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Can Entrepreneurship be taught?
Case: The Lean Start-up

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The aim of this thesis was to identify whether entrepreneurship can be taught. Various commentators have noted that entrepreneurs are born and not made and this thesis had the purpose of reviewing whether educational methods and teaching could actually aid individuals in becoming entrepreneurs.

The study is an exploratory research in nature and therefore qualitative methods were used to collect data. As a result, individual in-depth interviews generated the primary data from nine responders - three Lean Start-up practitioners from different sized companies, three university lecturers and three Metropolia University of Applied Sciences students. Secondary data was collected from various literature, articles and news.

The results revealed that the entrepreneurship education is in the process of being modernised to meet the skills and knowhow needed in the current labour market. There still remains a number of traditional approaches and bureaucratic activities that do not create value in developing an individual into an entrepreneur. The main conclusion was, that the process is moving towards the Lean Start-up method which offers practical ways to activate students toward an entrepreneurial viewpoint. Furthermore, the Lean Start-up methodology helps students to validate hypotheses that are unknown and increase their rate of implementing experiments and tests. Overall, the Lean Start-up methods are approachable, practical and applicable, therefore lowering the threshold of becoming an entrepreneur.

Keywords	Entrepreneurship, Education, Lean Start-up, Start-ups, Business Model Canvas, Customer Development, Agile Development

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1   Introduction

Finding a permanent job in recent years has been highly uncertain due to the economic crisis, which started in 2008. Many European countries including Finland still feel the effects of the economic recession, and have a difficult time experiencing growth. Finland has attempted to promote economic growth in various ways with minimal results as of 2014.[1] The outcome has been a rising unemployment rate and further economic uncertainty.[2]

The difficult economic situation has also had an impact on education. Educational institutions responded by introducing different solutions in order to tackle the poor economic outlook. Institutions have started to rethink ways of how to modernise education because the current approach may be out-dated due to a transformation of a society.[3] Some primary schools have even gone as a far as introducing computer programming as part of their core curriculum.[4]

Entrepreneurship education has also received increasing attention, because it is seen as one of the solutions that could reduce the unemployment rate and improve economic growth by helping people to employ themselves. Entrepreneurship is taught by the introduction of the skills that are important in working life. Besides teaching activities important in running a business, such as accounting and sales, entrepreneurship education also promotes a proactive mind-set and attitude.[5] If applied in the right way, entrepreneurship could empower people to take control of their economic future.

However, according to Steve Blank, a professor at Stanford University, traditional entrepreneurship has evolved to include new innovative practices, such as the Lean Start-up method. [6]

The tendency to stick to traditional entrepreneurship methods is also true in Finland where public institutions still require business plans as a basis for funding of early companies through grants.[7] As a result, in order to get funding, the entrepreneur must create a plan filled with assumptions which are estimations of future profits, which may not be based on facts.

1.1 Aim of the thesis

The aim of the thesis is to present alternatives for the entrepreneurship education that showcases the best practices that have been implemented around the world. Specifically the Lean Start-up, which is one of the main topics of this thesis, has therefore been chosen because it is a new method for entrepreneurship education.

Additionally, several different groups of responders have been interviewed, in order to contrast the best practices with the current methods of entrepreneurship education. The eventual purpose is to analyse the thoughts of the interview responders in hopes of uncovering possible opportunities to improve entrepreneurship education.

1.2 Introduction to Lean Start-up

Today, entrepreneurs constantly face risks and challenges in the environment of high uncertainty.[8] In order to minimise risks entrepreneurs need to seek ways to be completely confident about their guesses. Thus, this section is a brief overview of Lean Start-up and the practitioners involved in the creation of the theory. The literature review will cover the theories in more detail.

The Lean Start-up is a method developed by Eric Ries and contains principles that are explained concisely below (Ries, 2011: 8-9). The five principles comprise the theoretical foundation for the Lean-Start-up method.

1. **Entrepreneurs are everywhere.** Entrepreneurs are everywhere and the Lean Start-up approach can work in any size company, even a very large enterprise, in any sector or industry.

2. **Entrepreneurship is management.** A start-up is an institution, not just a product, and so it requires a new kind of management specifically geared to its context of extreme uncertainty.

3. **Validated learning.** Start-ups exist to learn how to build a sustainable business. This learning can be validated scientifically by running frequent experiments that allow entrepreneurs to test each element of their vision. (Explanation given in the appendix 4.)

4. **Build-Measure-Learn.** The fundamental activity of a start-up is to turn ideas into products, measure how customers respond, and then learn whether to pivot (Explanation given in the appendix 4) or persevere. All successful start-up processes should be geared to accelerate that feedback loop. (See the Figure 16 in the section of 2.6.4)

5. **Innovation accounting.** To improve entrepreneurial outcomes and hold innovators accountable, we need to focus on how to measure progress, set up milestones and prioritise work. This requires a new kind of accounting designed for start-ups and people who hold them accountable.
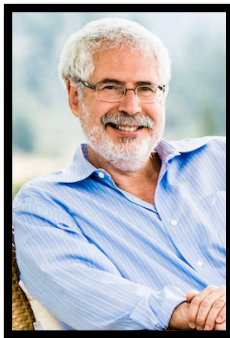

Figure 1 Steve Blank

Steve Blank, is an academic and entrepreneur (Figure 1) is the founding father of the Lean Start-up who developed the key methods that act as a basis for it. Today, he teaches entrepreneurship to undergraduate and graduate students at U.C. Berkeley, Stanford University and Joint Executive MBA programme at the Columbia University and Berkeley.

By separating a traditional model of entrepreneurship education and activities of Lean Start-up, Blank initiated the change in the U.S entrepreneurship landscape. The traditional model of entrepreneurship education consists of business plans and continues time consuming planning processes, which may not be validated. Alternatively, the activities of Lean Start-up involve the creation of hypotheses, customer development and agile development. These concepts and methodologies are introduced in their own sections (section 2.6) in the thesis.

Figure 2 Eric Ries

Eric Ries (Figure 2) first coined the term "Lean Start-up" for trademarking purposes in his first book The Lean Startup (Maurya, 2012: XXIII). In this thesis, the general definition of the Lean Start-up methodology contains entrepreneurs, entrepreneurship, validated learning, Build - Measure – Learn and innovation accounting (Ries. 2011: 8-9) which most authors agree with. The Build – Measure – Learn will be presented in its own section because it became a vital tool for product and customer developers especially in start-ups.

Figure 3 Alex Osterwalder

Alex Osterwalder (Figure 3) is the co-author of Business Model Generation and the originator of the business model canvas. The Business Model Generation was a book introducing the business model canvas, and made it mainstream. It introduced a standard-ised framework for businesses and entrepreneurs to use it as a tool or method to achieve validated learning. The canvas contains nine building blocks of business: customer segments, customer relationships, value proposition, channels, revenue streams, cost structure, key part-ners, key resources and key activities. Because the business model canvas is an im-portant part of the Lean Star-up, the canvas will be introduced in section 2.6.1.

Figure 4 Ash Maurya

Following the work of Osterwalder, Ash Maurya (Figure 4) devel-oped the business model canvas further by introducing his version called the lean canvas in his Running Lean book. Throughout the book, Maurya presents more concrete tools for those who struggle with start-ups or companies. Furthermore Running Lean is a step forward from the work of Eric Ries' because The Lean Startup does not provide documentation of each step and processes while using the methodologies. This helps reader to reflect own situation through each cases. Therefore measurement became a significant part of the Lean Start-up. Further in the thesis in the section 2.7.2, the Lean Canvas will be showcased in the context of sketching hypotheses, experimentation and validation.

Figure 5 Nathan Furr

Lastly, Nathan Furr (Figure 5), who developed a theory called as Nail It then Scale It (NISI), is an essential person because his work compliments the aforementioned literature and therefore is worth of mentioning. Nail It then Scale It offers alternative systematic way to increase the chances of success, by offering different evidence-based processes which lead to fact based conclusions.

All in all, as the Lean Start-up is the case of this thesis the other aspects are education, entrepreneurship and entrepreneurship education that have been chosen in order to examine the thesis topic thoroughly.

2 Literature Review

The literature review presents the theoretical framework, which starts from education. After the education, entrepreneurship, entrepreneurship education and Lean Start-up are reviewed in more detail. Furthermore literature review covers the terminology and lastly the part of research methodology.

2.1 Education

Before entering to a topic of entrepreneurship, education must be covered first. It has to be defined but also presented from a scientific point of view. Furthermore the point is to review different elements of education and ways of learning.

At first, the Finnish Concepts of Science of Education -book, Kasvatustieteen käsitteistö, defines education as a humane activity, which purpose is to create conditions of versatile development and growth for a human (Hirsjärvi, 1992: 72-73). Meaning that the environment allows a person to learn and try different things where s/he can develop and grow in terms of knowledge and skills by him or herself. In addition, it is an interaction between an educator and the one who is being educated where knowledge, skills and cultural heritage are passed on. Therefore education does not only include activities of self-development and growth but also an exchange of information between people. Education is also related to cultural and humane activities where its nature and qualities are determined by the structure of society and level of development.

In education there are two fundamental functions. First, it is a powerful institution that holds and preserves society together because with the education, cultural property is transferred forward to new generations. Secondly, education is a modernising institution because its key goal is to foster the fulfilment of individuality and uniqueness in every person, thus affecting the emergence of a new culture (Hirsjärvi, 1992: 73). These functions therefore help the individual and groups to plan ahead and think of different possibilities to survive, adopt and create in future environments.

Furthermore education includes terminologies such as schooling and teaching. Hirsjärvi explains that schooling and teaching have slight differences compared to education but they are both a significant part of it. Schooling is a concept of education that refers to a specific area of education, which is organised and institutionalised. The aim of

schooling is teaching knowledge, the training of special skills and development of cognitive skills. Sooner or later, schooling will end whereas education is on-going and lifetime process (Hirsjärvi, 1992: 95). To draw a conclusion, schooling means a school system we know today, that starts at the age of seven and ends at the age of eighteen for example in Finland.

