

Master Thesis in fulfillment of the requirements for the degree of M.Sc. in Innovation Knowledge and Entrepreneurial Dynamics

# DIVERSITY AND IMPACT OF ENTREPRENEURSHIP EDUCATION. A QUALITATIVE STUDY ON AALBORG UNIVERSITY.

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## ABSTRACT

While the number of entrepreneurships courses and programmes provided by Aalborg University is growing, the specificities, the diversity in terms of approaches to entrepreneurship as well as their impact are not clearly defined yet. This study therefore aims to contribute to the understanding of the particularities of entrepreneurship education at Aalborg University.

Data used in this study is qualitative. Interviews with both students and professors from Aalborg University are analyzed using Glasser and Strauss's (1967) grounded theory. Two other theories are utilized to structure the findings. The first, employed to discover how diverse entrepreneurship education is at Aalborg University, is Neck and Greene's (2011) theory regarding the different approaches to entrepreneurship within entrepreneurship education. The second theory, used to outline the specificities of entrepreneurship education and its impact, is Fayolle and Gailly's (2008) teaching model for entrepreneurship education.

As the results show, placing a great emphasis on planning and prediction, 52% of the programmes providing entrepreneurship courses at Aalborg University are framed within Neck and Greene's (2011) process world. Focusing on entrepreneurial mental models and on planning as well, the second most utilized approach to entrepreneurship at Aalborg University is a mix between the cognition and the process world. More specifically, 33% of the programmes teach by the above mentioned combination of approaches. To a lesser extent, other approaches are utilized as well, either in a mix, either separately.

When confronted with Fayolle and Gailly's (2008) teaching model, AAU entrepreneurship education proved to have a very broad definition. First of all, it is designed for students coming from all kinds of backgrounds, experiences and cultures. Second, it is meant to teach them especially about business planning tools and entrepreneurial thinking theories. Third, it employs Aalborg University's problem-based learning complemented by several other teaching methods. Fourth, and last of all, it has as purpose the training of an elite capable of generating value both for individual and common purposes.

From a theoretical perspective this study contributes to the further development and application of Neck and Greene's (2011) and Fayolle and Gailly's (2008) theories in relation to entrepreneurship education. From a practical point of view, it provides recommendations on how entrepreneurship education programmes at Aalborg University can be improved.

## **1. INTRODUCTION**

Viewed as an important driver of economic growth and as a primary source of innovation, entrepreneurship has been and still is a widely discussed topic among academia, the political as well as the business sphere (Kuratko, 2005).

It started with Schumpeter (1934) and his definition of entrepreneurship as "the creation of something new". Having his definition as a point of departure numerous other scholars have studied the topic and so nowadays entrepreneurship has different meanings to different people. Since there is no mutually accepted definition, a veil of uncertainty lies upon the concept of entrepreneurship but, regardless of that, contemporary scholars always tend to associate it with the terms "creation" and "opportunity" (Kuratko, 2005).

Even though defining entrepreneurship has been in the focus of many researchers, this has not been the only concern in relation to the concept. Many others concentrated their efforts on determining whether entrepreneurship is an innate talent or it can be taught. From this debate of whether becoming an entrepreneur is subject to the genetic inheritance or to an external factor like entrepreneurship education, a slightly different but yet related topic came forth: the relationship between formal education and entrepreneurship. Out of the researchers interested in this topic, van der Sluis et al. (2008) studied the relationship between one's schooling level and the probability of selection into entrepreneurship by looking not specifically at entrepreneurship education but at education in general.

The "born or made" issue in regards to entrepreneurs and entrepreneurship is still a subject of debate with supporters of each side but also with scholars like Kuratko (2005, p. 580) who claims: "*the question of whether entrepreneurship can be taught is obsolete.*" To argue his claim, Kuratko (2005) brings forth the widely accepted function of entrepreneurial ventures as key to innovation, productivity and effective competition. In his view there are other, more important, questions to be asked, like: "*What should be taught, and how should it be taught?*" (Kuratko, 2005, p. 580).

Considered to be one of the fastest growing academic trends in the higher education (ASHE, 2009), entrepreneurship education has attracted in the recent years the attention of researchers, academicians and policy makers.

This impressive growth has been triggered and maintained by both *push* and *pull* factors. On one side it has been pushed by the policy makers through different initiatives and on the other side it has been pulled by the numerous students requesting this kind of study programmes (Fiet, 2000, p.102).

