained in detail in the next section of this chapter. Subsequent research delved in depth into this dynamic model and through a variety of conceptual and empirical studies, has refined and modified it in important ways. The academic research on effectuation seeking to spell out overlaps and contrasts with other theories in entrepreneurship, management, psychology, ethics and economics is continuing to progress in interesting and unexpected ways.[3] Much work has been done. And much more needs to be done. However, in parallel with these scholarly enterprises, a more practical stream began to feed into training and teaching programs in various settings in over 50 countries. Based on work done so far, we can now summarize the core content of effectuation as follows.

3. See a recent special issue of Small Business Economics Journal for a comprehensive review (Alsos, Clausen, Mauer, Read, and Sarasvathy, 2019).

3. EFFECTUATION AS CORE CONTENT OF ENTREPRENEURSHIP EDUCATION

Standard models of entrepreneurship often assume that the process begins with a novel idea that solves a problem or fulfills needs in an existing market. Hence, the logical steps in building a venture involve doing some kind of market research where entrepreneurs talk to potential customers, with or without prototypes, seeking to build value propositions that result in product-market fit. They can then take this "proof of concept" to investors, with or without a business plan, to garner resources to build a venture based on the business model they have designed. Even academic theories have posited that entrepreneurs have to identify or imagine new opportunities as a precursor to founding a venture.

Interestingly, expert entrepreneurs do not always start with innovative ideas or new opportunities. History provides many examples of successful ventures that start out with mundane, undifferentiated, often imitative ideas. Expert entrepreneurs simply start with things they know how to do that they believe might be of interest to particular people who might be willing to join them in building something of value in the world. Sometimes this ambiguity goes even further. They may not have an idea at all at the beginning of the process. And even more intriguingly, some of them did not even want to become an entrepreneur or start a venture. The five principles of effectuation discovered through studies of entrepreneurial expertise show us how to build enduring and innovative ventures with or without preconceived new ideas or opportunities.

3.1 Five Principles of Effectuation

1. Bird-in-hand:
Expert entrepreneurs begin with who they are, what they know and whom they know. Based on these means which are already within their control, they come up with a product or service or a solution to a problem they think is worth acting on for a variety of reasons. These reasons may or may not involve starting a venture or making money or any other obvious metric used in entrepreneurship research or policy. For example, Airbnb (called AirBed&Breakfast at the time) started with Brian Chesky and Joe Gebbia finding themselves unable to pay rent for their apartment in San Francisco. So they put an air mattress in their spare bedroom and offered to rent it using hot cereal in the morning as a way to attract renters. With the bird-in-hand principle, entrepreneurs are neither required to come up with a new idea nor begin with a clear opportunity or vision for a venture. What is required is to do what is doable, given who they are, what they know, and whom they now – means already within their control. The focus is on what you can do given your means, rather than what you should do given preset goals or opportunities.

2. Affordable Loss:
In doing what they can do with their current means, expert entrepreneurs do not invest anything more than they can afford to lose. In fact, they tend to figure out creative ways to get to market with as close to zero resources as possible. In other words, the idea they choose to act on is not necessarily the one with the highest expected or predicted return. Rather it is the one that is worth doing even if it does not work out in terms of standard metrics such as ROI. This principle obviates the need to predict what the upside will be and focuses attention instead on keeping the downside within the entrepreneurs' control. In the case of Airbnb, Chesky and Gebbia did not seek to raise money to purchase apartments or build hotels. Instead their initial growth strategy consisted in signing up friends and family to rent spare bedrooms just as they themselves had done.

3. Crazy Quilt:
One of the most important ways to keep the downside within one's control while pushing the upside higher is to bring on additional stakeholders, each of whom adds their birds-in-hand to the venture while investing no more than they can each afford to lose. Notice that in the Airbnb case, each additional bedroom has to come from others who are willing to self-select into an early stage venture that may or may not turn out to be successful. It is not the promise of high expected return that is at work here. It is the combination of bird-in-hand and affordable loss for each self-selected stakeholder. The crazy quilt principle is the engine driving the dynamics of the effectual entrepreneurial process. We will see that in greater detail below when we delve deeper into Figure 1. For now, the point of note is that effectual entrepreneurs cannot always predict who will become their stakeholders. But they don't need to, so long as they can figure out ways to work with those who are willing to actually put down a stake without promises of huge returns.

4. Lemonade:
The effectual process not only minimizes the need to predict the future, it allows unpredictability itself to become a resource. Expert entrepreneurs make lemonade out of lemons that life throws at them. For example, when growth was slow and money was scarce in the early stages of the venture, Chesky and Gebbia sold cereal at the Democratic National Convention in Denver. Relabeling Cheerios as Obama O's and Cap'n Crunch as Captain McCain Crunch allowed them to sell cereal at about $40 per box for a total of $30,000. In other words, the venture's seed stage funding came straight out of the lemonade principle. Additionally, the founders leveraged the free PR this generated into a seat at YCombinator.[4] YCombinator induced them

4. YCombinator is an accelerator program that invests small amounts of money in a large number of ventures. It has supported over 2,000 companies since its founding in 2005. https://www.ycombinator.com

to change the name of the company from AirBed&Breakfast to Airbnb and also opened doors to Sequoia[5] to fund them.

5. Pilot-in-the-plane:
At the heart of the logic of effectuation is the understanding that history does not run on auto-pilot. What entrepreneurs and their self-selected stakeholders DO matters. In fact, futures can be shaped, influenced and co-created by relatively small groups of people acting effectually in the face of multiple uncertainties and even ambiguities about their own goals. Markets too are not "out there" to be discovered and fitted or adapted to. Markets are to a large degree, if not entirely, created through human action. Chesky and Gebbia learned this the hard way, just as expert entrepreneurs do. After securing funding from Sequoia and finding no traction in building the business using standard techniques of product-market fit, they got on a plane to New York City to knock on doors, apartment by apartment, to sign on rooms for their venture. Through painstaking expenditure of shoe leather and sweat equity, they constructed the supply side of their platform business. But the demand side too had to be constructed. They learned that the quality of photographs was crucial to the actual renting of the rooms on their site. This meant getting professional photographers on board, which in turn meant a layout of cash they did not have. Using bird-in-hand and lemonade again, they built a photography platform that became an online marketing channel for photographers, who then returned the favor by taking pictures of rooms for Airbnb. The gap between a business model in theory and one in reality involved cocreation with people who had no direct stake in the business.

3.2 The Effectual Cycle: Dynamics of the Effectual Entrepreneurial Process

Figure 1 graphically illustrates how the five principles iteratively work together over time to produce innovative new ventures and enable the cocreation of new markets and new futures. A few things to note in addition to the five principles explained above include:

- The process is iterative and reflexive. That means it can start with any of the principles at any point in the process. Moreover, the principles can be used several times in the process and mixed and matched in a variety of ways as well.

- Innovation is an outcome of the process and need not be an antecedent to it. Note that new ventures/opportunities/markets and even new futures that no particular entrepreneur or stakeholder foresaw can arise through the process itself.

5. Sequoia Capital is a venture capital firm located in Silicon Valley. The companies it has funded have created over $1.4 Trillion in market value. https://www.sequoiacap.com

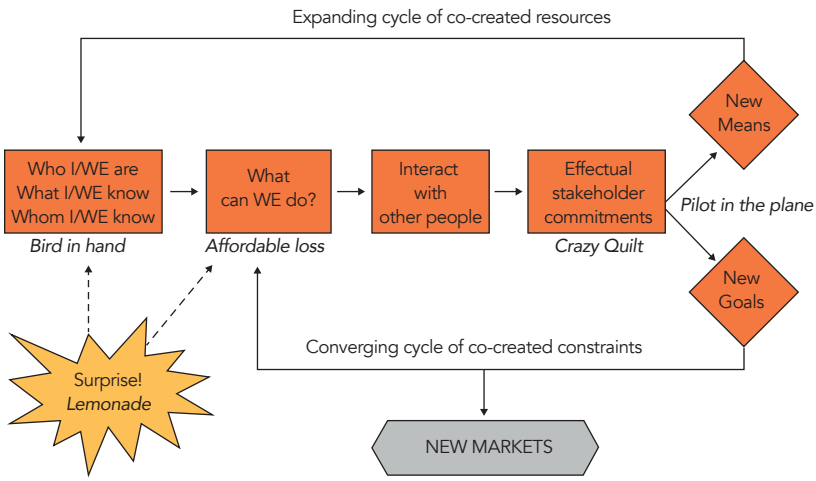
This offers two implications for performance:

1. Should success occur, outcomes of the effectual process are likely to be novel. In other words, effectuation increases the probability of innovation.