Teaching is a supportive part of the education where learning through teaching turns into education (Hirsjärvi, 1992: 131). Furthermore teaching is intentional interaction of educational objective which purpose is to cause learning. As a first example, teaching is an interactional event located in the atmosphere of school that aims to foster students' personal development in terms of educational objectives. The second example is a regulation of environmental factors in order to change the behaviours of students through learning by setting goals. The basic model of teaching includes setting objectives, regulation of environmental conditions, expected learning and assessment (Hirsjärvi, 1992: 131).

Due to constraints where teaching and education have been attempted to defined in numerous ways the thesis does not cover more about the topic of education. In order to supplement education, we need to understand the ways of learning. The next topic is meant to cover this by introducing a theory developed by Knud Illeris.

2.2   Types of Learning

Education does not necessarily mean that something has been learnt. Meaning that the knowledge has been internalised and turn into applicable skill. Therefore it is important to understand the ways of learning.

Knud Illeris outlines four types of learning: cumulative learning, transformative learning, assimilation and accommodation. The nature of the learning stems from the psychology that the types of learning expresses. Illeris explains that during the learning there are both schemes and patterns. Schemes are structures in the brain that can be instantly tapped into unconsciously. Patterns are a systematic classification of topics or themes that are related and connected mentally.

The first type of learning is a cumulative learning where according to Illeris is a pattern or scheme. Cumulative learning occurs most frequently during the first years of life but

not in the later age except in special situations. Cumulative learning according to Illeris is similar to learning a PIN code or password. Cumulative learning can most commonly be related to conditioning which occurs with animal training. This type of learning is associated with behaviourist psychology (Illeris, 2009: 13).

Secondly there is assimilative learning, which is the most common type of learning. This means linking new elements by adding them to a scheme or pattern that is already established (Illeris, 2009: 13). Schools are places where assimilative learning happens because the curriculum are meant to add more information on top of the existing information, however, schools are not the only places where assimilative learning happens because it is taking place in all contexts where one gradually develops one's capacities (Illeris, 2009: 13). Learning by adding up new elements to the existing helps to easily recall and apply knowledge on things that are being oriented. Therefore the downside of the school is that it either fails to build a link between different contexts or it breaks it.

In contrast, there is a type of learning where one can acquire learning, understanding and experience regardless of having cumulative or accumulative learning by being determined. Therefore accommodative learning is a situation where one becomes determined when having interest or importance on something resulting in motivation. This type of learning can be demanding or painful because in the process one reconstructs something that is accepted as significantly new or different (Illeris, 2009: 13). However after the learning process is complete one has to internalise the knowledge, or take the effort to consciously process the information learned.

Lastly, the most profound and extensive type of learning is called transformative learning. Transformative learning occurs when one faces crisis-like situations that are caused by urgent and unavoidable challenge (Illeris, 2009: 13). Therefore it becomes necessary to change, even personally, in order to move further. From a psychological perspective transformative learning is the most mentally demanding form of learning.

In summary, the types of learning are general and simplified theories of Knud Illeris. However, the theories provide a wide scope of how people learn and therefore how things should be taught, because each type of learning is different. As the topic of this thesis covers entrepreneurship education it is important to review and define entrepreneurship.

2.3 Entrepreneurship

In order to understand entrepreneurship it is best to look at the meaning of entrepreneur. The origin of the term entrepreneur comes from the Irish-French economist Richard Cantillon.[9] Simply put; an entrepreneur bears the risk of having uncertain income whereas workers have assured income based on the definition of Richard Cantillon. According to the Oxford Dictionary, an entrepreneur is an individual who undertakes (from the French *entreprende* to undertake) to supply a good or service and take on the risks associated with the investment (Oxford Dictionary, 2009: 203). Furthermore based on the Oxford Dictionary entrepreneurs are regarded as an important element in creating a society's wealth. Due to the fact that entrepreneurs contribute to economic growth of the nation, governments are therefore led to establish conditions where entrepreneurs will thrive.

The definitions of the entrepreneur mentioned above are good starting points for the topic. But at Harvard University, Howard H. Stevenson has defined entrepreneurship as *the pursuit of opportunity without regard to resources currently controlled*.[10] The definition describes Stevenson's focus on the process rather than the person that follows specific steps towards becoming successful entrepreneur.

Shortly, there are several definitions about entrepreneurship that vary based on the school of thought. Stevenson explains that entrepreneurship can be roughly divided into definitions that have economic function or individual traits. For instance in the 18th century, Richard Cantillon said that entrepreneurship entailed bearing the risk of buying at certain prices and selling at uncertain prices. Later, Jean Baptiste Say included the factors of production to the definition and Schumpeter added the concept of innovation (Stevenson, 1999: 8). Therefore resulting entrepreneurship to become a synonym for risk bearer and innovator to some degree (Stevenson, 1999: 9).

2.4 The Dimensions of Entrepreneurship

According to Stevenson, entrepreneurship is both management style and behavioural phenomenon. Therefore they are both related to the concept of six dimensions of entrepreneurial management developed by Stevenson. The dimensions are strategic orientation, commitment to opportunity, commitment of resources, control of resources, management structure and compensation and reward policy.

The six dimensions of entrepreneurship are business practices that reflect behaviours in different categories. Stevenson uses a range of behaviour between two extremes that are completely on the opposite sides of the spectrum to help define the dimensions.[11] These extreme ends are "promoter" and "trustee". Promoter is a confident about seizing an opportunity regardless of the resources under current control. On the other hand, trustee emphasises the efficient utilisation of existing resources such as money or time for example. Therefore this is how entrepreneurial behaviour differs from administrative behaviour.

PROMOTER	KEY BUSINESS DIMENSION	TRUSTEE
Driven by Perception of Opportunity	Strategic Orientation	Driven by Resources Currently Controlled
Quick Commitment	Commitment to Opportunity	Evolutionary with Long Duration
Multistage with minimal exposure at each stage	Commitment Process	Single-stage with Complete Commitment Upon Decision
Episodic use of Rent of Required Resources	Control of Resources	Ownership or Employment of Required Resources
Flat with Multiple Informal Networks	Management Structure	Formalised Hierarchy
Value-Based & Team-Based	Reward System	Resource-Based; Individual and Promotion Oriented

Table 1 A Process Definition of Entrepreneurship. Original Picture: Richard J. Goossen, Entrepreneurial Excellence, p. 147

Table 1 shows the big picture of the dimensions of entrepreneurship where all of them have been listed in the middle column. Moreover the left column, which represents the entrepreneur, belongs to the part of the promoter. The right column is the side of the administrator that represents the trustee. In addition, below of the entrepreneur and administrator there are specific behaviours listed for each dimension that explain succinctly the main behaviours of promoter and trustee.

In conclusion, Stevenson gives a practical and visual definition for the theory of entrepreneurship by introducing six dimensions from the behavioural aspects of entrepreneurship. Due to a fact that the traits of entrepreneurs and employees are not the main topic of this thesis, it will not be covered further. Therefore entrepreneurship education is covered next, by examining how it is implemented in an academic world.

2.5   Entrepreneurship Education

2.5.1   Traditional Model of Teaching Entrepreneurship

Today, academic university programmes often follow a conventional way of teaching entrepreneurship. Entrepreneurship education consists of teaching entrepreneurial competences according to different university programmes descriptions.[12] The examples referenced from Lappeenranta University of Technology and Aalto University School of Business are meant to showcase that the traditional model of teaching entrepreneurship is still in use in education.

The competences taught are creation of a company, acting entrepreneurially, and managing and administrating companies in national and global context. The teaching in different universities often follows a pattern such as forming a company, writing a business plan, development of a business idea and managing the company for example.[13]

Forming a company begins with the steps of identifying different ways to trade under legal names such as Limited Liability Company, private trader and partnerships for example. Then it is about teaching how to use these different business entities in different business situations. In universities there are often courses covering company creation that are offered for students. In the course, students go through the basics of forming the company.

Teaching of how to write a business plan is due to a fact that it is a common tool for entrepreneurs, investors and public officers who grant start-up money for example. With the business plan, entrepreneurs are able to raise funding and investment whereas investors can see if the business is worth investing in. Therefore business planning is part of the academic entrepreneurship education because of its relevancy. The purpose is to lay down a business idea, a product, SWOT (strength, weaknesses, opportunities and threats) analysis, financial statements and profitability calculations in one document.[14] For example making of the financial statements and profitability calculations are taught separately in finance and math courses across universities. These courses support managing of the business in addition to SWOT analysis, marketing strategies and others courses that are relevant for running businesses.

Development of a business idea is essential part of the teaching because it likely generates new innovations through new products and services. Moreover, business ideas are taught to students by writing ideas down into the business plan document. The content explains what the product is, who are the customers and what are the different ways of selling them. Because there are many differences in teaching on how to generate ideas and develop them, it is one of the constraints that therefore will not be covered further.

2.5.2   The Lean Start-up in Entrepreneurship Education

After it has been realised that the traditional method of teaching entrepreneurship does not generate as much innovative results as expected, a new method has been adopted in hopes of increasing the likeliness of getting better results. The new method is called as Lean Start-up that offers more systematic and customer centric approach to entrepreneurship.

In past few years Steve Blank has developed a course using the approach of the Lean Start-up methods because he argues that writing business plans is obsolete. Blank says that start-ups are not meant to execute a plan where the product, customers and channels are known because they are temporary organisations to search for a repeatable and scalable business model.[15] Therefore he started a class called Lean LaunchPad at Stanford University where students are meant to develop and build a viable business concept in two months. The Lean LaunchPad course will be used as an example to explain how the Lean Start-up method has been applied and implemented in the entrepreneurship education compared to traditional model of entrepreneurship education.

The whole course can be separated into nine parts that consists of different activities based on a business model canvas (covered in section 2.6.1) that Blank uses as a framework for building businesses. Teams will also get mentors that are assigned to work as the their advisors at least every two week. In addition, the students need to write a blog about their findings and explain changes that have occurred from the beginning to the end of the process. In the end of the course, each team gives a final presentation about their Lean business model.

Based on the Lean LaunchPad, the entrepreneurship course start with an introduction to a business model canvas and sketching hypotheses. Moreover business ideas are generated and brainstormed in the beginning. When the idea is clear enough the team must identify a problem that their idea is solving. This is due to a fact that it helps them to sympathise with customer's pain. By sympathising with the customer and identifying the problem the team can determine their potential target customers.