One of the very first initiatives from the *push* side would be the one started by the USA government in the 1970's with the purpose of training and educating people to be more entrepreneurial (Fiet, 2001). In the more recent times, a good representation of the push side would be the European Commission (2012) which encourages this type of education by introducing entrepreneurship programmes at all levels, from primary school and all the way through university.

Representing the *pull* side, students who are more and more interested in gaining entrepreneurship knowledge and skills request entrepreneurship courses and programmes from their universities as they consider becoming entrepreneurs a promising career alternative (Azim & Al-Kahtani, 2014).

#### **1.1. Problem formulation**

There are a few key aspects related to entrepreneurship education which led to the choice of this study's objective. The first aspect, into which I came across while I was conducting a literature review on entrepreneurship education, is the question emphasized by Kuratko (2005): "What should be taught [when teaching entrepreneurship], and how should it be taught?". The second aspect, which is very much related to the first one, is the great diversity of scholars studying entrepreneurship education and coming with different propositions for how it should be done. Moving from theory to practice, the third aspect is represented by the different educational institutions providing different entrepreneurship education study programmes. Added to those aspects, is the one of the different policy makers encouraging entrepreneurship education through different measures and regulations. Last but not least is the aspect of different students with different interests requesting entrepreneurship programmes from universities.

Looking at all these aspects, one single concept seems to stand out: diversity. The scholars interested in the topic are diverse and so are their approaches to entrepreneurship education as well as their propositions; the institutions and the study programmes providing

entrepreneurship education are diverse; the policy makers use diverse measures to influence entrepreneurship education so that it has diverse goals; and finally the ones who benefit of this education are also diverse people with diverse interests and objectives.

With all these considerations in mind and with the experience of being a student within an entrepreneurship programme at Aalborg University, the idea of studying how diversified is entrepreneurship education at Aalborg University came to life. These being said, the questions this study revolves around are the following:

How diverse are the approaches to entrepreneurship education within Aalborg University? What are the specificities and what impact does AAU entrepreneurship education have on its students?

# 2. THEORETICAL FRAMEWORK

## 2.1. Entrepreneurship education - An overview

Since I have recently approached the theme of entrepreneurship education within a semester project, this section will often make reference to my previous work. In order to discover what entrepreneurship education is, concepts like *entrepreneur, intrapreneur* and *entrepreneurship* have to be understood first.

The concept of the "entrepreneur" has been and still is a challenge today when it comes to defining it as there are definitions almost as many as researchers who have studied it. This was concisely explained by Aouni and Sourlemont (2007) who argue:

"In searching for a definition of the concept of "entrepreneur", Gartner (1990) listed 90 different attributes associated with this concept. More recently, Morris (1998) (...) listed 77 different definitions of the concept of entrepreneurship. This leads to a great ambiguity and confusion." (Aouni and Surlemont, 2007, p.3)

Indeed a one-fits-all definition of the entrepreneur is lacking but the importance this entity has for society is widely acknowledged. The entrepreneur is usually associated with the terms "creation" and "opportunity" and is also seen as someone who does not only create job opportunities, but also as someone who introduces new ideas to the market and creates solutions for the day-to-day issues (Nacuta, 2014, p. 12).

The "intrapreneur" is by most scholars defined as an entrepreneur undertaking his entrepreneurial activity within an existing organization. Intrapreneurship on the other hand, as it is defined by Antoncic and Hisrich (2001), is *"the process of uncovering and developing an opportunity to create value through innovation and seizing that opportunity without regards to either resources or the location of the entrepreneur."* 

Similar to the "entrepreneur", the "intrapreneur" does not have a clear-cut-profile that makes it easy to identify one when seen. There are though a series of characteristics that the intrapreneurs share. They bring forth new ideas and take advantage of the opportunities they spot; they foster change and creativity inside the organization where they work and they don't need to be designated by someone to act the way they do (Menzel et al., 2007).

Compared to the "entrepreneur" and "intrapreneur", "entrepreneurship" as a concept, is not at all less difficult to define. Similar to the other two related concepts, "entrepreneurship" is surrounded by a veil of uncertainty which comes from the various meanings it has to different people (Nacuta, 2014, p. 12).

Entrepreneurship is most commonly viewed as the creation of organizations. It is associated most of the times with the activities that entrepreneurs perform in order to create a new business. A more complex vision over entrepreneurship also includes opportunity recognition, resource harnessing, risk taking and change. Another, even more elaborate view over entrepreneurship takes into consideration the way individuals and organizations innovate, create and implement new ideas. It also covers the way change occurs involving uncertainty and complexity (Nacuta, 2014, p. 12).