2. Should failure occur, it is likely to occur earlier and be spread over several stakeholders, each of whom invested no more than s/he could afford to lose. In other words, effectuation decreases the costs of failure.

Together, these two implications suggest that, irrespective of the failure rate of firms, entrepreneurs can increase their chances of success as *entrepreneurs* by starting more than one venture. In other words, we need to distinguish between the success/failure rates of firms from the success/failure rates of entrepreneurs (Sarasvathy, Menon, and Kuechle, 2013).[6]

FIGURE 1: Dynamics of the Effectual Process



Source: Sarasvathy and Dew, 2005.

3.3 Overall Logic of Effectuation: Nonpredictive Control

In his seminal thesis in 1921, economist Frank Knight made a case for profit as a return to entrepreneurship as uncertainty bearing (Knight, 2012[1921]). This later led to the identification of entrepreneurship as a fourth factor of production (in

6. In a recent study of all restarts from Denmark, Nielsen and Sarasvathy (2016) found errors in who *should* restart a venture after a failure but does not, and who *should not*, but does. In other words, they showed the existence of a market for lemons in entrepreneurship.

addition to land, labor and capital) in economics textbooks. Knight first distinguished risk from uncertainty. Risk consists of problems where the distribution is known but any given draw within the distribution is unknown. Uncertainty is harder since it involves problems in which both the distribution and the draw are unknown. A simple example can clarify the difference. Consider a game where you draw different colored balls from an opaque urn. To win you need to draw a green ball. In the first case of risk, you know there are 10 green balls and 10 red balls in the urn so you can calculate that the odds of your winning are 50-50. If you play the game over time, as you continue to draw balls, you can recalculate the odds and so place calculated bets. In the second case of uncertainty, you do not know how many balls of which color are in the urn. Before beginning to calculate odds here you need to do a series of trials that allow you to estimate the distribution. In some cases, the trial phase can last a very long time and be very costly. Knight then went on to describe a third type of uncertainty which we now call "true" uncertainty, where the distribution is not merely unknown, it is unknowable. This would be like an urn in which there are all kinds of things, not only balls. So even after a series of trials, you cannot build a picture of the distribution because every draw brings up a new object. In other words, prediction is literally impossible in the face of true Knightian uncertainty. That is why society needs entrepreneurs, people who act in the face of this true uncertainty.

By making predictive strategies unnecessary, effectuation provides a toolbox for tackling true Knightian uncertainty. In comparison with the scientific method that is built on a logic of predictive control exemplified by experimentation, the entrepreneurial method embodies a logic of nonpredictive control. This makes effectuation the cornerstone of the entrepreneurial method. Furthermore, because these two methods offer two different toolboxes, as a society, we need to educate people on both the scientific as well as the entrepreneurial method.

4. ANTECEDENTS OF EFFECTUATION: SUFFICIENCY, NOT NECESSITY

One intriguing question that the above exposition on effectuation raises is: *What are the antecedents of effectuation?* We already saw that effectuators need not begin with a novel idea or a preconceived new opportunity. But do they need certain personality traits or resources? Is effectuation likely to work better in certain contexts than in others?

Large quantitative studies as well as in-depth case studies from a variety of sociopolitical and historical contexts attest to the idea that no particular set of traits or resources are necessary conditions for effectuation. Traits of effectual entrepreneurs span a variety of values for psychological variables such as risk propensity, optimism, extraversion etc. Effectual entrepreneurs also come from a wide variety of

circumstances such as rich and poor, educated and illiterate, old and young etc. A reexamination of Figure 1 offers a glimpse of why and how this is possible. First, effectuators can begin with whoever they are, whatever they know and whomever they know. Since even the poorest and most disadvantaged of human beings is likely born into a community with at least minimal survival skills, every single person can kickstart the effectual process. Second, there can be as many possible ventures as there are people on earth. Hence persons with differing traits and circumstances can cocreate different kinds of ventures and futures. In other words, the outputs of successful entrepreneurship may be as varied as the inputs. Third, as we will see in more detail below, effectual entrepreneurship is not limited to unicorns and gazelles. In addition to those, it can also construct the backbone of the economy and society, ordinary ventures that sustain ordinary life in ordinary communities through reasonable periods of human lives and careers.

Whereas no particular psychographic or demographic variables are necessary for effectuation to occur, the issue of which particular socio-political conditions may be enablers or barriers to effectual entrepreneurship is a bit more complicated. It is easy to see that severely repressive regimes that offer no freedom of action or association can indeed stifle effectual entrepreneurship, just as they can stifle almost any human activity worth pursuing. Yet effectuation can serve as a toolbox for circumventing, and in many cases, fighting and overcoming even the most inhospitable of circumstances. One source of evidence for the continuing progress of ordinary human beings even in the face of widely varying regimes is Hans Rosling's dynamic bubble graphs on life expectancy and per capita income (Rosling, 2018).[7] Effectual entrepreneurial action can be a useful toolbox in assisting such progress since it can work with virtually no antecedent resources as well as with a wide variety of demographic and psychographic variables.

5. OUTCOMES OF EFFECTUATION RELEVANT TO POLICY

5.1 Overcoming Barriers to Entry into Entrepreneurship

People around the world experience and express four main reasons why they do not start ventures or fail to see themselves as entrepreneurs. The following reasons are usually expressed in terms of, "I want to be an entrepreneur, but…"

1. I have no idea
2. I have no money
3. I'm afraid to fail
4. I don't know what to do

7. See https://www.gapminder.org for the bubble graphs.

By 'no idea' they usually mean they don't have a brilliant new idea. And 'no money' can also encompass other resources such as no time, no experience, no power and influence etc. Failure too can vary from imagined bankruptcy and homelessness to the embarrassment of having to start over after a failed venture. A quick reexamination of the five principles shows how effectuation takes away these barriers to entrepreneurship. *Bird-in-hand* takes away the necessity for starting with extraordinary new-to-the-world ideas. It suggests people can begin with mundane ideas that are already doable within their existing means. *Affordable loss* persuades them that lack of resources is not an excuse for not venturing, especially when they combine it with *Crazy Quilt* as a way to expand their resource base. *Lemonade and Pilot-in-the-plane* together provide creative and co-creative ways to deal with failures and cumulate successes respectively. Finally, the effectual cycle in Figure 1 teaches people what to do at every step of the way throughout the entrepreneurial process. In this sense, effectual lessons from expert entrepreneurs de-risk and remove all barriers to action even in the face of uncertainties about the upside.

5.2 Not only for-profit ventures, but ways to tackle wicked social problems

Most importantly, entrepreneurship can and should be taught to everyone as the ultimate back-up option. In the event of economic downturns or even natural and human-made disasters, acting entrepreneurially may be the only option (Nelson and Lima, 2019). Knowledge of effectuation makes this a "live" option by showing how anyone and everyone can act entrepreneurially, irrespective of their traits and circumstances. Moreover, effectuation shows that there are multiple ways to participate in entrepreneurship. One need not even be an entrepreneur to do it. All stakeholders in the process can act effectually, investing no more than they can afford to lose to help cocreate new solutions and possibilities for new futures without having to predict them in advance.

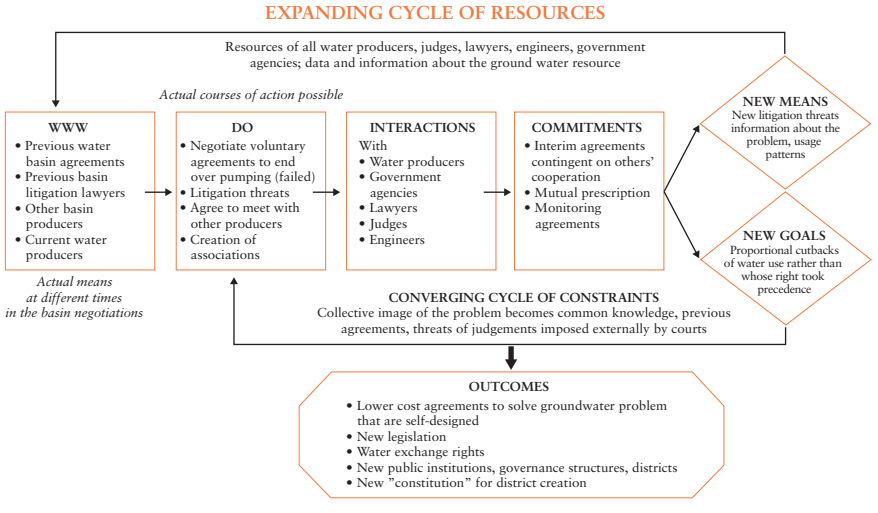
Entrepreneurship is not only the ultimate back-up option. With effectuation, it becomes a "live" option. Even under very difficult circumstances, individuals need not wait for government help. Nor do they need corporate incentives to move forward on values they care about. Entrepreneurial action can precede all of these. Individuals, small groups, communities and professionals can act to productively and even profitably tackle complex wicked problems. A telling example of this is provided by Elinor Ostrom's historical case study (Ostrom, 2015) of the governance of water rights in the Los Angeles area in the 1930s. The following extract from a recent article connecting effectuation with the governance of common pool resources tells the story of the problem (Sarasvathy and Ramesh, 2019). Figure 2 illustrates how the principles of effectuation played a role in solving the following problem:

Groundwater is cheaper compared to importing water from other areas such as Colorado or Northern California. However, these groundwater basins can be destroyed by over use, over extraction or pollution and the costs of even a single basin is exorbitant (p. 106). Extracting more than safe levels of groundwater causes the salt water to intrude into the groundwater basin and eventually destroys the supply of water (p. 106). However, since water is scarce, there are ever-present threats of over extraction by some users.