The team will need to simultaneously validate their hypotheses with real customers about problems and solution for example. According to customer feedback the team will make changes and come up with new hypotheses. With closer customer contact the team can build a better value proposition for their solution.

When finding the right problem that needs to be solved and customers who need the solution, the team start to work on activities that are meant to increase the customer base. Channels are meant to increase sales by finding the right place to sell the solution that has turned into a product or service. Further steps in the course are creation of a revenue model and cost structures.

At the same time when all parts of the business model are being tested the team often builds a minimum viable product (covered in section 2.6.4), also known as MVP. The MVP has the smallest set of features in order to save resources, time and money. In addition, the MVP with the small set of features can test the most crucially wanted features that really need to belong to the solution in order to be purchased. When all of the steps have been gone through in two months, the teams give the final presentation about their start-ups as mentioned earlier.

To conclude, students learn the basics of searching and building business models in the courses where the Lean Start-up is in entrepreneurship education. As the three elements, 1) business model canvas 2) customer development 3) agile development, often create the main principles of teaching Lean Start-up in education, it is essential to cover them more closely in the next topic: Case: The Lean Start-up.

2.6   Case: The Lean Start-up

2.6.1   Sketching Hypotheses

First, the Lean Start-up is about testing hypotheses that are guesses that entrepreneurs make, such as who their customers are, what are the features and services that the customers want. In order to test hypotheses, Lean Start-up use a "get out of the building" approach called customer development to receive feedback on all elements of the business model from potential users, purchasers and partners (Blank, 2013: 67). The elements of the business models contain key partners, revenue streams, distribution channels and customer segments to name a few. The elements are from Business Model Canvas (Figure 6) which is a canvas concept developed by Alexander Osterwalder and Yves Pigneur (Blank, 2013: 66).

However, the Lean Canvas (Figure 7) by Maurya is adapted from the Business Model Canvas and differs by having elements of problem, solution, key metrics and unfair advantage instead of key partners, key activities, key resources and customer relationships. This is due to a fact that Maurya emphasises that premature building of the solution and picking of a customer segment can lead to a waste of time if they are untested (Maurya, 2012: 23). Therefore the Lean Canvas has been chosen to act as the main framework of the business model.
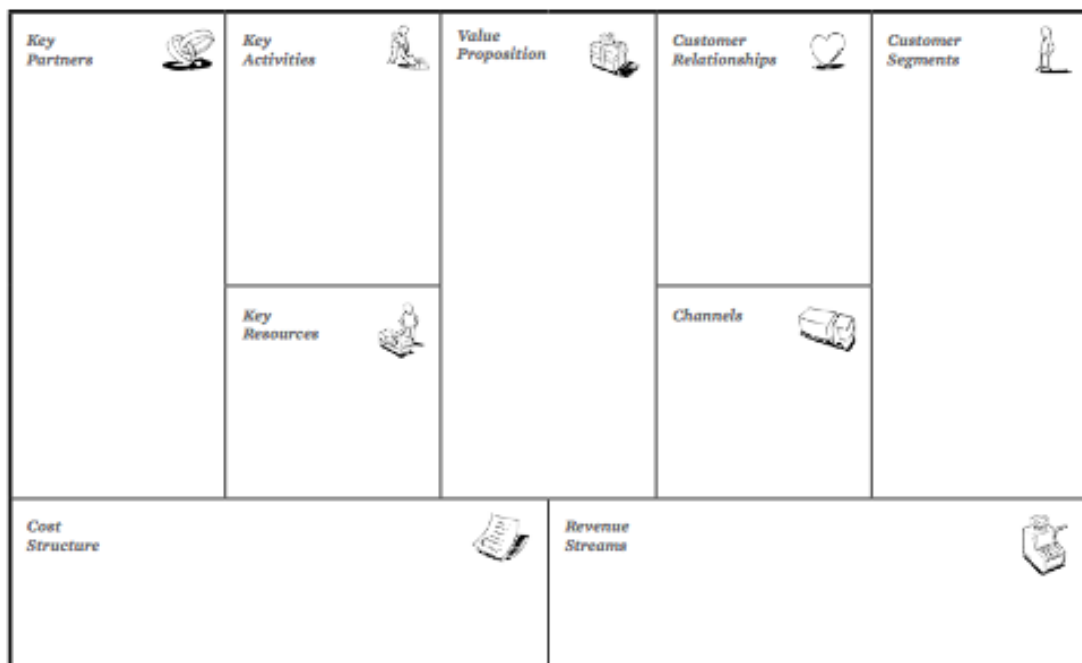

Figure 6 Business Model Canvas (Osterwalder, A. & Pigneur, Y. 2010)

In practice, the canvas provide a standard framework for start-ups, entrepreneurs and large companies to sketch out their hypotheses and go out, test them and come back to make improvements. The process of using the canvas starts from brainstorming possible business models that help to prioritise where to start and track on-going learning (Maurya, 2012: 23).
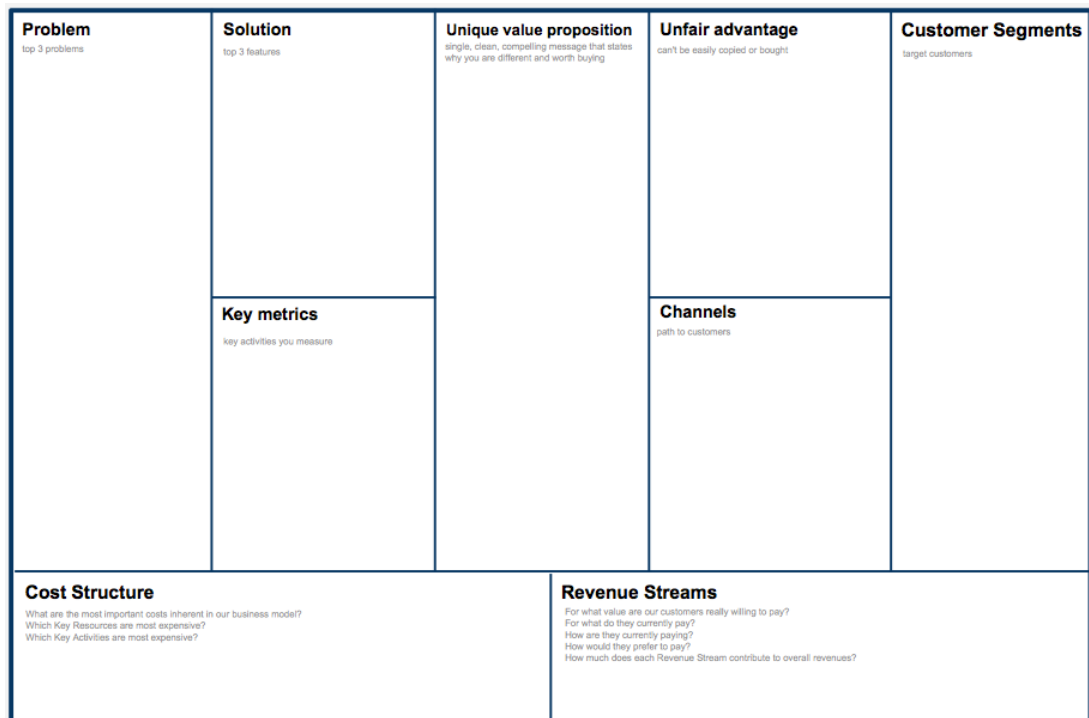

Figure 7 Lean Canvas (Maurya, A. 2012. p. 5)

Maurya tells that hypotheses are meant to sketched down on the canvas in one sitting where the purpose is to avoid endless iteration of ideas (Maurya, 2012: 26). Moreover the point of creating a canvas is to take a snapshot of what is your head at this moment in time, move on to identify the risks and finally get out of the building and test the model with other people (Maurya, 2012: 26). According to Maurya it is alright to leave sections blank too because that helps to identify what are the riskiest parts in the business model and the canvas is meant to be an organic document that evolves with time (Maurya, 2012: 26). In addition, he emphasises to be concise by describing something in a single sentence instead in a paragraph. This will distil the business model down to its essence (Maurya, 2012: 26). Furthermore sketching the canvas further, it is important to note that a customer-centric approach must be kept in mind because tweaking the customer segment can completely change the business model (Maurya, 2012: 26).

2.6.2   Customer Development

As Maurya highlighted, the customer-centric approach in the end of previous section, the second key principle of the Lean Start-up is on the customer development (Figure 15) developed by Blank. The purpose of customer development is to validate assumptions by doing grass root work with close customer contact. Blank emphasises close customer contact with a saying "get out of the building" in order to get the message across (Blank, 2013: 67). The method is highlighted mainly for start-ups even though the method is applicable for large corporations and organisations.

In the customer development the main task is to search for a business model that works. The customer contacts provide feedback that reveals if the sketched hypotheses are right or wrong. Depending on the situation, start-ups iterate, pivot or continue according to the evidence. Iteration means a small adjustment or failure after realising that the hypothesis is not true. There will be several failures before finding the right approach. Pivot is a major change where there is enough evidence to prove a hypothesis completely wrong so that everything must start from the customer discovery as depicted in the Figure 15.
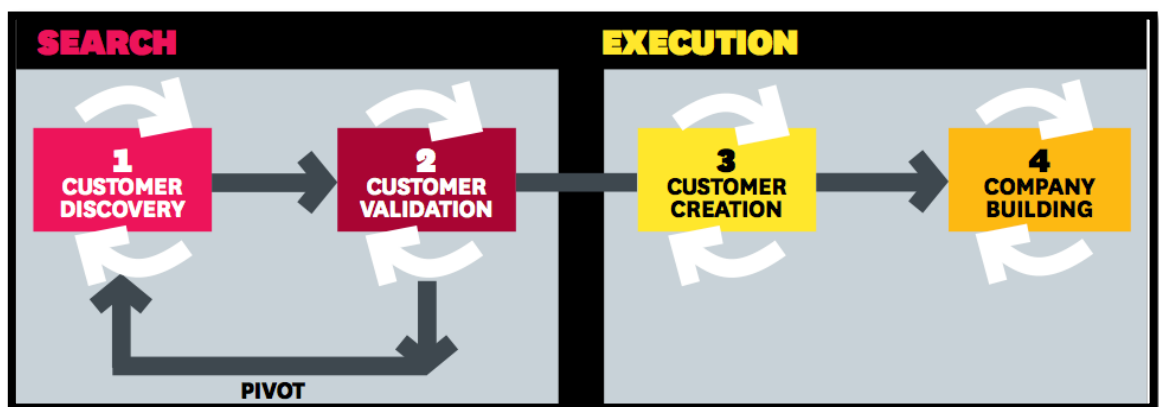
Figure 8 Customer Development Model. Original picture: Steve Blank. HBR, 2013, 68

In more detail, the customer development consists of four stages that are customer discovery, customer validation, customer creation and company building. First, the point of the customer discovery is to brainstorm possible business model hypotheses using the canvas for instance and test them with customers in order to identify their needs. Emphasis is on the problems of the customers and finding potential solutions by

learning about their needs. Moreover the creation of a minimum viable product (section 2.7.5) and trying it out again with customers is part of the customer discovery.