Studies have been made in order to observe whether education in general has any influence over individuals' selection into entrepreneurship. Out of these studies, the one cumulating key empirical literature on the subject was conducted by van der Sluis et al. (2008) who arrive to five different conclusions of which only two are interesting here. One of them refers strictly to individuals' selection into entrepreneurship and the other is concerned with the relationship between the years of schooling and business performance.

According to van der Sluis et al. (2008), there is no evidence of a relationship between the number of years individuals spend receiving an education and the probability of selection into entrepreneurship but there is though a relationship between the number of schooling years and business performance. The reason why selection into entrepreneurship cannot be correlated

with the number of years spent in school is the fact that the two channels which influence selection into entrepreneurship are influenced by the years of schooling in two opposite ways. Explicitly, the two channels mentioned before are the *managerial ability* and *outside options* of individuals who could be selected into entrepreneurship. Together with the years of schooling the managerial ability of individuals rises so the possibility of them becoming entrepreneurs rises as well. On the opposite side though, the outside options also rise but together with them the possibility of selection into entrepreneurship decreases (Nacuta, 2014, p. 13-14).

Moving from education in general towards entrepreneurship education in particular, the first thing to mention is that it is seen by the European Commission (2012) as one of the key competencies of lifelong learning. With the long-term goal of increasing the rates of self-employment and business ownership, the European Commission introduced entrepreneurship education programmes to all levels from primary school and all the way through university (Nacuta, 2014, p. 14-15). A bit different from the long-term goal, the short-term goal of entrepreneurship education as it has been pointed out by Gibb (2005) is developing of a wide understanding of entrepreneurship and acquiring an entrepreneurial mind-set.

Definitions of entrepreneurship education are various but yet similar. According to the Danish Foundation for Entrepreneurship – Young Enterprise (2013, p. 14), who broadly defines the concept, entrepreneurship education can be described as "content, methods and activities supporting the creation of knowledge, competencies and experiences that make it possible for students to initiate and participate in entrepreneurial value creating processes."

There are plenty other definitions in the literature which revolve around the same idea pointed out by Hynes and Richardson (2007) who claim that entrepreneurship education is more than teaching people how to start-up a business. It is in fact about providing students with the knowledge, skills and competencies to act in a more enterprising, innovative and flexible manner (Nacuta, 2014, p. 15-16).

There are three perspectives from which entrepreneurship education approaches entrepreneurship: *as a matter of culture or state of mind, as a matter of behavior* or *as a matter of creating certain situations* (Fayolle and Klandt, 2006). When entrepreneurship is regarded as a matter of culture or state of mind it is in fact making reference to the specific values, beliefs and attitudes. It is about creating the entrepreneurial mind-set, spirit and identity. When it is viewed as a matter of behavior the focus goes on the specific skills

characteristic to entrepreneurial behavior, like opportunity recognition, decision making and other social skills. Finally when considered as a matter of creating certain situations, entrepreneurship covers only the creation of new businesses and entrepreneurial situations (Nacuta, 2014, p. 15).

The importance of entrepreneurship education has become with yeas a subject of debate between the different stakeholders involved. Taking the side of entrepreneurship education, the number of study programmes having entrepreneurship in focus has increased in the recent years showing there is a demand for this type of education. On the other side the studies trying to prove this education's inefficiency and lack of value has increased as well. Also different actors within the education system which are skeptical about this type of education try to make a statement by arguing that entrepreneurship education is the private sector's way of invading an corrupting the class room (Surlemont, 2009). They see it this way because the promotion of entrepreneurship in schools is a lot of times driven by authorities outside the educational system, like the business community or the ministry of economic affairs. Because it comes from these outside entities, educational institutions often see promotion of entrepreneurship as external pressure which makes the professors susceptible about their academic independence. This skepticism is probably determined by the fact that most of professors have little business experience and the educational system is in most of the cases their sole frame of reference (Sourlemont, 2009).

Out of the ones trying to argue that entrepreneurship education is important, Henry et al. (2005) have an extensive approach to the issue by providing a series of reasons not at one but at five different levels. Henry et al. (2005) took further the ideas of Gibb and Cotton (1998) by using a figure (Fig. 1) initially meant to explain the importance of entrepreneurship only.