There were two types of individuals who could pump water in Los Angeles in the 1980s: (a) landowners with land overlaying the groundwater whose claim to water was based on ownership of land, and (b) appropriators who did not own the land and whose claim to water was based on their history of water use under the "first in time, first in right" policy (p. 107). In addition, groundwater producers could also gain use-based water rights through adverse use or via prescriptive rights where appropriators pumped water continuously over a period of time to gain superior water-use rights (p. 108). The uncertainty of these multiple doctrines of water rights was compounded by the fact that no one knew at the time of extracting groundwater what the pumping rates were, the safe yields of the basin, and whether there was a surplus (p. 108). All this led to a pumping race (i.e., over extraction of groundwater and to the depletion of the resource for over 50 years). This represents a typical common pool resource that is non-excludable where use of the good by one person reduces the availability for another.

The problem is relatively complex, and it requires new legislations, markets, policies, and institutions. At first blush, it seems like the most effective processes for finding solutions should be completely predictive since the solutions require changes in multiple interconnected institutional levels. However, the process of institutional change… is overwhelmingly effectual.

FIGURE 2: Effectuation Model Combined with Ostrom's IAD Framework in Solving the Problem of Governing Los Angeles' Groundwater Basins



Source: Sarasvathy and Ramesh, 2019.

5.3 Perhaps the most important possible outcome: Middle class of business

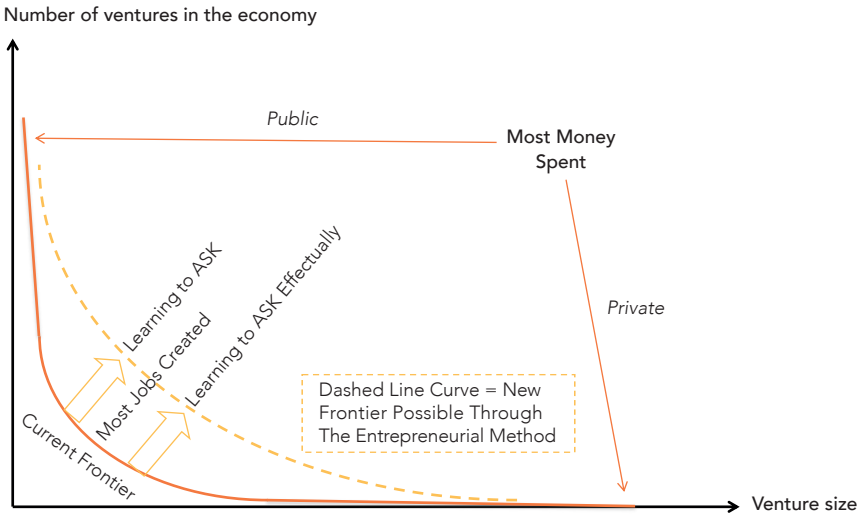
If queried about the positive outcomes of the scientific method and the implementation of science education for all, most people would point to the development of technologies ranging from the iPhone to cures for diseases. A deeper inquiry might connect this up with the industrial revolution and the development of democracy and free markets, even welfare benefits in a variety of market-based economies that have embraced social sciences in addition to the natural sciences. One important societal consequence of the confluence of these developments is the rise of the middle class. Harking back to Rosling's graphs, it is easy to see that both life expectancy and per capita income stagnated for centuries before science and the slow, but inexorable march of human rights and freedom of action, exchange and association began. Historian Thomas McCraw estimates that before the 18th century, wealth and power were mostly concentrated in about 4 percent of humanity and the rest had virtually no choice in livelihoods and no prospects to rise out of the stations they were born in (McCraw, 1998). Freeing people from slavery and indentured servitude of one kind or another led to a freer market in labor that in turn led to the rise of the middle class. Even though recent developments in income inequality raise threats to the existence and spread of the middle class, our very concern with these threats attests to the importance of the middle class in sustaining and nourishing the well being of our species, both locally and globally.

In the realm of businesses, however, there is as wide a chasm between large and small companies as between rich and poor, free and unfree before the 18th century. Figure 3 shows a typical size distribution curve of firms in any economy. Most investments in entrepreneurship are focused on increasing the endpoints of this curve. Public money targets one end of the curve, seeking to increase the number of startups. Private money aims at the other end, seeking to invest in very few high growth companies, so-called unicorns. Yet the real societal benefit worth pursuing consists in pushing the center of the curve outward even if the two ends decrease in the process. Take the case of actual numbers from the US published annually by the Small Business Administration. If we could grow approximately 10 percent of $200K companies to $2M and about 2 percent of $2M companies to $20M, we would have more than adequate stable employment and prosperity in the economy.

The benefits to dealing with social problems such as healthcare in communities or transformation unskilled refugees into productive citizenry could be even larger when entire populations are trained to think and act entrepreneurially. One example

of the latter is an Austrian program for refugees based on effectuation.[8] In general, effectuation incorporates a teachable stance for tackling a variety of social problems as and when needed, without waiting for government assistance or other incentives and interventions. In fact, moving larger entities such as governments to act in more timely, yet innovative ways, can itself become a valuable outcome of universal education in the entrepreneurial method.

FIGURE 3: Building the Middle Class of Business Through the Entrepreneurial Method



There are several keys to achieving this growth of the middle class of business. The first and foremost, of course, is to frame entrepreneurship education and policy in terms of entrepreneurship as method rather than entrepreneurship as outcome. This would challenge and hopefully move the attention from latest fads or toolkits claiming to increase startups and unicorns toward more rigorous content focused on building and running the middle class of ventures. Doing this will require going beyond current work on effectual entrepreneurship to a careful and meticulous development of educational materials *for educators* – not only curricula for students of entrepreneurship, but also for mentors, trainers and teachers of entrepreneurship at all levels of education.

8. Faschingbauer, (2013), *Effectuation: Wie erfolgreiche Unternehmer denken, entscheiden und handeln*. Schäffer-Poeschel Verlag für Wirtschaft Steuern Recht.

6. GREATEST NEED OF THE HOUR: WHAT SHOULD WE BE TEACHING ENTREPRENEURSHIP EDUCATORS?

Entrepreneurship education programs are mushrooming all across the globe. Starting with universities, these are now permeating the entire school system, in some cases beginning as early as the first grade in elementary school. In addition to business schools and technology degrees, entrepreneurship is being taught in the arts and sports as well. Programs and content are also being offered for specialized groups ranging from refugees to executives and from farmers to diplomats. Some are taught by academic researchers and others by practitioners claiming one kind of entrepreneurial experience or another. While there are a few common themes in the content, most are largely ad hoc and subjective. On the one hand, this is cause for celebration in terms of a pluralistic and optimistic approach to an essentially pluralistic and optimistic phenomenon. On the other hand, it might be useful to also be more mindful toward the development of a "core" curriculum as well as at least a minimum set of standards for teacher training in this field.

Perhaps we could build such common content and standards effectually? Policymakers and educators may want to begin with questions such as: What is our bird-in-hand? What is our affordable loss? Who are our self-selected stakeholders? Who else can we bring on board? How do we deal with barriers, known and unknown? How can we cocreate the curriculum and delivery mechanisms?