Secondly, the customer validation continues from the remaining hypotheses that are meant to validate the interests of customers through early orders, purchases or usage of the products. The amount of orders, purchases or usage indicates if there is a market for the specific solution. If no then a start-up, company or an organisation can pivot by changing the hypotheses that did not work (Blank, 2013: 68)

After completing the first and the second stage, the third stage is refinement of the product to a point where it is enough to be sold. Moreover the demand of the product will be build with a marketing and sales effort in order to scale up the business (Blank, 2013: 68). At this point the business is in a condition of repeatable operations (Cooper & Vlaskovits, 2010: 9).

The last stage is about the transition from the start-up to a company where departments and operational processes are created to support the scaling (Cooper & Vlaskovits, 2010: 9).

As Maurya states "Business plans try too hard to predict the future, which is impossible (Maurya, 2012: 26)." Therefore by understanding the meaning of customer development, we increase the likelihood of building successful businesses because it helps to minimise the risks by eliminating assumptions. After reviewing Customer Development, the last section covers the third element of Lean Start-up, which is known as Agile Development.

2.6.3   Agile Development

Third key principle of the Lean Start-up according Blank is an agile development. Agile development has originated from the software industry that works hand-in-hand with customer development (Blank, 2013: 67-67). The purpose of the agile development is to eliminate wasted time and resources by developing product iteratively and incrementally. Therefore agile development is in contrast to the traditional product development where it can take many months and years to build a product. Furthermore traditional product development works in a linear model whereas agile development in short, repeated cycles.

In detail, agile development can be illustrated with the Figure 15 that start with initial planning and moves to requirements, analysis & designs, implementation, testing and evaluation. And every time when the cycle hits the testing phase the start-up deploys a minimum viable product in order to generate customer feedback. Many more cycles follow after completing the first cycle.

The development goes in short and incremental cycles and not in linear way. This is due to a fact that with smaller cycles the resources and time can be saved because there is no big investment when building them. Furthermore, when the start-up will build

Figure 9 Quick and Responsive Development (Blank, S. 2013 p. 72)

a minimum viable product (covered in section 2.7.5) it should only contain critical features and gather feedback. The development continues by revising the minimum viable product based on the feedback and the cycles continue until the product reaches the mass market.

2.6.4 Build – Measure – Learn

At the core of the Lean Start-up is the Build – Measure – Learn feedback loop (Figure 10), developed by Ries. The reason why Ries developed the diagram was to minimise the total time to get through the fundamental activities of a start-up. These activities are turning ideas into products, measuring how customers respond and then learn whether to pivot or persevere (Ries, 2011: 9). Fur-
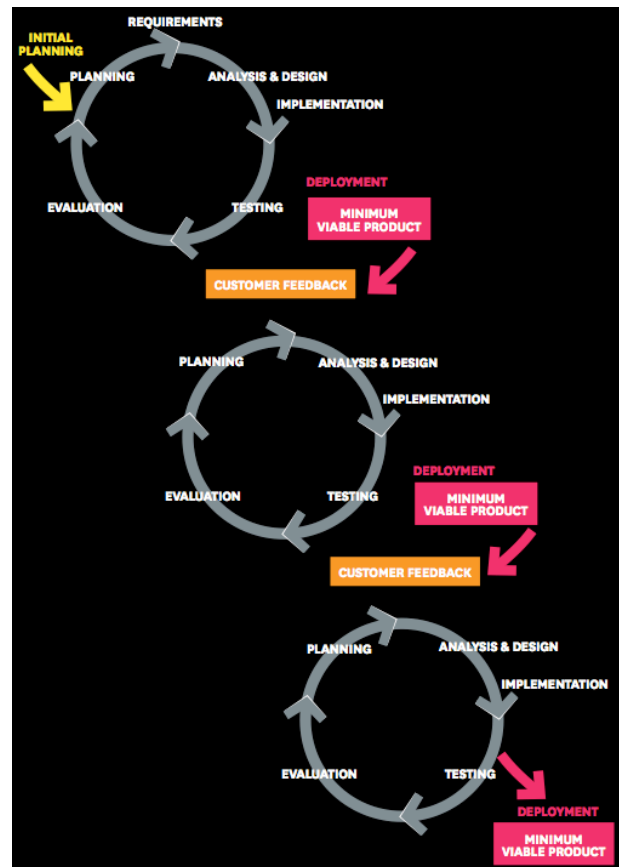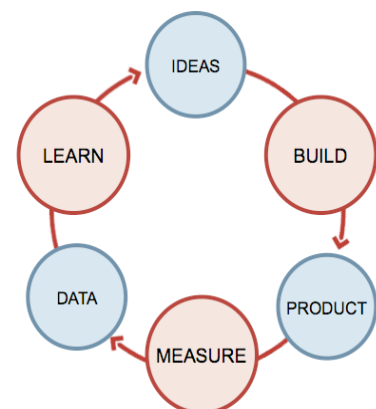

Figure 10 Build - Measure – Learn Feedback Loop (Ries, E. 2011. p. 75)

thermore learning where and when to invest energy results in saving time and money. Before moving to the Build phase there needs to be Ideas because it needs hypotheses in order to have something to validate. Build is the first step of the feedback loop where Ries emphasises to enter the step as quickly as possible with the minimum viable product (abbreviated as the MVP further on). Ries defines the MVP as a version of the product that enables a full turn of the Build – Measure – Learn loop with a minimum amount of effort and the least amount of development time (Ries, 2011: 76-77). Moreover MVP lacks many features that may prove essential later on (Ries, 2011: 76-77). However when creating the MVP there must be ways to measure its impact and therefore it can create extra work (Ries, 2011: 76-77).

The measure phase is following a progression of efforts whether it is a product development or sales. One of the tools to measure the progression is learning milestones. Learning milestones are an important part of the measuring phase because they help to assess progression accurately and objectively (Ries, 2011: 77). It also helps to keep each member of a start-up accountable if there are no results. This helps start-ups to face their actions directly rather than dismissing the problem of not having progression. Measure phase then generate data that help to assess the next step, which is the Learn phase.

Lastly, Learn phase is about choosing whether to continue with the current strategy or pivot. Choosing the pivot means that the hypotheses is often wrong and the strategy needs a major change and choosing a new hypotheses. But it is up to start-up to choose to continue forward and find alternatives. Otherwise the strategy needs to be altered in order to find a better strategy to target another customer segment for instance. However the data received through building and measurement must take into consideration because start-ups cannot change their strategies if it is just based only on hunch and gut feeling.

All in all, following three steps of the Build – Measure – Learn loop help to de-risk the building of the business model by cutting the time to market in half. Furthermore the process helps to limit the spending of resources and money with MVP that contains only the most critical features that are targeted to meet the needs of customers. Measuring results and time frames keeps everyone involved accountable of their actions.

3   Research Methods

The aim of the thesis is to present the alternative ways of teaching and educating entrepreneurship that shows the best practices that have been implemented around the world. Furthermore the aim is to research whether entrepreneurship can be taught effectively, and if so, is the method of Lean Start-up more effective compared to the traditional model such as business plans.

3.1   Research Design

Firstly, the exploratory research design was chosen rather than the descriptive research or causal research approach because the emphasis is on the discovery of ideas and insights of the individuals (Churchill & Iacobucci, 2002: 91). Descriptive research design is concerned with determining the frequency between two variables (Churchill & Iacobucci, 2002: 91). For example what is the trendiest mobile phone brand among different sex, age or geographic location. The causal research design focuses on determining the relationship of cause and effect (Churchill & Iacobucci, 2002: 91).

When these three types of research designs are compared, the relevance of the exploratory research rises because there is a need to understand the core problem of how entrepreneurship can be taught? The most likely way to answer this question is through qualitative research, and more specifically, individual depth interviews that provide insights and information that are not accessible in any other situation.

For the research, the individual depth interviews generate primary data and secondary data have been collected through different literatures, articles and news. Other intelligence is from qualified observations such as related events and developments.

3.2   Qualitative Data Collection

Before collecting data, the identified groups are educators, students and Lean Start-up practitioners. The separation into different groups is due to a fact that the aim is to get specific opinions with targeted questions. For example getting known to how entrepreneurship has been perceived in the other universities in the Helsinki and Uusimaa region. Moreover the interview has been built based on the categories of the groups that

cover five parts. Questions and topics discussed change according to the group, which is being interviewed. Interview questions have been built based on the literature review. Interview questions can be seen in the appendices 1-3.

In total, nine people responded to the call of individual depth interviews. The Lean Start-up practitioners were from Finnish companies. Taneli Tikka - Head of Industrial Internet at Tieto Oyj, Juha Vakkila - Business Developer at Fonecta Oy and Ola Sundell – An Entrepreneur and CEO at HUB13 Oy were represented in the interviews. Lecturers were from universities or university of applied sciences. Erto Örnberg - Head of Education at University of Helsinki, Timo Nyberg - Research Director at Aalto University and Katri Ojasalo - Director of MBA Programmes at Laurea University of Applied Sciences took part in the interviews.