<sup>(</sup>Source: Gibb and Cotton, 1998, p.8)

The first level taken into account by Henry et al. (2005) is *the global level* where they argue that the reduction of trade barriers and the introduction of the Euro currency combined with the new discoveries in terms of telecommunications, technology and transportation have a great influence by providing more opportunities but also more uncertainty in the world. Moving to *the societal level*, complexity and uncertainty are enhanced by the privatization, the deregulation and the new forms of governance which add to the constant increases of environmental concerns and the growing acknowledgement of the rights of minority groups. The next level taken into consideration by Henry et al. (2005) is *the organizational level* where the uncertain climate is created by the decentralization, downsizing, re-engineering, strategic alliances, mergers but also by the growing demands for flexibility and adaptability within the labor force. At *the individual level*, uncertainty comes from the variety of employment options, the necessity of having a portfolio of jobs and the higher degree of responsibility required by each job. Finally, on *the personal level*, individuals face uncertainty when it comes to managing credit and secure financing for their future (Henry et al., 2005, p. 100).

All the above mentioned changes, called by Gibb and Cotton (1998) *repositioning*, which take place at all levels, create a high degree of complexity and uncertainty of the reality we live in, as Henry et al (2005) argue. In order to face all these changes and reduce the complexity and uncertainty, individuals need to acquire new skills and competences which entrepreneurship education provides.

As the literature shows, Gibb and Cotton's (1998) repositioning was also observed by other authors as the reason behind the importance of entrepreneurship education; the difference though stands in the terminology they used and on the fact that not all of them have in focus all the five levels (Nacuta, 2014, p. 17).

Authors like Kuratko (2005), Matlay (2005) or Naby and Holden (2008), who attack this issue from the global level by linking entrepreneurship education with economic prosperity, bring forward as arguments for the importance of this kind of education, the future small business growth and the new venture creation. Condensing all their efforts towards the societal level, Fayolle et al. (2006) argue that the importance of entrepreneurship education stands in its direct and indirect impact over society. They mention as direct impact the new venture and job creation and as indirect impact, on which the emphasis is laid upon, the increasing entrepreneurial spirit amongst individuals. Having in focus the individual and personal level,

a great deal of authors (like: Krueger et al., 2000, Zhao et al., 2005; Fayolle et al., 2006; Wilson et al, 2007) evaluate the importance of entrepreneurship education by the effects it has on individuals' behavior. They started by using psychological concepts like the need for achievement and locus of control but more recently they adopted other concepts like self-efficacy, intention and theory of planned behavior (Nacuta, 2014, p. 17-18).

To start with the students' self-efficacy, studies show that it increases once they start taking entrepreneurship courses and together with that their career plans and intentions of becoming entrepreneurs are rising as well. Intention, the best predictor of planned behavior and the source of intention-based theories, is used to observe how individuals take action towards becoming entrepreneurs. Another dimension taken into account is attitudes, which between other can be influenced by environmental factors, such as educators for instance. Building up on these ideas researchers tried to prove that attitudes are important for individuals' entrepreneurial actions and with educators being able to influence attitudes, entrepreneurship education also influences the entrepreneurial behavior. However, the empirical findings are partly inconsistent (Nacuta, 2014, p. 18).

## 2.2. Different ways of teaching entrepreneurship

It is widely agreed among theoreticians that entrepreneurship courses should be taught in a different way than the traditional courses. Kent (1990) expresses this idea in a brief but meaningful way, saying that "entrepreneurship education must be entrepreneurial" (Kent, 1990, p. 284). Another one of the early writings on the subject emphasizes that traditional approaches which are tools-oriented, overspecialized and compartmentalized don't have any utility in solving the unstructured, ambiguous, complex and multidisciplinary real world problems (Plaschka and Welsch, 1990, p. 61).

Another issue on which the majority of scholars agree upon is the fact that there are three approaches used to teach entrepreneurship. For example Fayolle and Klandt (2006), who have been mentioned before, have classified these three approaches as follows: *as a matter of culture or state of mind, as a matter of behavior* or *as a matter of creating certain situations*. Making reference to the specific values, beliefs and attitudes is the approach where entrepreneurship is seen as a culture or state of mind. The one where it is regarded as a matter of behavior has in focus specific skills like opportunity recognition and decision making. The

third approach regarding the creation of certain situations covers the creation of new businesses and other entrepreneurial situations (Nacuta, 2014, p. 15).

#### 2.2.1. Neck and Greene's theory

Neck and Greene (2011) have named the three approaches to entrepreneurship "worlds" and according to them they are the following: *the entrepreneur world, the process world* and *the cognition world*. They also say that each entrepreneurship professor either chooses a single world when teaching entrepreneurship, either a combination of two or even all three of them.