Let us begin with what is already available in entrepreneurship curricula and then figure out what may yet need to be done. Current toolkits tackle tasks such as ideation, business planning, pitching, team formation, product development, etc. In other words, teaching materials and even teaching toolkits continue to be focused on simply kickstarting the venture creation process. But when it comes to partnering and structuring relationships with a variety of stakeholders, self-selected or otherwise, there are gaping holes in our understanding and curricula, both for students and teachers of entrepreneurship. In a recent study of asks made by 250 growth-aspiring small business owners across the United States, we discovered not only hesitation (even petrification in some cases) when it comes to approaching and asking new stakeholders to come on board, but also anxiety (even panic in extreme cases) when external stakeholders actually agreed to come on board! Every stage of the ask process was beset with psychological, social-psychological and cultural angst. Added to that were confused and inhibiting philosophical notions about market processes being competitive rather than collaborative. Combine these with sheer lack of understanding of deal structure and equity, let alone co-creative deal structure and relational equity, and the task of what needs to be developed in entrepreneurship education and policy becomes clear and compelling.

In sum, the study found that,

- entrepreneurs do not want to ask others to come on board to grow their ventures, partly because they are afraid to ask or afraid of rejection;
- even when they want to, they do not know how to;
- even when they think they may know how to, they usually have wrong assumptions about what stakeholders may or may not want;
- when they do ask, they tend to either be too tentative, simply seeking feedback and advice or help rather than asking for relationships; or too aggressive, seeking to sell or even oversell potential upsides;
- finally and most surprisingly, when stakeholders agree, these entrepreneurs become anxious and even panicked about whether and how to structure the relationship.

Overall, recent research into early stage stakeholder relationships in effectual entrepreneurship has the following important implications for policy objectives in entrepreneurship education:

- Foster research to develop a deeper and more rigorous understanding of relationships between entrepreneurs and their stakeholders, from startup stage to stability and endurance.
- Call for research in the disciplines (psychology, sociology, economics) that go beyond viewing entrepreneurship merely as a setting to test their theories, rather seeing it as a phenomenon of interest in itself that can contribute to and challenge paradigms within the disciplines.
- Double check existing regulations on the barriers that they may be erecting against early stage equity relationships.
- Think through and foster enablers of early stage equity relationships, especially with a view to:
  - Help build consensus on a core curriculum and standards for teaching techniques in entrepreneurship curricula at different levels and for different groups of students.
  - Initiate the development of a framework for training entrepreneurship educators, including standards and metrics.
- Cocreate ways to holistically rethink the relationship between education, employment and entrepreneurship.

7. CONCLUSION: HARKING BACK TO CHYDENIUS

The current primary and secondary school system was designed for a long by-gone era of people who were just coming into the idea that they need not die in the station they were born into. Armed with skills that could power free enterprise in an industrial age, they could transact in a free labor market. As literacy and education levels

grew and the industrial age in market-based economies fueled the development of modern science and technology, the growth of the middle class ushered in productive new ways of living and being for large swathes of humanity. But these positive developments have also brought new challenges, too complex and numerous to go into in depth here. Suffice it to say that these are not merely economic challenges. These pose challenges to the very fabric of society, be it in terms of personal and work relationships, or relationships between government and markets, corporations and the natural environment, even brain and universe.

We have used the scientific method to fuel the industrial age and usher in a more egalitarian set of opportunities, as reality for some and aspiration for all. Hands around the world are raised to grasp these opportunities. These hands now need to grasp the entrepreneurial method to shape and cocreate a variety of new futures and new opportunities for themselves and for all of us. To move from a mentality of scarcity and a desperate search for means to one of abundance and possibility where the problem is not one of scarce resources but that of endless ends worth achieving with whatever resources or constraints surrounding them. Most importantly, to see themselves and everyone around them as the ultimate resource[9] that brings into being all other resources.

Anders Chydenius, a Finnish-Swedish predecessor of Adam Smith, intuited this when he said:

> *Our wants are various, and nobody has been found able to acquire even the necessaries without the aid of other people, and there is scarcely any Nation that has not stood in need of others. The Almighty himself has made our race such that we should help one another. Should this mutual aid be checked within or without the Nation, it is contrary to Nature.*
>
> *The National Gain, §2, 1765 (Jonasson and Hyttinen, 2012.)*

We have to build on this intuition, not as a reluctant acceptance of our dependence on others, but as a delightful opportunity to take our futures into our own hands. And to see others' outstretched hands as not a call for our charity but an investment and an invitation to cocreate futures that can pay dividends that we ourselves cannot even imagine. Effectual entrepreneurship teaches us how to reach out to those hands with our most optimistic and cocreative response, even in the face of true uncertainty. In fact, especially in the face of it.

9. Evocative of *The Ultimate Resource*, a 1981 book written by Julian Simon challenging the notion that humanity was running out of natural resources (Simon, 1981).

KAPITEL 5

ENTREPRENEURIAL EDUCATION FOR SOCIETAL CHALLENGES

NIELS BOSMA

1. THE RELEVANCE OF ENTREPRENEURIAL ATTITUDES, SKILLS AND BEHAVIOR – BACK TO THE FUTURE

The current knowledge-based and data-driven economy is reflected by an automation of routine tasks, spurred by the fast developments in robotization and artificial intelligence. At the same time, societal challenges such as climate change, migration, growing inequalities and population growth have become ever more prominent on the political agenda worldwide. In order to stand out and contribute, local, regional or national communities need to develop attitudes, skills and behavior that pursue creative tasks and provide new solution to these complex, 'wicked' societal problems. It calls, in sum, for entrepreneurial behavior and for an entrepreneurial society that nurtures and rewards such behavior. This chapter argues that 'broad' entrepreneurship education is key to facilitate such a society, not just to educate the new generation of entrepreneurs but also the professionals that play a key role in entrepreneurial ecosystems, stimulating and rewarding entrepreneurial behavior aimed at tackling societal challenges.

While (policy) recognition for entrepreneurship has been quite prominent in most countries since the 1990s, it has been mainly motivated from its asserted attribution to economic growth in the Schumpetarian 'creative destruction' sense.[1] Entrepreneurship was predominantly associated with new (high-tech) startups and scaleups. For this reason it has, in many economies, only appealed to some parts of society. For many

1. See e.g. Wennekers and Thurik (1999), Linking entrepreneurship and economic growth. *Small Business Economics*, 13(1), 27-56.

others, entrepreneurship is (still) primarily associated with profit maximization and the idea that entrepreneurial profits always come at the cost of others; an image largely in correspondence with real-life observations of companies maximizing short term profits for their shareholders. This is the roll-out of the Friedman doctrine: the claim that businesses should only care about serving the shareholder.[2] Currently we see a trend moving away from Friedman's core ideas, not only in the academic literature and popular press. Key corporations in the USA. have recently stepped up to pledge that they will devote their attentions to all relevant stakeholders, not just the shareholders.[3] Also, the concept of social entrepreneurship – entrepreneurship where the primary goal is to tackle societal challenges – has been emerging in the past two decades.[4]

Likewise, it is time for societies to appreciate the overall benefit of entrepreneurial behavior and reorganize their institutions in such way that entrepreneurial activity is recognized and rewarded when it adds value to society, to overall welfare and its distribution across particular groups. Given the tremendous societal challenges we are facing in all parts of the globe, ranging from climate change to overpopulation, migration and inequality, we need new, scalable approaches that can combat or at least mitigate these challenges. This is where entrepreneurship comes in, offering innovative sustainable business models (see e.g. Bocken et al., 2014). In order to achieve the institutional rearrangement where these new forms of entrepreneurship prosper, entrepreneurial education programs need to be developed accordingly so that it caters not only to potential entrepreneurs, but also to their future stakeholders.

Entrepreneurship is a process by which opportunities to create novel goods and services, in an inherently uncertain environment, are discovered, evaluated, and exploited.[5] Productive entrepreneurship is the collection of entrepreneurial activities that create value for society.[6] It should be noted that discovery, evaluation and exploitation should not be seen as phases carried out in a particular, consecutive order. It is a reiterative process: evaluation and exploitation can lead to new discoveries and evaluation tends to be most efficient in the very early phases of exploitation.

The words 'process' and 'opportunities' appear at the start of the abovementioned definition. This is not a coincidence. When discussing and stimulating

2. Friedman (1970), The Social Responsibility of Business is to Increase its Profits.
3. Business Roundtable (2019). Statement on the Purpose of a Corporation. Retrieved on September 1st from https://opportunity.businessroundtable.org/wp-content/uploads/2019/08/BRT-Statement-on-the-Purpose-of-a-Corporation-with-Signatures.pdf
4. Saebi, Foss and Linder (2019), Social entrepreneurship research: Past achievements and future promises. *Journal of Management*, 45(1), 70-95.
5. This definition is based on Shane and Venkataraman (2000) and Stam et al. (2012).
6. Baumol (1990) underlined that institutions largely determine to what extent entrepreneurial activities produce productive entrepreneurship. This also links to Lackéus' (2015) definition of entrepreneurship, creating value for others.

entrepreneurship education, ample attention should be placed on the entrepreneurial process and the personal link between the individual (the student) and the opportunities s/he perceives. What drives an individual, what annoys an individual and what potential entrepreneurial opportunities are unfolding? Knowledge about personal identity, strengths and personal interests are key for being able to cope with, and act under, uncertainty. It also makes sure the individual genuinely enjoys what s/he is doing while creating value for others and is prepared to be perseverant when it comes to pursuing entrepreneurial activities (Lackéus, 2015).