All the students who participated in the interviews were from Metropolia University of Applied Sciences. The main reason being the need to know how they feel entrepreneurial mind-set and activity in the particular university. Christophe Buyle studies International Business and Logistics programme, Jason Selvarajan is a graduate from Environmental Engineering programme and Juho Koskivuo, a fourth year student of European Business Administration programme.

3.3   Reliability

The reliability of research results comes from their transferability across populations and time. Research methods can be considered reliable when the procedures can be replicated and the results achieved are similar as the original conclusions (Lehtinen, 2012: 30).

Today Lean Start-up is still a new method and concept that is being explored in Finland and therefore there is lack of previous research available. Due to absence of related data, statistics and studies it is hard to compare this thesis in order to ensure the reliability. This is why more similar researches should be made in order to strengthen the results but also ensure the reliability of the research too.

Because the primary data is collected through interviews it is possible to determine the specific target group and exact number of responses that increases the reliability of the thesis.

3.4 Validity

Based on Quinlan (2011, p.75), "in order to be valid, a research project must make a contribution to knowledge. The evidence gathered for research project must be valid." This research will ensure the validity by taking responders with specific range of backgrounds. The data will be then formed into results that are readable, reasonable and logical.

3.5 Limitations

The main limitations of the thesis are data collection, amount and quality of data and lastly time. Furthermore all three limitations are interdependent in the process of the research.

The data collection is regarded as a limitation because the size is small due to research method, which is interview. In addition, the target group chosen consists of people who have knowledge sought. People with specific knowledge that are needed for the research are challenging to access because they are rare. This brings certain type of limitation as well to conduct interviews even though each person who has participated in the interview has been contacted directly.

The second limitation is the data that is interdependent on the knowledge sought from the targeted sample. Moreover the amount of targeted sample is limited in size and that can affect the results of the research because they cannot represent the whole population. Furthermore the quality of the data received from the interviews can vary according to the familiarity and expertise of the research topic. However, familiarity and expertise are not required from all the target groups that are taking part of the interviews for example the students.

Lastly, time is a limitation that is needed in order to collect the data. However interviews take less time than analysing the data received and interpreting the results. After that compiling all the results for the research takes time too. It is important to note that sometimes interviewees can be busy that naturally affects the completion of the thesis.

4 Results

4.1 Background Information

The Background Information contained basic questions about the responders such as the company they work for and whether they attended an entrepreneurship course during their studies (see appendices 1-3) or not. Lean Start-up practitioners Juha Vakkila (Director, Online Development, Fonecta Oy) and Ola Sundell (CEO, HUB13 Oy) were not aware of entrepreneurial courses during their studies. Meaning that the school might have provided entrepreneurial courses but both were focusing on their studies. Juha Vakkila studied in EVTEK, today known as Metropolia UAS and Ola Sundell at West London University in London, United Kingdom. However Taneli Tikka (Head of Industrial Internet, Tieto Oyj) studied in Helsinki School of Economics, today known as Aalto University, was aware of entrepreneurial course during his studies. In addition, it is important to note that Tikka has served many startups and is a known serial entrepreneur in Finland.

The name of the course that Tikka attended was called "Risks and the analysing of companies". The course was not compulsory for students and Tikka did not complete the course. The purpose of the course was to research and examine entrepreneurs and entrepreneurship like in the laboratory. In his view, the content was about "wondering how funny and silly entrepreneurs are due to high risks that they are willing to take". Moreover, Tikka commented that the orientation of the course was not about teaching skills and knowhow that are necessary for becoming successful entrepreneur.

In short, all the university lecturers teach or have taught entrepreneurship. In detail, Timo Nyberg (Research Director, Aalto University) and Erto Örnberg (Head of Education, University of Helsinki) still teach entrepreneurship courses at their schools. However Katri Ojasalo (Director of MBA Programmes) does not lecture anymore but has taught entrepreneurship in her service innovation and design course (SID) previously before her promotion. Due to the background of teaching entrepreneurship, Ojasalo is eligible to continue in the interview without a need to jump straight to the section of "Gaps of Entrepreneurship Education".

Nyberg teaches three courses at Aalto University. The courses are Software Venture management, Intellectual Property Rights (IPR) Strategies and the Internationalisation of a Growth Company. Moreover all the courses are elective and in total 100 students participate the courses. Software Venture Management covers all the necessary activities that are compulsory to know in the business management. Intellectual Property Rights (IPR) Strategies focuses on a growth company, IPR strategies and the earning model of the IPR and patents. The Internationalisation of a Growth Company course goes through all the typical theories of internalisation, ending with the concept of "Born Global".

Erto Örnberg runs a "Creative Academic Entrepreneur" (Luova akateeminen yrittäjä) course two times in a year that began in 2011 at the University of Helsinki. The course is an elective four-credit course that has multidisciplinary students from different study programmes. Based on the past results, 90 people choose the course and 50 people are taken in. Approximately 35 people complete the course. The biggest reason for the dropout rate is due to the sign up system because students have to register on many courses simultaneously and naturally courses will overlap. The mission of the course is to demonstrate that the education and expertise of student's can be utilised in companies. Moreover the second mission is to show that there are entrepreneurial opportunities existing.

Officially there is only one entrepreneurship course at Laurea University of Applied Sciences (UAS), which Katri Ojasalo is not teaching. This particular course is not compulsory but there are 20 students per semester who complete the course. However entrepreneurship has been included in many Laurea UAS courses. For example entrepreneurship has been integrated to a Service Innovation and Design course starting from the basics such as the importance of an attitude to the forming of business ideas. The most important elements taught at Laurea UAS are entrepreneurial attitude and intrapreneurship. Moreover there are exercises about building business models with canvases and writing business plans. With that education, students have potential to work entrepreneurially in large companies or even establish their own company says Ojasalo.

As regards students, Juho Koskivuo (European Business Administration) is the only student who has not taken any entrepreneurial courses. Due to this, opinions of Koskivuo will not be covered further, but he makes an appearance again in the part of

"Gaps in Entrepreneurship Education". However Christophe Buyle (International Business and Logistics) and Jason Selvarajan (Environmental Engineering) have participated in entrepreneurship course at Metropolia UAS known as Startup Challenge and therefore their interview results are covered throughout the section of "Results". According to Buyle and Selvarajan, the course was elective.

The Startup Challenge course was the only entrepreneurship course for Buyle and Selvarajan. According to Selvarajan, there were approximately 30 students during his course in the beginning and ten students who completed the course. Buyle says that about 30 students participated, and then it decreased significantly at the end of the first semester to 20 people. Eight people were present during the last class and one group of four students pitched their idea at the Start-Up Challenge Competition. They won the award of the best presentation.

Buyle said that the purpose of the course was turning an idea into a business while having introduction to the Lean Start-up, business plan, Business Model Canvas, Minimum Viable Product, pitching and blogging. Moreover students had the opportunity to establish a company free of charge during the time of the course and beyond. But the focus was not put on this part but rather on the business model development and building the Minimum Viable Product.

From Selvarajan's perspective the purpose was to sell the idea fast and learn the right business model by constantly changing the product according to feedback. When these learning methods are followed, it should help to sell the idea and start a business. Lastly, the concept of Minimum Viable Product helps to understand that the product does not have to be ready.

4.2   Entrepreneurship Education in detail

According to Taneli Tikka, there was a pattern in entrepreneurship course where implementation happened around business planning, risk assessment, filling a form to establish a company and a form for bankruptcy, in case of a need. Therefore the course focused on bureaucratic activities and duties of entrepreneurs that were secondary. The longest courses lasted for four months that was worth about five credit points in today's school.

Things that did not bring value in the education were the theories about the leadership and planning of processes because they were taken from industrial companies due to industrial revolution. Moreover the school's arguments to teach above topics were because of the fact that the companies that were successful had planned their core processes better than average companies. In addition, companies that were used as role models and case studies were mainly family businesses that had a long history e.g. Rapala VMC Oyj, Polar Electro Oy and Vaisala Oyj.

The most useful and beneficial method used during Tikka's studies was "Value Driver Canvas" because it focused on customer value, development and experimentation. Value Driver Canvas is a tool to make an analysis about the sector's activities where it is operating and trying to figure out what are the issues that drive customer value in the sector. For example using Value Driver Canvas in airline business it is possible to analyse what factors drive customer value e.g. good seats, foot space, good service, fast flights etc. When these customer values have been identified, the business can be planned in the way that some values will be minimised and some values will be maximised, therefore creating different type of businesses in the same sector. The two opposite ends of the spectrum are Southwest Airlines and Virgin Airlines for example.

Moving on to the lecturers, Nyberg's course consists of an assignment, lectures and guest lecturers. In the assignment, students have to plan actions for their exercise and implement them or at least plan the implementation of their actions that are necessary in order to launch a business. The courses last a maximum of six months and they vary between three and six credits. Moreover the heaviness and lightness of the course depend on how many credits students receive. The more credits students get the lighter the course has been Nyberg says. Reasons for this finding can be the high motivation of students where the learning has been internalised. Lastly, Nyberg has named Erkko Autio (Finnish author and professor at Imperial College London), Steve Blank (professor at Stanford) and Tom Bayers (professor at Stanford) as the role models of Aalto University courses.

At the Creative Academic Entrepreneur course, Örnberg covers intellectual property rights (IPR), marketing and internationalisation topics. The main focus of the course is the creation of a business idea, which is emphasised throughout the course. Furthermore practicality is brought to the course by the following steps such as: team building, development of an idea, Lean Start-up, social media, funds, finance, IPR, "How to go

Market Plan" and pitches. In addition, the Creative Academic Entrepreneur is a four-credit course and the intensity of the course correlates with students' motivation because the progress itself takes place during students' free time. Örnberg tells that there are not many role models because the purpose is to bring as much practicality as possible. Some of the practicalities have born from the public system such as Patent and Registration Office, patents, laws and IPR. The most common practical approaches are the Lean Start-up, customer experimentation and tests.

In the MBA courses at Laurea UAS, the emphasis is on networking because it has had the most beneficial results for students according to Ojasalo. Through networking students can create a new network of acquaintances that give the possibly to build companies. The amount of credit is either five points in an English course and 10 points in a Finnish course. The theories used in Service Innovation and Design course taught by Ojasalo is Customer Dominant Logic, which is a concept of approaching entrepreneurship. The role models behind the Customer Dominant Logic are Päivi Voima and Kristina Heinonen.