In the first world, as it can be easily observed from its name, the entrepreneur is the central element. The focus goes mainly on the entrepreneur's traits which are very close to those of a superhero (Neck and Greene, 2011, p. 57). The definition of entrepreneurship used in this world is very narrow and only includes the creation of businesses. Also due to the high emphasis placed on the characteristics of the entrepreneur, students taught in this world usually see "entrepreneurship as a box in which they either fit or do not" (Neck and Greene, 2011, p. 58). Their concern is that they do not have the right characteristics to be entrepreneurs, so instead of promoting entrepreneurship, courses taught in accordance with this world actually hinder it. Such courses do not provide knowledge on how students can become entrepreneurs; they only provide knowledge about entrepreneurs.

The process world regards entrepreneurship as a process where the emphasis goes on the organizational level (Neck and Greene, 2011, p. 59). Entrepreneurship is not seen in this world only as the creation of businesses but as a journey from business creation and up to business exit. A very important place is occupied by the capital markets, resource allocation, performance, and growth. The process world is also referred to as a world of planning and prediction where the business plan is the champion. The problem with this world though, as it is pointed out by Neck and Greene (2011, p. 60), is that entrepreneurship is neither linear nor predictable, but it is easy to teach as if it were.

Another theory worth mentioning here, which is in line with Neck and Greene's (2011) argument, is Sarasvathy's (2001) causation and effectuation theory. The process world from Neck and Greene's (2011) framework fits perfectly with Sarasvathy's (2001) causal reasoning which is based on the logic: *"To the extent that we can predict the future, we can control it"* (Sarasvathy, 2001, p. 251-252). Sarasvathy (2001) explains causal reasoning by using the example of the corporate business world's way of thinking. With a pre-established goal to be

achieved and a specific set of tools to be used, the entrepreneur has to determine the optimal – fastest, cheapest, most efficient – way of reaching the given goal. Causal thinking as it is taught in the majority of business schools teaches the students how to reach an already established destination. The standard steps which have to be followed when applying causal reasoning in a business context are: (1) business plan development based on (2) market research and (3) competitive analysis, followed by (4) resources and stakeholders' acquisition for implementing the plan and then (5) environment adaptation with the purpose of (6) creating and sustaining a competitive advantage (Sarasvathy and Dew, 2005). Similar to Neck and Greene's (2011) process world, opportunity recognition and business plan development are the key components of the causation approach. Causal entrepreneurs take and already existing market opportunity and turn it into a sustainable competitive advantage by using the available resources. They act by the causal standard which says: all the pieces are there, they must only be assembled (Sarasvathy, 2008).

Different from the causal reasoning, there is the effectual reasoning which is based on the logic: "To the extent that we can control the future, we do not need to predict it" (Sarasvathy, 2001, p. 251-252). If causal reasoning means taking a pre-established goal and concentrating on choosing the fastest, cheapest and most effective way to achieve it, effectual reasoning implies having a set of means and focusing on selecting the potential goals to be reached by using those means (Sarasvathy, 2001). The entrepreneur who acts according to the effectuation approach will start the new business with some expectations in mind but these will change together with each decision he makes and with every new opportunity that arises. He is capable of acknowledging the unpredictability of the future so before adopting a specific business model he tests several approaches in the marketplace. Sarasvathy (2001) also argues that even though most business schools teach causal reasoning, successful entrepreneurs have a preference towards effectual reasoning in their decision-making processes. They are, of course, capable of using both causal and effectual reasoning according to the circumstances, but successful entrepreneurs have a natural tendency towards using effectual logic instead of causal logic. This is happens especially in the early stages of their business, when risk and uncertainty are on high levels.

Returning to Neck and Greene's (2011) framework, the last approach to entrepreneurship, namely the cognition world, is the most recent approach, having only 15 years since it had been noted the first time and about 5 since it has been introduced into the classroom (Neck and Greene, 2011, p. 60). The most important role in this world is played again by the

entrepreneur or the entrepreneurial team but in a different way than it is in the entrepreneur world. The focus goes on individuals' potential for learning how to think entrepreneurially and the question governing this approach is "how do people think entrepreneurially?" This world recognizes the great diversity in the ways people can be entrepreneurs (Neck and Greene, 2011, p. 60). By emphasizing the entrepreneurial decision, professors teaching by this approach often bring the students into discussions about the role of expert scripts, heuristics and schema which lead to the creation of entrepreneurial mental models (Neck and Greene, 2011, p. 61).