2. THE NATURE OF ENTREPRENEURSHIP, ENTREPRENEURIAL OPPORTUNITIES AND IMPLICATIONS FOR ENTREPRENEURSHIP EDUCATION

Recent debates in the entrepreneurship literature zoom in on what exactly entrepreneurial opportunities entail and how to go about this. This ongoing discussion is much needed for a better demarcation of the field and a firmer grip of the role of entrepreneurial activity in spurring economic and societal development. Wood and McKinley (2017) discuss three viewpoints. One view on the nature of opportunities is that opportunities are simply 'out there', effectively available to be picked up, evaluated and exploited. From this point of view, it takes alert and talented individuals to do so (Shane and Venkataraman, 2000).

A second view is the 'creation' perspective put forward by Alvarez and Barney (2007), where opportunities develop and unfold themselves only as entrepreneurial action progresses. From this perspective, anyone can be (and is) an entrepreneur. The effectuation perspective introduced by Sarasvathy (2001) centers on principles that can be shared under the 'creation perspective'. One famous example is how the concept of the Ice Hotel emerged, starting from a cultural ice sculpture festival, and capitalizing on learnings from some unexpected events, and creating opportunities by combining these with existing resources.[7]

A third view, called the 'actualization perspective' positions itself in between and sees opportunities to be residing outside the consciousness of the entrepreneur (Ramoglou and Tsang, 2016). Even though opportunities are real, they cannot be objectively measured or detected; they are unobservable. Some of these real opportunities (or ideas) may only be capitalized on when the 'context' is ready.[8] The introduction of a tablet by Microsoft about ten years before the introduction of the iPad

7. See https://www.effectuation.org/?x-portfolio=ice-man-cometh-the-story-of-icehotel, last accessed 10 October 2019.
8. This view is relatively recent and under some debate; for example Davidsson (2015; 2017) prefers to avoid the word opportunities and sees entrepreneurship as the result of the interaction between new venture ideas and 'external enablers' such as new technology.

can be seen as an example of such an opportunity; the 'complete' opportunity of the iPad, connecting apps in an online store, was not detectable at the time Microsoft launched their version of the tablet.

Discussing these different perspectives when developing programs that address entrepreneurial opportunities within entrepreneurial education programs should move learnings to a higher level. For instance, 'observable opportunities' should call into question how unique they are and to what extent they can lead to new value creation through scalable entrepreneurial activities. It does not mean such opportunities cannot result in successful entrepreneurship. For instance, knowledge of successful entrepreneurial approaches in other contexts (for example in other countries or in other industries), may be adjusted and implemented in the local context. On a similar note, a given status quo should be called into question as there may be some, so far hidden, problems that can be alleviated – perhaps adopting technologies that were not available before. Here, bringing in perspectives from different disciplines or contexts can lead to relevant insights that may challenge the status quo.

Epistemic ideas concerning entrepreneurship education are, however, limitedly recognized as such or taken for granted in the context of entrepreneurship education outcomes (Rahm, 2019). This can be linked to the traditional connotation of entrepreneurship. With targeted outcomes of entrepreneurship education being self-perception of skills, entrepreneurial intentions, observed number of startups rather than observed measures of its key innovative, creative and transformative features.[9] Next to a bias toward subjective outcomes, impact studies on entrepreneurial education also tend to be heavily biased towards short-term outcomes (Nabi et al., 2016). It may be well conceivable that students apply their accumulated entrepreneurial skills later in their career, once they have, for instance, built a network they can capitalize on.

A firmer integration of entrepreneurial education with education programs focusing on societal challenges may encourage its design and impact evaluations to be much more geared towards its innovative, creative and transformative elements. Collaborative processes (within both entrepreneurial teams and entrepreneurship ecosystems) produce learning outcomes that may be instrumental in turning new knowledge into scalable solutions for pressing problems perceived in the world. For universities this entails creating a hotbed that brings together new knowledge, talent, the business world and (impact) investors, combined with extra-curricular

9. For example, Oosterbeek et al. (2010) find that the entrepreneurship education program they have investigated 'does not have the intended effects', as its effect on entrepreneurial intention (based on the statement "I expect to start up a new firm or to take over an existing firm within the next fifteen years" and answers on a seven-point scale ranging from "completely agree" to "completely disagree") is negative.

offerings. This can only be effective if accompanied by a thorough, well-supported university leadership (Morris et al., 2014).

3. DEVELOPING ENTREPRENEURSHIP EDUCATION PROGRAMS

Entrepreneurship education program developers should first address questions at the ontological level: what does entrepreneurship education mean, what does education mean in the context of entrepreneurship and what are the roles of educators and participants (Fayolle and Gailly, 2008)? Answers to these questions feed the choices to be made at the educational level and learning objectives can be stated. Following up on Fayolle and Gailly (2008) and Maritz (2017), the following elements can be discerned:

3.1 Entrepreneurial education for whom: the need and challenge to reach a broad audience

Developing entrepreneurial education through the lens of societal challenges calls for an inclusive approach and requires a broad audience. Many students are not only aware of the challenges society face, but are also willing to act and contribute to potential solutions. In this perspective, becoming entrepreneurial is the initial focus, rather than becoming an entrepreneur starting and/or running an own business (which may or may not be an outcome). How can you move from discussing problems, observed disharmonies and derived anomalies towards action combating such anomalies? Entrepreneurial behavior can also take place in larger organizations; how can students help innovate existing organizations? And even for students who do not aspire to become entrepreneurial, how can they appreciate positive changes through entrepreneurship as a potential future actor in the entrepreneurial ecosystem? To reach this audience, initial communication may need to refrain from using the word entrepreneurship. Terminology such as 'pioneering for new value creation', 'becoming a changemaker', or 'facilitating innovative behavior' may resonate better. The idea is not to deceive students by integrating entrepreneurial awareness and skills, but to open their eyes for what entrepreneurial behavior can mean for them to pursue their ambitions. At a later stage they can opt for more dedicated courses that focus on developing entrepreneurial skills, preferably closely connected to their own discipline, while being open to (and appreciating) collaborations with other disciplines.

3.2 How to teach entrepreneurship? Blending three pedagogical perspectives along the education program

In terms of pedagogy, entrepreneurship education can be classified into three main categories (Lackéus, 2015; Fayolle and Gailly, 2008). First, the 'teaching about entrepreneurship' perspective focuses on reproduction methods, mainly based on

lectures and readings. Second, the 'teaching through entrepreneurship' perspective focuses more on personalized/participative methods. Finally, the 'teaching for entrepreneurship' perspective emphasizes the development of competences, focusing on communication, discussion and production methods.

Lackéus (2015) argues that individuals would best start out with the 'learning through' pedagogy. Entrepreneurship is positioned in a wide discussion on societal challenges while action is based on everyday problems and connects the individual with her close environment. This wider scope may be continued in a second step, where acting on curriculum knowledge is geared towards new value creation and eventually entrepreneurial modes of value creation are developed (without starting a business). In addition, a narrower scope can be offered in which 'education about' entrepreneurship plays a bigger role; it adds business language and venture creation tools. These individuals are prepared to become entrepreneurs via 'education for entrepreneurship', providing tools for sustainable venture creation and possibly resulting in new startups.

3.3 What to teach? From identity work to business modeling

Given the learning objectives and preferred pedagogical perspective, a phase-based teaching model can be developed. Below we largely follow Thrane et al. (2016) who propose the following structure, where it should be highlighted that the suggested linearity may not take place in such an ordered manner:

1. Identity work: this part lays the foundation that student can fall back on when they undergo the entrepreneurial learning process. It involves a self-assessment of personal personality, expertise, interests, social capital and other resources, as well as personal strengths and weakness relevant for teams. Even though a starting point, students may actually discover new things about themselves along the entrepreneurial learning process.
2. Opportunity recognition and creation nexus. This is a crucial, re-iterative phase that encompasses the process around the nature of opportunities discussed in section 2 of this chapter. Thrane et al. (2016) actually discern two separate phases, where the first consists of disclosing disharmonies (connected to opportunities emerging from the nexus of disharmonies and disclosive spaces students operate in). The second phase is entered when such disharmonies appear to be pervasive and can be framed as general anomalies. Since anomalies are often context specific and there may not be a clear distinction, these two phases combined can be characterized primarily by the interplay between different opportunity discovery and opportunity creation processes that may lead to ideas for new solutions to the observed anomalies.
3. Constructing innovative solutions. In this phase students construct an innovative concept that initiate change that responds to the opportunities that have been identified. This can be done in different ways, for instance by adopting

and integrating knowledge from a different discipline, by connecting existing methods with new technology or other types of reconfigurations.