In Nyberg's course assignments at Aalto, the aim of the students is to interview 1-2 companies. The companies operate in the industry the students are targeting, because the companies are potential customers. The main purpose is to receive feedback and train students to be in natural contact with customers. Nyberg thinks that this approach functions better because the most dominant form of action is "a technology push" that resort on own expertise that should be sellable. Instead, the customer contact increases unquestionably the success of a company because students start to understand the importance of listening.

Örnberg has implemented the same approach as Nyberg regarding the customer contacts. In the University of Helsinki, teams have had a lot of customer contacts that got good reactions from both students and companies. Therefore Örnberg thinks it is a very functional method that makes studying more interesting and practical while attracting new students. Örnberg states that the more practical the course is the more interesting it becomes. For example the exercise work that is one of the core elements, has received a lot of good feedback. This exercise work includes the ideation, marketing, Lean Start-up, a final pitch and a written assignment. The written assignment is like a travelogue from the start to the end of the course that can be implemented in anyway students like. However business planning is also part of the course because Örnberg

believes it teaches calculations and important equations that are essential to know how much one has to earn to in order to be profitable.

As Ojasalo's course start from the Customer Dominant Logic, it continues to the concept of Business Model Canvas. When the Business Model Canvas has been reached, the tool itself is developed further together with students and lecturers. By doing so, it creates results that raise interest, excitement and activeness among students. Therefore many students took part in events and competitions such as the Business Model Competition Finland 2014. And from the beginning it has been the strategy to educate students to be proactive themselves in order to force them out of the leadership of the teacher and make the teacher the facilitator.

From students' perspective, both Buyle and Selvarajan remember the Startup Challenge being a combination of lectures, business development and hands on learning. Furthermore Buyle says that students were made aware of his/her responsibilities and pushed to go high and further. But in Selvarajan's opinion, the course was light and easy in terms of how easily he received many credit points even though it lasted one year. Students could get up to ten credits according to the work achieved during the year. Selvarajan received seven credit points and Buyle received ten credit points.

Buyle remembers that existing companies and start-ups who lectured in the course were the role models in the Startup Challenge course. Selvarajan says that guest speakers were partly role models of the Startup Challenge course. Any particular names were not given because the course was many months ago.

Theories that Buyle used were a combination of the Lean Start-up, the business model canvas and a numeric diary. In addition some other theories were discovered in incubators and start-up events. Selvarajan replies that the most common method used was the Business Model Canvas that covered quarter of the whole course. The course also included some playful activities.

4.3   Gaps in Entrepreneurship Education

Tikka argues that one of the gaps is showcasing old successful companies that do not teach entrepreneurship at all. However entrepreneurship can be taught when there is a different perspective and curriculum. Firstly, there must be a combination of different

types of functional methods that directs the activity to the right direction while developing things fast and iteratively at the same time. In practice there has to be an existing methods such as Lean Start-up or Customer Development that can be used according to specific situations. Secondly, there is a need to emphasise the importance of teams in order to get team members interact among each other and get significant results. Based on Tikka's experience, many companies fail because the company do not get people act in the way that they need to in order to get results or they get results but do not function well together.

According to Tikka's opinions, gaps in entrepreneurship education are the lack of personal interaction and validation of the visions and ideas of entrepreneurs. The personal interaction is related to companies that have wrong people focusing on wrong things. Furthermore if personal interaction is not brought up, then people start to quarrel together because there is no interaction and teamwork. Thus, things start falling apart. Moreover things will fall apart when people cannot handle their pressures. Lastly, the lack of validating ideas and vision is related to the Lean Start-up because companies rarely succeed unless they systematically validate.

Because Juha Vakkila and Ola Sundell did not have entrepreneurship courses during their studies, their views are covered now. From Vakkila's point of view, entrepreneurship can be taught only if it is a right person. But if it is a wrong person then nothing is going to change his/her mind-set. Some people become entrepreneurs because they have grown to the same mentality when parents have been entrepreneurs or s/he wants to express freedom. Moreover becoming an entrepreneur requires passion and will. Only then education and literature can help e.g. a passionate product manager to become more entrepreneurial.

On the other hand, Sundell comments that Entrepreneurship can be taught but there is a lack of right focus. In entrepreneurship education, becoming an entrepreneur is emphasised too much instead of innovating new products with customers, according to Sundell. In addition, practical courses are too entrepreneurial where the goal is to manage a company. In the other words, theoretical courses focus on how "in theory" an idea is commercialised and suddenly becomes a successful hit. Therefore more focus should be put on how to innovate, productise and commercialise through processes that includes continuous testing and deployment of an idea and a product.

As regards the gaps in entrepreneurship education, Vakkila shortly answers that it is the lack of seriousness. Many courses are too playful and real tasks are not done like in a real life product/service experiments and tests with customers. Vakkila implies that students need to figure out themselves what they want to do instead of getting assignments and tasks from teachers. Inspiration and mission has to be born from the group itself. Sundell argues that the gap in entrepreneurship education is the lack of innovation, how it is created and developed. Shortly, entrepreneurs need to learn if their ideas generate traction and engagement among target customers. Furthermore, based on the feedback that have been received from the customers, entrepreneurs have to come up with solutions that could improve their ideas.

All three lecturers agree that entrepreneurship can be taught. From Nyberg's point of view entrepreneurship can be supported with information and knowledge. For example it is important that young adults know that there is a concept known as "product management portfolio" method that help to control and manage products in a company. Örnberg tells that entrepreneurship can be taught to some extent and even must be taught. But that doesn't mean that there are people becoming entrepreneurs willingly. As Örnberg says: "Education offers opportunities and networking". Moreover it is also about building teams. The way that entrepreneurship can be taught, according to Ojasalo, is by giving readiness and lowering the threshold to become an entrepreneur. This would then help the best candidates to receive tools and network in order to become entrepreneurs. But as repeated, nobody becomes entrepreneur even by teaching infinitely.

Everyone agrees that there are gaps in entrepreneurship education. Nyberg argues that one of the gaps is the lack of realism in ordinary entrepreneurship. Many easily dream about the success stories even though the chance of becoming a millionaire is one out of a million. For the University of Helsinki, entrepreneurship is still a new concept and therefore it is still an unknown territory according to Örnberg. For example there are arbitrary courses about it in different campuses. Furthermore attitude towards entrepreneurship and its practical implementation should be improved because the common thought is: "entrepreneurship does not belong to the university". This thinking strives from the status of being a research university. Ojasalo states that entrepreneurship education is obsolete when compared to the concepts such as Lean Start-up, customer development thinking and customer dominant logic. Today, the traditional thinking starts from technology or expertise that is being pushed to the market therefore

forgetting the real need and demand. And when lecturer's expertise is out-dated, the result will be a bad and negative stereotype about entrepreneurship. The big gap is to get teachers to update their teaching and the model of thinking to the new level.

Buyle's opinion about the functionality of the entrepreneurship education reflects several purposes that improve the quality of education. The purposes are creation of a business, understanding the needs of a company, improving communication skills and making strategic decisions to name a few. In Selvarajan's opinion there should be more mentoring and coaching. More concretely, Selvarajan wished to work with a coach in order to get in contact with a first customer. Furthermore Selvarajan points out that there were no resources to buy parts for prototypes or get funding. He also wished to have more freedom to work at school. But the course helped him to view things more commercially. He also learnt terminology and the art of saving time.

Due to the lack of completing an entrepreneurship course, Juho Koskivuo was not covered in the part of "Entrepreneurship Education in more detail", but will be included again from this section forward. Koskivuo thinks that the gap is the Finnish mentality where becoming an entrepreneur equals massive risks and high probability for failure. Environment of the school reflects the same mentality according to Koskivuo.

Buyle thinks that the gaps in entrepreneurship education are shortness of the course and the big amount of time that is needed for the assignments. Moreover, entrepreneurial course should be compulsory and part of the curriculum and more effort should be put on creating assignments that are real projects. As an example, the real project would be a collaborative project where companies give assignments for students while mentoring them.

Jason Selvarajan: "Entrepreneurship should be taught during the first courses in order to students to discover the opportunity to become an entrepreneur earlier. In addition, students should understand that they could develop their own ideas during the studies. However the permission to test ideas is still missing."

4.4   The Lean Start-up

The Lean Start-up is familiar to all Lean Start-up practitioners and the level of knowledge varies between good and great. Furthermore they have taught Lean Start-up methodologies and principles at their companies and therefore agree that it can be taught.

Today, Tikka teaches Lean Start-up methodologies and principles at Tieto Oyj. In detail, the teaching includes the understanding of the significant difference between unknown problems and badly defined problems because writing a document or instantly solving the problem cannot fix the problems. In a nutshell, teaching covers 1) Thinking 2) Practical Processing and 3) Wrong optimisation of tasks. The three points are meant to impact on how the thinking differs from other types of thinking because sometimes peoples' thinking are stuck and therefore need to be identified. Teaching Lean Start-up also requires the presence of the teacher and practical cases in order to build experience. Without any experience, it is hard to identify and see how to apply Lean Start-up in different situations.

Vakkila's approach on teaching Lean Start-up at Fonecta Oy starts from practical actions. Then the next step is to use Lean Start-up literature as a support to educate employees to internalise the Lean Start-up methods. Vakkila does not recommend reading the book before doing because there is a crystal clear difference between people who apply the method and those who "go by the book". First example is a test where the mission is to launch a product and launch it in two days. Employees who have internalised the Lean Start-up methods will often get good results. The second example is an activity where Vakkila puts a lot of pressure on his team, which mission is to test products and gather intelligence and data in order to find the right market fit. To do so the team has to take big and conscious risks, too, that can mean the decrease of the profits. But the ultimate goal is to find other alternatives and solutions. In addition, when gathering intelligence and data, employees need to know how to transform data into numerical, measurable and readable information.

Even though Sundell has taught Lean Start-up, he argues that teaching Lean Start-up is possible but it is still missing elements in order to master the method in practice. Meaning that it is easy to go into details and get stuck but hard to picture the vision

about what to achieve. Moreover it is also easy to be visionary and picture all kinds of things but that vision is hard to put into action and focus on small steps.