After classifying the three approaches to teaching entrepreneurship, Neck and Greene (2011), proposed another approach themselves; they suggest using entrepreneurship as a method. They say this method teaches students how to think and act based on a set of assumptions and techniques that encourage creativity. As they argue, this method "forces students to go beyond understanding, knowing, and talking. It requires using, applying, and acting. The method requires practice" (Neck and Greene, 2011, p. 62). In order to teach by this method, Neck and Greene (2011) suggest a portfolio of activities including: starting businesses as part of coursework, serious games and simulations, design-based learning and reflective practice.

The purpose of the activity which includes *starting a business* is to allow students to practice business and entrepreneurship so the theoretical content of the course comes alive. Neck and Greene (2011) suggest that this activity should take place at the beginning and not at the end of entrepreneurship programmes because with so little business experience, practice is the only way for students to develop empathy for the entrepreneur. Another reason would be the increased level of confidence that students gain from the "doing" experience (Neck and Greene, 2011, p. 63).

*Serious games and simulations* as a method stands on a foundation made of two elements: the element of "game" which implies a set of rules and the element of "game play" which is associated with a fun activity. Having these two as a basis, gaming becomes an activity incorporating learning, play and participation which exposes students to real-life challenges transposed in a virtual world (Neck and Greene, 2011, p. 64). This method, as Neck and Greene (2011) argue, provides students with a different environment to practice entrepreneurship. They see it as a playful approach with serious results.

The *designed-based learning* has as a take-away point the assumption that entrepreneurs act very similar to designers. By using this method to teach entrepreneurship, students are

provided with a certain set of skills that allows them to identify and act on unique venture opportunities. In Neck and Greene's (2011) view, this set of skills includes observation, fieldwork and understanding value creation across multiple stakeholder groups. This method, different from many others, concentrates on the identification and exploitation of opportunities; it does not take opportunity as something which has already been identified and only needs to be worked on. This method implies that the discovery process has its roots in the most fundamental design principles so students taught within this methods should be capable not only of spotting opportunities but also of creating them (Neck and Greene, 2011, p. 65).

The *reflective practice* is meant to teach the students how to create knowledge from experience by reflecting on it and trying to understand and explain it. Reflection is a very important process which is of great use in the case of perplexing experiences, high-uncertainty situations and problem-solving; situations which are often experienced by entrepreneurs. The purpose of the reflective practice is to create reflective entrepreneurs which are able to deal with the continuous cycle of action, learning, testing and experimenting characteristic to entrepreneurship (Neck and Greene, 2011, p. 65-66).

#### 2.2.2. Fayolle and Gailly's teaching model

Fayolle and Gailly (2008) propose a "teaching model" (Fig. 2) for entrepreneurship education which integrates two levels: the ontological level and the educational level.

*The ontological level* of the model includes two dimensions itself: one of them focuses on defining what entrepreneurship is and what it is not as a teaching field; the other one defines the implications "education" has for professors and students within an entrepreneurship context (Fayolle and Gailly, 2008, p. 571).

For the first dimension which concentrates upon the definition of entrepreneurship, Fayolle and Gailly (2008) argue that the issue does not stand in the fact that there are a variety of definitions dependent on the different contexts and the different actors. According to them the issue stands in the fact that a precise definition of entrepreneurship as a teaching field is lacking. That is why they make the following proposition: "each entrepreneurship education program should be based on a clear conception of entrepreneurship leading to a non ambiguous definition of entrepreneurship education" (Fayolle and Gailly, 2008, p. 573).

The second dimension, defining education within an entrepreneurship context, has as a takeaway point the definitions of "to teach" and "to educate". Arguing that teaching means passivity from the side of the one that is being taught, Fayolle and Gailly (2008) favor the word "educate" as being more appropriate when it comes to entrepreneurship. As they claim the notion of education, opposed to the notion of teaching, is a better match for situations aiming to develop the students' minds, to raise their awareness of the entrepreneurial phenomenon while boosting their personal and professional development and providing incentives for them to act entrepreneurially. They do not overrule the importance of teaching but they associate it only with the transfer of theoretical knowledge about entrepreneurship. That is why they see as key to entrepreneurship programmes a combination of both "teaching" and "educating". Within this dimension Fayolle and Gailly (2008) also put an emphasis on the roles of the teachers and the students and that is why they make another proposition: "the educator or teacher should clarify for each entrepreneurship teaching course he or she is in charge his or her philosophical positions concerning key conceptions about teaching, the role of teacher and the role of students or participants" (Favolle and Gailly, 2008, p. 574-575).