4. Prototyping. Next to using a prototype to entice and attract new users and customers, it also turns so far tacit ideas for solutions into a concrete artifact and exposes the practical steps that need to be taken. It often leads to reassessment of opportunities and possibly the emergence (creation) of new opportunities.
5. Business modeling. In the business modeling phase, the students learn how to organize and achieve the intended value creation for their users and customers. They start with optimizing their value proposition and then move on adopting tools such as the nine building blocks of the widely used business model canvas (Osterwalder and Pigneur, 2010).

Thrane et al. (2016) convincingly show that, while every phase described above may benefit from each of the three pedagogy types, it primarily emphasizes the use of the experiential 'teaching through' pedagogy entrepreneurship. Depending on the available resources (mostly in terms of time span and/or credits offered) and the specific objectives, educators can focus on part of this structure. However, an entrepreneurship education program would at least allow individuals to move from phase 1 to phase 5, with an opt-out in phases 4 and 5 when the content is more business specific and business skills are emphasized.

3.4 Assessment and evaluation: emphasizing the process rather than the outcome

Entrepreneurship education typically presents challenges in terms of assessment and evaluation in the sense that the long-term goals are hard to make explicit and difficult to capture. The learning 'through' pedagogy that is arguably the most dominant and most supported pedagogy when it comes to entrepreneurship education, requires an assessment of the entrepreneurial journey an individual undergoes and the learning effects thereof. In line with the emphasis on identity at the start of the entrepreneurial journey, Lackéus (2014) and Nabi et al. (2017) propose a shift towards researching emotion-based impact indicators. Emotion-based indicators, related to for instance inspiration, exposed uncertainty and passion that may be experienced or developed during the program, tend to fall outside the standard evaluation forms and may be included in standard assessments as well as derived from personal journals that are developed by students throughout the entrepreneurial education program.

Assessments would also emphasize the connection between various phases. To what extent is a prototype innovative and how does it connect to observed anomalies? Does the developed business model indeed connect the dots and have learning elements been incorporated? Clear assessment rubrics are required to signal to students what the higher-level aims are, in order for them to be prepared to real-world entrepreneurial processes. Hence, these process elements should be reflected in the

grading criteria. On a similar note, the manner in which stakeholders are involved and feedback has been dealt with deserves intention, most certainly when the goal is to create value for society.

4. ENTREPRENEURSHIP EDUCATION AT DIFFERENT PHASES

Much of the attention for entrepreneurship education (including academic research) is devoted to higher education. However, getting acquainted with the mix of new value creation, interaction with the real world, teamwork and action that entrepreneurship education entails (Lackéus, 2015) is vital at primary and secondary schools at the age when achievement ambitions are formed. Hence, introduction of challenged-based programs in primary and secondary schools are a welcome counterbalance for the more traditional forms of education that focus on a combination of analytics, reproduction and application.

Programs or modules in primary school may focus on local (societal) challenges, for example how to make a crossing near the school safer or how to make the school more energy-efficient.[10] Such modules would in particular focus on developing identity, achievement ambitions and teamwork skills, discussing possibilities to create new value in their own neighborhood. Children can discuss and identify disharmonies in their environment and construct creative solutions without worrying too much about feasibility and implementation.

Secondary schools' programs should continue with challenge-based, 'learning though' types of education, but put more emphasis on prototyping and some basic elements of doing business. Challenges may be proposed by organizations active in the region including the municipality, supermarkets, fashion stores, ngo's, sports clubs, universities etc. Elements of effectuation (see also Chapter 2 by Sarasvathy; Sarasvathy, 2001) can be used to ensure that the children do not 'overthink' the solution and apply the action-mode once they believe they have something valuable and can create a prototype. Indeed, broad entrepreneurship education in this phase would adhere the 'opportunity creation perspective': anyone can contribute to coming up with new ideas for value creation.

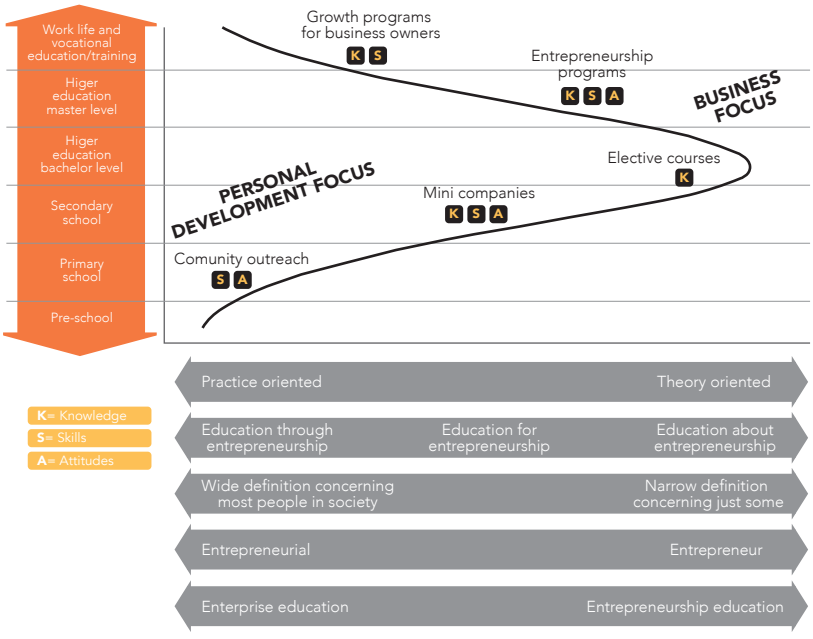
For higher education the cognitive component ('teaching for entrepreneurship') becomes more important, however nuances become apparent as well. In vocational school programs and at universities of applied sciences, developing practical skills can be emphasized more. This includes typical business modeling and business

10. Junior Achievement is an example of an organization that facilitates such programs, see http://www.jaeurope.org/ for the European branch.

planning tools, as well as planning, organization and financial administration. Here, the opportunity creation perspective blends in with the opportunity recognition perspective. At business schools, more attention to context will be added: how to create and develop a flourishing innovation ecosystem, how to manage internal and external expectations and incentives when scaling a business. Technical universities will pay more attention to integrate engineering and design with business modeling, while broad research-intensive universities can connect disciplines, integrate new knowledge from one discipline into another and develop critical views on new value creation.

Higher education institutes also have interesting opportunities to cater to the needs of lifelong learning and develop programs for PhD students, postdoctoral students and professionals. Providing knowledge, skill development and reviving the attitudes when it comes to entrepreneurial behavior can be a great proposition to alumni and hence a way to keep them connected. At the same time, they can feed in knowledge and experiences and contribute to the school or university's entrepreneurial ecosystem. The next section will focus on how broad, research-intensive universities may operate and develop such ecosystems.

FIGURE 1: Entrepreneurship education characteristics at different levels



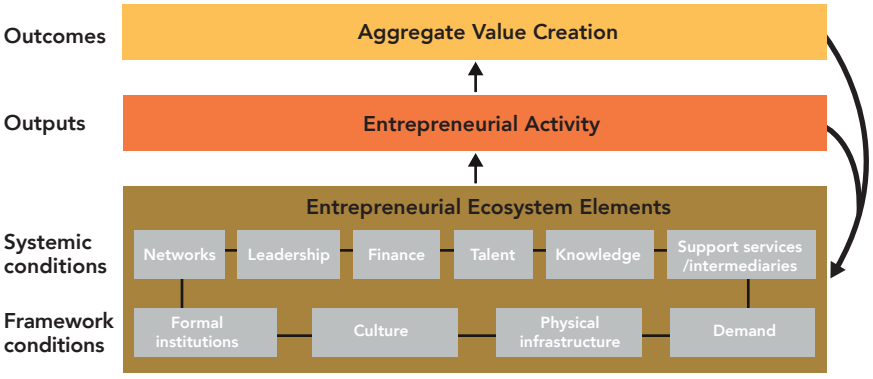
Source: Lackéus (2015).

5. RESEARCH-INTENSIVE UNIVERSITIES AND THEIR ROLE IN ENTREPRENEURIAL ECOSYSTEMS

Based on the mission to develop and connect education, research and value creation for society, research-intensive universities make for a fertile environment for new entrepreneurial initiatives aimed at tackling societal challenges. The research activities form an important resource of new knowledge and new technologies, and university staff and students – curious and intrinsically motivated – have the capacity to identify and act on opportunities. Other qualities and experiences that they possess, such as tolerance for failure, dealing with uncertainty, being able to work in (temporary) coalitions make research-intensive universities an ideal environment for fostering entrepreneurial skills and attitudes (LERU, 2019).