All interviewees agree that the most helpful principles from Lean Start-up are the cost efficiency, reduction of waste (wasteful activities), experimentation and testing. Vakkila says that in the big corporation, the cost efficiency allows teams to start projects easily and lightly without making any budgets. Therefore the Lean Start-up functions because there are no assumptions or guesses. Furthermore it improves skills, knowledge and learning because one must to be honest to him-/herself about the work in progress. In addition, it forces to focus on one task at a time. According to Tikka, Lean Start-up naturally requires a lot of motivation to learn. But when internalised, it will increase motivation. Moreover it increases communication and the implementation of experiments and tests. Lastly, innovation would make a leap because people would have a good methodology in their fresh memory on how to bring something new to the world and take the ideas forward to implementation stage. Sundell emphasises that the Lean Start-up is "a method of concrete doing and learning". Meaning that learning how to improve to learn better next time is crucial. Not only learn things about entrepreneurship or Lean Start-up.

During the interview, it appeared that all the principles and methodologies of the Lean Start-up are familiar to lecturers in a basic level. The most common method of teaching the Lean Start-up is the customer contact, because today people are more realistic as Nyberg puts it. Therefore the approach on doing things is testing and iterating, in order to move things forward. In addition to customer contact, the benefits are also agility and emphasis of the teamwork in the Creative Academic Entrepreneur -course said Örnberg. The starting point is the Business Model Canvas, which can be customised and developed and therefore it is becoming clear and easy tool to be perceived. At Laurea UAS, the Customer Dominant Logic is a theory part whereas the Lean Start-up is a concrete tool that pushes to identify customer pains before building random solutions. Furthermore there are elements of fast commercialising and marketing. And when the thinking changes to customer centric thinking, it will affect on business positively, concluded Ojasalo.

The students are familiar with the Lean Start-up and know the basics of the main principles and methods. Buyle and Selvarajan have used the methods and principles of the Lean Start-up in their studies to some extent. According to Buyle, the most helpful prin-

ciples and methods have been testing solutions to solve a problem with the aim to learn about the product development as quickly as possible. Shortly said, it is better to fail as soon as possible during the product development in order to save time and resources. Furthermore the process of the Lean Start-up encourages to make face-it or break-it decisions. Helpful principles for Selvarajan have been the emphasis on communication with customers in order to receive feedback. Then the development happens according to the feedback of the customers. In Koskivuo's opinion, the Lean Start-up gives readiness for a person itself, for a company and for a product. When the product hits the market, it sells better because it already have the features valued by the market. Therefore it is all about testing what is crucially important and what is waste in terms of a product development.

4.5   Gaps in the Lean Start-up

Tikka, Vakkila and Sundell agree that there are gaps in the Lean Start-up. In Vakkila's opinion the largest gap is the lack of ambition and vision. The purpose is to grow after all, but instead it might make companies and people cautious. Therefore operations can continue as small as possible. Furthermore it is a buzzword. Other gaps are the lack of cases that can be compared with each other. In addition, most examples are from Internet businesses. Meaning that there are no success stories from other businesses and industries. Thus it is easy to forget where Lean Start-up can be applied. As Vakkila says: "There are need for ordinary cases." Lastly, it is very easy to use Lean Start-up when starting from a scratch. But applying the method is another issue, when a company has existing business and customers. Another gap is the growth of the business in existing company.

The gap, according to Tikka, is the initial preparation of Lean Start-up; that is, there are a lot more things happening before the activities described in Lean Start-up by Ries. For instance, the book does not give insights into approaching a start-up with a wild vision and idea or finding a problem. Moreover, Ries also fails to provide information on quantifying and measuring data and activities, which is critical for a startup since this data needs to be analysed continuously.

Sundell argues that there might not be gaps but at least weaknesses. First, the Lean Start-up has been made "too cool" meaning that people do it in order to promote certain profile. As an example, today software and Internet companies are emphasised the

most in the scene of the Lean Start-up. Secondly, the Lean Start-up is trying to be made easy by canvases e.g. "Business Model Canvas". Problem lies in a canvas that is being used blindly without considering other tools and testing the feasibility because it is too easy to get in stuck with one tool. Lastly, the Lean Start-up books don't give a comprehensive picture enough about the concept.

The gaps in the Lean Start-up are mostly related on the whole concept. For example Nyberg has never received a holistic presentation about what is the Lean Start-up and what it really consist of. Moreover Ojasalo said that maybe the largest gap is taking the Lean Start-up into practice. "How it has been implemented and what have been the results?" – Ojasalo. However Örnberg has not noticed any gaps so far because students have taken and internalised the Lean Start-up very well.

All the students agree that there are gaps in the Lean Start-up. Buyle reckons that sending a poor product (Minimum Viable Product) to a market is a weakness. Moreover there are limitations when the cost of pivoting is expensive and rushing can slow growth and revenues. There is also a tendency to focus on one variable and feature development instead of a concept. Thus, focusing on features can distort the testing phase. According to Selvarajan, it is easy to implement Lean Start-up methods when it is a mobile or web based service or program. However the bigger the project, the harder it becomes. In addition, receiving funding and resources are missing from the topic. From the perspective of Koskivuo, the most challenging part is to install the Lean Start-up thinking into a company. However when the company is in a crisis, then the Lean Start-up can be very helpful.

4.6   Tips to Improve Entrepreneurship Education Programmes/Courses, Lessons Learned and Good Practices

Tips from Taneli Tikka:
Tips that are emphasised by Tikka are the quick learning and the process of quick learning. One of the examples how to learn fast is continuous deployment of an idea or a prototype that can provide continuous stream of feedback. Furthermore in order to support the process of quick learning, there must be more understanding of fast cycles and the personal interaction e.g. motivation. In addition, bureaucratic activities should be abandoned.

The given concrete examples that resemble the tips are Supercell, Lean LaunchPad and Kaospilot (www.kaospilot.dk).

Tips from Juha Vakkila:

Juha Vakkila gave a vision where students and companies such as Fonecta could form collaborative teams. Thus, the student teams could do real-life cases with companies where both parties would learn from each other. The outcomes would be new ideas, freshness and possibly new businesses.

Tips from Ola Sundell:

Firstly, using the term "entrepreneurship education" should be stopped in the education. An argument for that is the idea of compartmentalisation. Entrepreneurship education does not compartmentalise easily into the small entrepreneurship concept, where the model of thinking starts from the endeavour and then continues through to growth. Sundell's opinion is to start from the growth and then continue to doing, because many think that in order to succeed, one can just endeavour.

Tips from Timo Nyberg:

Focus should be on giving chances and opportunities to everyone to succeed instead of building "Star Leagues" which is happening at Aalto University. Meaning that the best students, who have participated in some specific courses, are taken around the world and therefore regarded better than others. In addition, the courses cannot be burdensome and therefore the workload should be in relation to the amount of credits. For example how much students are expected to orient on study materials.

Tips from Erto Örnberg:

In the University of Helsinki, it has helped a lot that entrepreneurship has been approached more loosely. For example, topics vary from intrapreneurship to innovation and creativity. These types of topics in courses activate people to act and see that there are different possibilities. Furthermore when things are contemplated together, it creates basis for entrepreneurship. And this has been challenging before.

Tips from Katri Ojasalo:

A great way to get students more involved with entrepreneurship is to lower the threshold by bringing company cases that can be both success and failure stories. Moreover another good way to activate students is to give credits when they have taken part in

competitions, jams and networking events. Students also have to write blogs about their experiences from the events.

Christophe Buyle:

Entrepreneurship Education should be compulsory and part of the curriculum of Bachelor degree. Furthermore, each student should take part in entrepreneurship education in the first year. Meaning that every student would have the possibility to have an introduction to entrepreneurship and learn skills that are necessary to become an entrepreneur.

Jason Selvarajan:

There should be more opportunities to get involved in competitions, events and networking sessions organised by school, companies or other organisations. "Also being part of other external programmes e.g. Sci-preneurship: 24-hour student contest in Barcelona Spain has been a great learning experience." – Jason Selvarajan

Juho Koskivuo:

School should offer compulsory courses about entrepreneurship and after completing them; one can choose more elective courses. The first phase would include the mentality and mind-set part and the second phase would be an opportunity to immerse more into entrepreneurship. The features would be commercialisation of products and services with element of mentoring that would grant credit points when completing successfully for example.

5   Conclusion and Discussion

As the aim of the thesis is to present alternatives and the best practices to improve the entrepreneurship education that have been implemented, the results shows that entrepreneurship education is in the process of being updated and modernised to meet the skills and knowhow needed in the current labour market. However there are still traditional approaches and bureaucratic activities that do not create any value an entrepreneur such as business planning and filling various forms or documents. Moreover there is still an element where the only goal is to become an entrepreneur for the sake of being entrepreneur as Sundell commented, but only certain people can become the entrepreneur regardless how they are taught said Vakkila. On the other hand, based on lecturers' and students' voice, there seems to be a mix of both old and new thoughts that are taught at school but the progress is moving towards the practical and hands on learning that aims to encourage individuals and groups to be proactive in terms of self development or testing business ideas.

There are two main themes that are to be highlighted from the results. The first theme that should be covered more often in the entrepreneurship education is the personal interaction and team building according to Tikka. These issues should be addressed in the beginning of the process when the team is built in order to avoid fights and boost motivation. When companies fail, that is due to the lack of interaction and close communication among the people running the business. Furthermore conflicts often arise among team members when there is a lack of systematic methods for example. The key is a combination of methods that helps to validate ideas and visions systematically because then each member will be held accountable and responsible for his/her decisions and activities. Having both accountability and responsibility increases the motivation and will to move out of the comfort zone. This leads to the concept of Lean Start-up, which is the second theme that the entrepreneurship education must cover in order to develop.

The Lean Start-up offers a systematic process to validate hypotheses that are unknown but also increases the rate of implementing experiments and tests, also known as business modelling and customer development. Cost efficiency increases too while reducing wasteful activities. It also brings the elements of fast development cycles and iteration therefore helping to start projects quickly and simply without budgets. As a byproduct, there will be improved skills, knowledge and learning due to the progress of

work. Focus is also one of the qualities of the Lean Startup, which is crucial to complete tasks. As a note, it is important to know that multitasking is not a trait of the Lean Start-up.