Figure 2 Entrepreneurship education teaching model

(Source: Fayolle and Gailly, 2008, p. 572)

*The educational level* of the teaching method refers to the design and architecture of the entrepreneurship course or programme. It has five dimensions that need to be taken into consideration (Fayolle and Gailly, 2008, p. 575):

- 1. Why (objective, goals)?
- 2. For whom (targets, audiences)?
- 3. For which results (evaluations, assessments)?
- 4. What (contents, theories)?
- 5. How (methods, pedagogies)?

The "why" dimension takes into consideration the objectives and goals of the entrepreneurship course or programme. As there are so many stakeholders involved, like governments, universities, public agencies, firms and individuals, the objectives and goals have to be clearly decided upon. Entrepreneurship education can have a broad range of goals which could be either learning objectives, either socio-economic objectives. Such objectives can be raising awareness of entrepreneurship or helping students develop the attributes of the successful entrepreneur or helping students acquire a certain set of skills, competences and business knowledge through new venture creation. Because there is such a wide variety within the objectives, Fayolle and Gailly (2008) come with another proposition: "entrepreneurship education course should target clear and comprehensive objectives at the micro (individual, participant) level and at the macro (organization, society) level" (Fayolle and Gailly, 2008, p. 576).

The "for whom" dimension covers the audiences of entrepreneurship education. As literature shows students taking entrepreneurship courses have different backgrounds and different motivations for studying entrepreneurship. They have different socio-demographic characteristics, different levels of involvement and aspirations towards the entrepreneurial activity. This great diversity creates difficulties when a certain course or programme is designed. Fayolle and Gailly (2008) have the following proposition: "entrepreneurship education course should be designed through a thorough understanding of the profile and background of the audience, particularly in terms of prior entrepreneurial exposure" (Fayolle and Gailly, 2008, p. 577).

The next dimension, "for which results" deals with the way evaluation is made within entrepreneurship education. As Fayolle and Gailly (2008) claim, the great challenge of

entrepreneurship programmes is related to the selection of evaluation criteria but even more to their effective measurement. The evaluation criteria are related to the objectives of the course or programme so once the objectives are set, the evaluation criteria can be established as well. The difficulty comes when these criteria need to be measured effectively. Block and Stumpf (1992) created a framework for measurement during, shortly after, between 0 and five years after and over five years after students have attended a program. For each case the different criteria which could be used need to be mentioned. But there are also some other variables that might have influence and which need to be taken into account: the social status of entrepreneurial activities and situations, the parental role models, the prior entrepreneurial exposure or experience and finally, the preference for a self-employment career (Fayolle and Gailly, 2008, p. 578). Taking all these into consideration another proposition has been made by Fayolle and Gailly (2008): *"in line with the objectives and the audience characteristics, the identification of the relevant evaluation criteria, and their effective measurement methods should be defined for each entrepreneurship education course"* (Fayolle and Gailly, 2008, p. 578).

The "what" dimension is focused on the content of entrepreneurship education. It has three dimensions itself: the professional dimension, the spiritual dimension and the theoretical dimension (Fayolle and Gailly, 2008, p. 578). The professional dimension is the practical one including three kinds of knowledge: know-what (what to do in order to decide and act in a certain situation), know-how (how to deal with a given situation) and know-who (who are the people that could help in a given situation). The spiritual dimension has two kinds of knowledge: know-why (what determines human behavior and actions, entrepreneurs' attitudes, values and motivation) and know-when (when is the right time to go ahead?). The theoretical dimension refers to the theories one needs to learn and use in order to understand the entrepreneurial phenomenon. Having all the three dimensions in mind, Fayolle and Gailly (2008) introduced another proposition: "depending on the objectives and audience profile, the contents of each entrepreneurship course should be explicitly defined through a combination of three dimensions (professional, spiritual and theoretical)" (Fayolle and Gailly, 2008, p. 579). It can be clearly observed here that Fayolle and Gailly (2008) fit also in the category of scholars who see entrepreneurship as something to be taught from three different perspectives. Even though their perspectives are a quite different from the ones previously discussed, there still are similarities between them.

Finally, the "how" dimension is concerned with the methods of teaching entrepreneurship. There are numerous teaching methods which have been already tested and used in entrepreneurship education. Some of them are: the use of real-life or virtual cases, role-play and problems. Other, more traditional methods would be: interviews with entrepreneurs or guidance and coaching of young entrepreneurs. All these methods can be applied for the elaboration of business plans, the development of new venture creation projects, behavioral exercises and computer simulations (Fayolle and Gailly, 2008, p. 579). Given that there are various teaching methods, the choice of one or another depends on the objectives and contents of each course and programmes. Having all these considerations as a basis one last proposition has been made: "the selection of the pedagogical methods for each entrepreneurship education course should rely upon their adequacy and a priori efficiency regarding the objectives, the audience characteristics, the contents and the constraints due to the institutional context" (Fayolle and Gailly, 2008, p. 580).