In the course of the past three decades, universities have become important contributors to the innovation system, by creating and transferring new knowledge. We see more and more universities explicitly stating that they aim to enhance the entrepreneurial ecosystem (Audretsch et al., 2019) or develop into an entrepreneurial university (Morris et al., 2014). Stam (2015) indeed identifies universities as one of the key players in local entrepreneurial ecosystems, where entrepreneurial ecosystems are defined as the set of actors and factors that is coordinated in such a way that they enable productive entrepreneurship within a particular territory (see Figure 2).

FIGURE 2: Entrepreneurial ecosystem framework



Source: Stam (2015).

Universities represent several of the relevant actors and factors that form the systemic conditions that shape a local entrepreneurial ecosystem (for instance by supplying new knowledge, by shaping talent and by acting as a key node in relevant networks). Importantly, they can also ensure the interaction between those and take on a leadership role in the system. A well-functioning entrepreneurial university,

with a broad view of what entrepreneurship entails, makes for a good structure that connects research, education and value creation with – and for – society. This makes it essential for local decision makers and university leadership to collaborate on nurturing entrepreneurial ecosystems and to establish the role of the university herein. For this to happen, universities need to move themselves towards becoming entrepreneurial universities.

5.1 Key elements of successful entrepreneurial universities

Research by Fetters et al. (2010) based on analyzing leading university-led entrepreneurial ecosystems suggests seven key factors to be successful in developing a flourishing entrepreneurial ecosystem in which universities are highly embedded: (1) senior leadership vision, engagement and sponsorship, (2) programmatic and faculty leadership, (3) sustained commitment, (4), substantial financial resources, (5) openness to continuous innovation in the programs offered, (6) an appropriate organizational infrastructure and (7) commitment to building the enterprise and achieving critical mass. Morris et al. (2014) identify similar factors in search for success factors of entrepreneurial universities but also come up with additional elements such as co-curricular programming, shared learning, proactive publicity and developing appropriate outcomes and metrics. Descriptions of universities that made a promising or successful transition towards becoming an entrepreneurial university show that the combination of providing required framework conditions and enabling and promoting entrepreneurial education for their students, PhD's and staff members proofs to be productive. They also tend to reinforce each other; for example, students involved in entrepreneurial education tend to be motivated to contribute to the entrepreneurial ecosystem at the university.[11]

5.2 Organisation of entrepreneurship education in research intensive universities

While some of the abovementioned factors should be facilitated and openly endorsed by the overall university leadership, implementation largely takes place at the faculty / department and graduate school level. Hence, faculty leadership that acknowledges the importance of entrepreneurship education within their domain and provides the appropriate measures and resources is a necessary requirement. For research-intensive universities it therefore makes sense to develop a university-wide platform that is 'T-shaped': stimulate the development of entrepreneurial attitudes and skills as it is relevant for all faculties and genuinely embed the modules, courses and programs in the faculty curriculum. To showcase the importance of stimulating 'entrepreneurial minds and action', the conversation (proactive publicity) is initially to be focused on the societal challenges that students and staff members care about.

11. A recent advice paper by the League of European Research Universities further corroborates evidence with case descriptions at European research-intensive universities (LERU, 2019).

This is relevant in particular at faculties where mainstream researchers and educators do not attach positive connotations to the word entrepreneurship. In effect, for modules (small courses, partial modules within courses, or parts of dedicated skill development courses) it may make sense to avoid the word entrepreneurship altogether in the title.

Figure 3 represents a prism with a diverse set of students entering a particular program. Faculties design programs in such way that a large share of the students get exposed to entrepreneurship education in some way and in an early phase in their program. This could be limited to a module without action-based education, even though action-based learning is to be preferred. Other options are courses that may be mandatory or electives. Finally, a coherent set of courses in the form of a minor or major caters to students who want to specialize in a direction that involves entrepreneurial thinking and behavior. The idea is to maximize the number of students to go into the prism, so they can decide for themselves how to move within the prism (possibly taking a dedicated course after having enjoyed a module) and what kind of entrepreneurial approach (color) they exhibit once they are outside the prism.

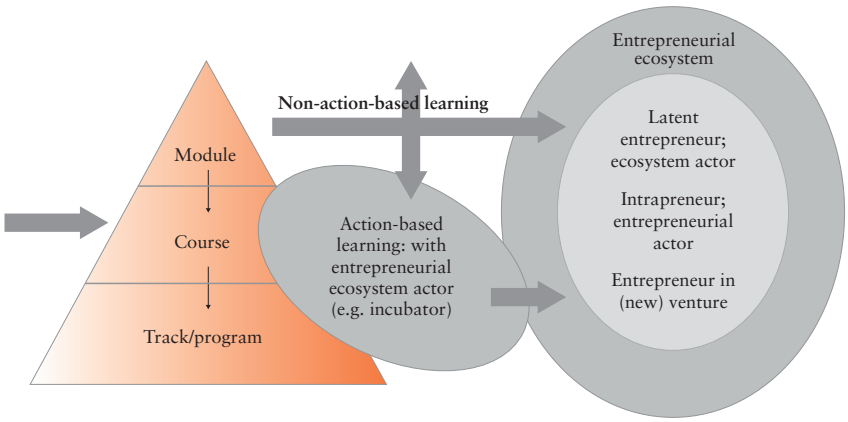
There are several options for students to reap the benefits of entrepreneurship education. First, some of them become entrepreneurs themselves, where some will become more successful than others. Research has shown that being ambitious at the outset is close to a necessary requirement for entrepreneurs to become successful when it comes to achieving growth in terms of turnover and employment (Stam et al., 2012). Research has also shown that achievement ambitions tend to be formed at the age when children are in secondary schools (Spenner and Featherman, 1978).

Second, some of the students will turn out to be intrapreneurs: employees that pursue entrepreneurial activities as part of their job – mostly on own initiative. Employers increasingly value employees that can strike a good balance in being entrepreneurial and operating along the company's mission and core values. In some countries, the estimated number of intrapreneurs exceeds the number of owner-managers in new and young firms (Bosma and Kelley, 2019). For this reason, developing intrapreneurship programs in executive education programs may serve existing needs in the market and ensure new connections between the business world and universities.

Third, students may not end up pursuing entrepreneurial behavior but still become part of the entrepreneurial ecosystem. This could for example be in a role of policy maker, financial expert or business developer. In such a role they can contribute to the impact entrepreneurship can have on society. Hence, entrepreneurial education is not just for future entrepreneurs. As Nobel Prize winner William Baumol put forward, the entire set of institutional settings determine to what extent

entrepreneurship will turn out to be productive for society (Baumol, 1990). The entrepreneurial ecosystem framework helps to achieve this at the local level.

FIGURE 3: Linking entrepreneurial education to entrepreneurial ecosystems



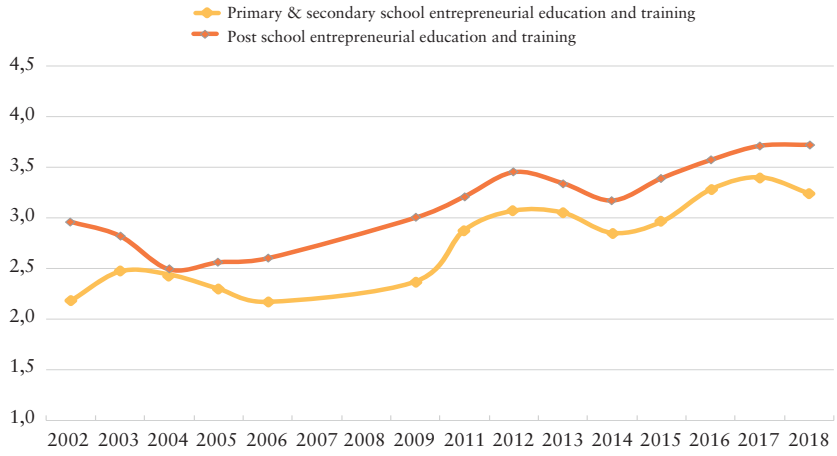
5.3 Positioning a center for entrepreneurship: the case of Utrecht University

Utrecht University is a primarily gamma-oriented, traditional academic university (founded in 1636) that has included development of entrepreneurial attitudes and skills and contributions to societal challenges as key strategic directions, aligning with Clark (1998) and Gibb (2002). At the same time this university, with no business school or engineering faculty, makes for a rather different context than universities mostly described in the literature on entrepreneurial universities. There are seven faculties where teaching programs are hosted from: Faculty of Geosciences, Faculty of Humanities, Faculty of Law, Economics and Governance, Faculty of Medicine, Faculty of Science, Faculty of Social and Behavioral Sciences and the Faculty of Veterinary Medicine. Utrecht University has put in place a research infrastructure that leads to combining different disciplines and integrated approaches to academic and societal issues. With its chosen university-wide research themes of Sustainability, Life Sciences, Institutions and Dynamics of Youth, the university contributes to solving issues such as climate change, infectious diseases, the aging population, social cohesion and security.