In terms of teaching the Lean Start-up, the first drawback is the need to have a presence of a teacher and practical cases ready at hand, Tikka mentions. This is due to a fact that without experience, it is hard to identify and see how to apply the Lean Start-up in different situation, even though "going by the book". Thus, it raises a question whether teachers have enough experience in applying Lean Start-up in education. Arguably, teachers know the theory of the Lean Start-up but how it has been implemented and what have been the results are the major gaps, as Ojasalo commented. One of the solutions is to have mentors in the course with the business background regularly that could help applying the Lean Start-up in different situations, like in the Lean LaunchPad course ran by Blank.

The second drawback of the Lean Start-up is making companies and people cautious. Meaning that the people of the company start to stay in their comfort zone and avoid risk taking. The effects are the lack of high ambition and vision that conflicts with the intention of scaling and growth of the business. Due to the trade-off, the company must be ambitious and dare to take risks in exchange of the growth. One criticism towards the Lean Start-up is the fact that there are still gaps regarding the topics of repeatability, scalability and growth that the business model canvas, customer development or Build - Measure - Learn -loop properly answers.

In conclusion, the Lean Start-up offers the closest scientific method for entrepreneurship education, due to the combination of systematic processes and tools that are available. Furthermore the principles are approachable, practical and therefore applicable in many parts. Thanks to the method, it has inspired people to become entrepreneurs and boosted the willingness to start own companies in hopes of building likely more successful products and services. However, there are three things where the Lean Start-up still needs to be improved. The first is located in the beginning of the Lean Start-up process where it does not give insights on how to approach a start-up with a vague idea, problem or vision. The second is related to measuring and metrics. The Lean Start-up has discussed about it but not yet provided any concrete information and examples. Lastly, the topics of scalability and growth have to be reviewed in more detail in order to prove any applicability on them.

5.1 Recommendations

Based on the results, the recommendations section presents alternatives on how to develop entrepreneurship education and run start-up courses. The recommendations are also targeted for all the school as a whole on how to improve, develop and get progress in other degree programmes in order to foster entrepreneurial courses and activities.

5.1.1 Entrepreneurship Course, Team Building and Ideation

According to the results, one of the reasons behind students' prejudices towards entrepreneurship is due to a lack of exposure. In order to avoid prejudices, the first recommendation is to give an exposure by embedding entrepreneurship into the curriculum in the first year. When there is a compulsory entrepreneurship course, all students will be exposed to basics of the topic such as team building and ideation, therefore giving students a choice to continue with entrepreneurial courses in the future studies. However, the main point is to give an environment for student to test whether entrepreneurship is an interesting and viable option, regardless of the degree programme. Furthermore, when entrepreneurship courses are implemented in the first year, students will get positive signals that the school and teachers are supportive and encouraging about it.

Highlighting the importance of team building and teamwork, the process must start from the basics. For example having open discussions about the amount of work each team member spends to the project is essential. The end results should be evaluated according to the amount of contribution based on participation on events, classes and customer interviews. In addition, team building and teamwork can be supported by organising hackathons where students have one day to form a team, find a problem, hack an idea and finally go out to test it. Thus, both ideation and team building themes are covered at the same time. The emphasis should be also on networking events, organised by school. This would be helpful for students who are in the process of building a team because it would increase their chances of finding members with different expertise and skills across the campuses. In addition to schools, there are many entrepreneurial organisations, institutions and private companies that organise free events

for all. Such organisers are HUB13, NewCo Factory, Helsinki Think Company, Aaltoes, Startup Sauna and Arctic Startup to name a few.

The third recommendation is the focus on ideation that would be covered in the beginning of the course because students have had a lot of difficulties finding a common idea to work on and continue as a team throughout the course. The stronger and tangible the idea is, the more likely the team is going to stick together. Furthermore the backgrounds of the students affect on how teams will find ideas. One of the solutions on how to help students to pool ideas is to listen companies such as Tieto and Fonecta who often present their problems and needs in order to find teams to solve problems they are facing.[16] The aim is to encourage choosing ideas that are showing existing traction in the market instead of brainstorming inside four walls. This approach would then foster the beginning of collaboration between schools and companies as a by-product.

5.1.2 Physical Support and Culture of Experimentation

As the activities of students happening during their spare time are the most essential part of running the start-up courses, the school should consider about how to provide a physical support to its students in a form of a space. In the space, students could recruit team members, network with like-minded people who are into entrepreneurship, or simply work on their project for 24/7. This could be called as an incubator, accelerator or a start-up hub but eventually the main activity remains the same. Furthermore, the students should run the space independently and build its own community and culture. And the role of the school would be only to advise and mentor the students in the community.

Another function of the space is the need to foster the culture of experimentation because the problem is the lack of an environment where students can experiment their ideas, run tests and build them. Furthermore giving chances and opportunities to everyone to fail and succeed. Due to the lack of the experimental environment, teachers rarely see any physical and concrete results even though it is demanded. Meaning that, students need to test as many times as needed their own relationships within a team and change teams if it is necessary for example. Therefore, taking the experimentation culture to be part of the approach would be the last recommendation.

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Appendix 1: Interview Questions for Lean Start-up Practitioners

A. Background Information

1. What is your name, title and company you work for?
2. Have you been aware of any entrepreneurship education course during your studies?

Jump to the C. part of the interview questions if you have not been aware of entrepreneurial course/s.

3. Have you attended an entrepreneurship course or programmes?
4. Has it been compulsory or elective?
5. What was the purpose of the course?

B. Entrepreneurship Education in more detail

6. What were the traits of the entrepreneurship course?
7. How many credits students received and how heavy the course was?
8. What were the role models in the entrepreneurship course?
9. Who or what were the role models?
10. What type of methods did you use in your entrepreneurship education course? E.g. theories, practices and tools?
11. Did it improve the quality of the education?

C. Gaps in Entrepreneurship Education

12. Can entrepreneurship be taught?
13. Are there gaps in entrepreneurship education?
14. If yes, what are the gaps?

D. The Lean Start-up

15. Are the Lean Start-up principles and methodologies familiar?
16. Is your knowledge about the Lean Start-up in a basic, good or great level?

Jump to the F. part of the interview questions if you are not familiar with the principles and methodologies of Lean Start-up.

17. Have you taught Lean Start-up?

18. Can Lean Start-up be taught?

19. What principles and methods are helpful in the Lean Start-up?

20. What is your view on the functionality of the Lean Start-up?

21. Does it improve the skills, knowledge and learning?

E. Gaps in Lean Start-up

22. Based on your knowledge, are there gaps in the Lean Start-up?

23. If yes, what are the gaps?

F. Tips to improve Entrepreneurship Education programmes/courses, Lessons Learned and Good Practices

Appendix 2: Interview Questions for Educators

A. Background Information

1. What is your name, title and a school you work for?
2. Do you teach / have you taught an entrepreneurship education course at your school?

Jump to the C. part of the interview if you do not teach or have not taught entrepreneurial courses.

3. How many courses do you teach in a year?
4. Is the course compulsory or elective?
5. How many students participate and how many complete the course?
6. What was the purpose of the course?

B. Entrepreneurship Education in more detail

7. What are / were the traits of the entrepreneurship course?
8. How many credits students received and how heavy the course was?
9. Were there role models in the entrepreneurship course?
10. Who or what were the role models?
11. What type of methods did you use in your entrepreneurship education course? E.g. theories, practices and tools?
12. Were the methods useful?
13. Did it improve the quality of the education?

C. Gaps in Entrepreneurship Education

14. Can entrepreneurship be taught?
15. Are there gaps in entrepreneurship education?
16. If yes, what are the gaps?

D. The Lean Start-up

17. Are the Lean Start-up principles and methodologies familiar?
18. Is your knowledge about the Lean Start-up in a basic, good or great level?

Jump to the F. part of the interview questions if you are not familiar with the principles and methodologies of Lean Start-up.

19. Have you taught Lean Start-up?
20. What principles of the Lean Start-up have helped in education compared to the traditional entrepreneurship education?

E. Gaps in Lean Start-up

21. Based on your knowledge, are there gaps in the Lean Start-up?
22. If yes, what are the gaps?

F. Tips to improve Entrepreneurship Education programmes/courses, Lessons Learned and Good Practices

Appendix 3: Interview Questions for Students

A. Background Information

1. What is your name, study programme and school you study at?
2. Have you been to an entrepreneurship education course at your school?
3. Is / was the course compulsory or elective?

Jump to the C. part of the interview questions if you have not been to entrepreneurial course.

4. How many entrepreneurial courses have you completed in a year?
5. How many students participated and how many completed the course?
6. What was the purpose of the course?

B. Entrepreneurship Education in more detail

7. Could you explain the traits of the entrepreneurship course/s?
8. How many credits did you receive and how heavy the course was?
9. Were there role models in the entrepreneurship course?
10. Who or what were the role models?
11. What type of methods have you used in your entrepreneurship education course? E.g. theories, practices and tools?

C. Gaps in Entrepreneurship Education

12. What is your view on the functionality of the entrepreneurship education?
13. Does it improve the quality of education?
14. Are there gaps in the entrepreneurship education?
15. If yes, what are the gaps?

D. The Lean Start-up

16. Are the Lean Start-up principles and methodologies familiar?
17. Is your knowledge about the Lean Start-up basic, good or great level?

Jump to the F. part of the interview if you are not familiar with the principles and methodologies of the Lean Start-up.

Helsinki
Metropolia
University of Applied Sciences

18. Have you used the Lean Start-up methods and principles in your studies?

19. What principles and methods of the Lean Start-up have been helpful?

E. Gaps in Lean Start-up

20. Based on your knowledge, are gaps in the Lean Start-up?

21. If yes, what are the gaps?

F. Tips to improve Entrepreneurship Education programmes/courses, Lessons Learned and Good Practices

Appendix 4: Definitions

1. A pivot = A structured course correction designed to test a new fundamental hypothesis about the product, strategy, and engine of growth.

2. Validated learning = A rigorous method for demonstrating progress when one is embedded in the soil of extreme uncertainty.