The increased emphasis on entrepreneurship education at Utrecht University mirrors a general trend in the Netherlands. Figure 4 shows the progress of two Global Entrepreneurship Monitor (GEM) indicators over time that capture entrepreneurship education at schools and at higher education institutes, based on annual

expert assessments (scales 1-5) in the country. It shows an overall increase in the appreciation and adoption of entrepreneurship education, with higher education consistently being assessed better than primary and secondary schools.

FIGURE 4: Expert assessment of the quality of entrepreneurship at primary/ secondary schools and higher education institutes



Source: Global Entrepreneurship Monitor (www.gemconsortium.org).

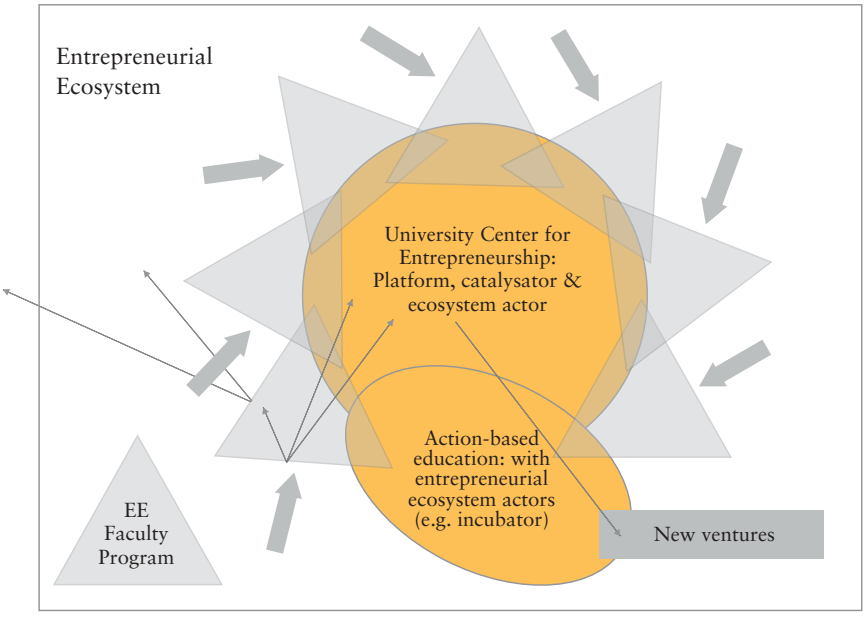
Utrecht University has created a Centre for Entrepreneurship that acts as a platform and connects all activities on entrepreneurship education and research at the seven faculties. Its goal is to act as a catalyst, help develop bottom-up initiatives within the faculties and facilitate entrepreneurship education 'ownership' within each faculty. As such it aligns with e.g. Morris et al. (2014) to establish a successful university-wide entrepreneurship program. It aims to establish a culture to support 'entrepreneurship to make a difference', where the university becomes an empowering environment that support students and staff to creatively pursue new opportunities and innovations. As such, the Centre encourages the development of relevant courses, programs and co-curricular activities and provides information and inspiration.

Figure 5 showcases how the Centre for Entrepreneurship operates within University. In correspondence with Figure 3, students usually get exposed to entrepreneurial education within their faculty, possibly in a multidisciplinary setting. Students may then move towards more dedicated, action-based entrepreneurship education within and/or outside their curriculum. The University's emphasis on multidisciplinary research and education ensures that interdisciplinary networks exist and entrepreneurship educators from different disciplines know how to find each other. This is facilitated by a dedicated university-wide entrepreneurship educators' network,

that meets three times a year and discusses new initiatives, innovations in teaching methods etc. The Centre for Entrepreneurship puts together overviews of entrepreneurship-related courses and minors, as well as extracurricular opportunities and events. This aims at inspiring students and to open their eyes to the potential merits of applying entrepreneurial behavior in the expertise set they are developing. As the thin arrows in Figure 5 show, students may end up as an entrepreneur, as an actor in the entrepreneurial ecosystem, or outside the entrepreneurial ecosystem. They may also pursue their gained knowledge and skills as an intrapreneur. As mentioned in the introduction, established companies are increasingly interested in young talent that can help them making an entrepreneurial transition towards addressing more stakeholders and meeting societal challenges.

Taking a platform and catalyzer role has its advantage since it can connect all seven faculties. However, the downside is that its organization may be fragile in case it is fairly small in size and continuously reliant on (financial and non-financial) support, initiative and a sense of ownership at each of the faculties. The Centre of Entrepreneurship at Utrecht University has its administrative home at the department of Economics (part of the Faculty of Law, Economics and Governance) and connects to the section of entrepreneurship at the department.

FIGURE 5: Positioning a center for entrepreneurship as a platform in a research-intensive university and an entrepreneurial ecosystem: the case of Utrecht University



6. CONCLUSION: THE NEED FOR ENTREPRENEURIAL LEADERS AND FEEDERS AND THE RESPONSIBILITY OF TODAY'S UNIVERSITIES

This chapter has argued that in times of fast-changing technology developments, pressing societal challenges and increasing uncertainty about the future of work, there is an urgent need for societies to (i) make entrepreneurial attitudes, skills and talent flourish in order to provide a broad and multidisciplinary talent pool that can develop new ideas into scalable business solutions; and (ii) develop appropriate entrepreneurship ecosystems to facilitate and enforce societal value creation emerging from dedicated entrepreneurial activities. A key characteristic of successful ambitious entrepreneurs is their ability to deal with risks and uncertainty, given the expertise they have access to. Successful entrepreneurs are also perseverant, and this can only be achieved if they can truly identify themselves with the type and content of work they have literally ventured into. This calls for a clear vision and strategy on entrepreneurship education. Since the societal challenges are complex and for instance involve new technologies as well as behavioral elements touching on sociology and psychology, while also learnings from the past remain valuable, interdisciplinary thinking and acting is to be integrated in entrepreneurship education.

Connecting to for example the breadth of the United Nations' Sustainable Development Goals (SDG's), a broad understanding of the concept of entrepreneurship is needed, in which the 'act' or behavioral aspect of entrepreneurship comes to the fore. Entrepreneurial behavior relates to a process by which opportunities to create novel goods and services, in an inherently uncertain environment, are discovered, evaluated, and exploited. Increasingly, new knowledge creation will be steered towards solutions that work for society. We can expect more (public and private) funds that aim for the SDG's and this connects well to the interests of younger generations. It requires interdisciplinary thinking and action for new ideas aimed at combating societal challenges to turn into scalable business solutions.

While this chapter has argued that an encompassing view on entrepreneurial education is required, stretching from primary school to higher education, the role of universities is particularly critical since they can play a key role in the local entrepreneurial ecosystem. Universities connect new knowledge, talent and relevant actors and can thus take a leadership position in local entrepreneurial ecosystems. They also educate young talents, such as policy makers, regulators, bankers and educators, who will be future shapers of such ecosystems. Hence, it is in the interest of local and national communities, including economic boards, to push universities to consistently ensure that entrepreneurial education can be

accessed easily. Entrepreneurial behavior is, in principle, fit for everyone – an eminent mechanism to connect the primary tasks of education, research and value creation for today's society. It is then up to the student how, to what extent and in particular for what purpose students will further develop their skills.

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Intresset för entreprenörskap och frågan om hur entreprenörskap bäst främjas har vuxit under flera årtionden. Detta bygger på insikten att entreprenören är en förändringsagent som både driver samhällsutvecklingen och skapar stora samhällsvärden. Entreprenören skapar ekonomisk dynamik, förnyelse och högre välstånd genom sin unika förmåga att hantera risk, utmana existerande strukturer och bygga värden. Givet detta, kan entreprenörskap läras ut? Är det genetiskt och socialt betingat eller går det att lära sig som en metod?

I *Swedish Economic Forum Report 2019: Entreprenörskapsutbildning – Går det att lära ut entreprenörskap?* kartläggs forskningen om entreprenörskapsutbildningar: Går det att utbilda i entreprenörskap? Hur bör entreprenörskapsutbildningar utformas för att fungera?

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