#### 2.2.3. Teaching methods

A literature review conducted by a PhD fellow from the VU University of Amsterdam shows there are numerous articles addressing the teaching methods used within entrepreneurship education. Researching the teaching methods was not though the sole purpose of the review. Mwasalwiba (2010) wanted to study the publications devoted to entrepreneurship education and reveal whether there is an alignment between the generic objectives of entrepreneurship education, its target audience, the teaching methods employed and the impact indicators. He reviewed 108 articles and concluded that the majority of scholars in this field converge towards a single framework of entrepreneurship education. They all seem to favor the use of constructs related to intention-based models while placing less and less emphasis on new venture creation and personal qualities, as there was in the 1980s (Mwasalwiba, 2010, p.40). Another conclusion is that because of the diversity among the target groups, there still is a non-alignment between what educators and other stakeholders wish to achieve in educating for entrepreneurship with the applied pedagogical approaches, and success indicators.

The first articles from the 108 Mwasalwiba (2010) reviewed, were included in the review process for the purpose of establishing a definition of entrepreneurship education. Once that was settled, some other articles were added to the first ones as they have been found relevant for the review of the objectives of entrepreneurship education. The next issue Mwasalwiba (2010) took into consideration was the types of programmes and the target groups of

entrepreneurship education. Then he moved to the course content, the teaching methods and community outreach activities so that he could end with evaluation and impact indicators.

Approaching the definition of entrepreneurship education, Mwasalwiba (2010, p. 26-27) reveals that the majority of articles associate it with some kind of educational or training process meant to influence individuals' attitudes, behavior, values or intentions towards entrepreneurship either as a career, either as an activity which deserves to be appreciated because of its role in the community (i.e. creating an entrepreneurial society). The same number of articles relates entrepreneurship education with the acquisition of personal skills in entrepreneurship, whereas others associate it to new business formation, opportunity recognition and managing of existing small firms.

The main objective of entrepreneurship education, found by Mwasalwiba (2010, p. 26) in the majority of articles, is creating or increasing entrepreneurial attitudes, spirit and culture among individuals and in the general community. The next one, by the number of articles mentioning it, is new venture creation and job creation which is followed by the contribution to the community by helping local entrepreneurs to form and grow. The least mentioned objective is the imparting of entrepreneurial skills among individuals. Another way used by scholars to categorize the objectives of entrepreneurship education is what they termed as educating for, about, in or through entrepreneurship (Mwasalwiba, 2010, p. 27). Educating for entrepreneurship means creating an entrepreneur - an individual who is destined to start a new business. The programmes teaching for entrepreneurship take into account both the present and the potential entrepreneurs and provide them with the tools to start a business. Educating about entrepreneurship means providing a general understanding about entrepreneurship as a phenomenon while educating in entrepreneurship aims to make individuals more entrepreneurial and innovative in their existing firms or work place. Finally educating through entrepreneurship is more of a teaching approach in educating for entrepreneurship than an objective in itself (Mwasalwiba, 2010, p. 27).

The types of programmes teaching entrepreneurship, as Mwasalwiba (2010) classified them, are:

1. Programmes that are meant to provide an orientation and awareness about entrepreneurship;

2. Programmes that develop competences for new venture formation, self-employment, or economic self-sufficiency;

3. Programmes that focus on small business survival and growth.

The most common groups which these programmes are targeting, according to Mwasalwiba (2010), are: business students, entrepreneurs/SME owners, managers and employees, minority groups, non-business university students, policy-makers, bankers and unemployed.

When looking for the most common course content among the programmes teaching entrepreneurship education, Mwasalwiba (2010), found it quite difficult to narrow it down to a relatively small number of modules. He started with a total of 18 most popular subjects, which later on have been narrowed down to 9 most popular subjects: resources marshalling and finance, marketing and salesmanship, idea generation and opportunity discovery, business planning, managing growth, organization and team building, new venture creation, SME management and risk and rationality (Mwasalwiba, 2010, p. 30).

Researching for the teaching methods used within entrepreneurship education, Mwasalwiba (2010) determined that the majority of articles are based on experiments on teaching methods. Some come with propositions of what works best while others reflect on the current teaching approaches. With so many scholars interested in this subject and so many different professors with different approaches to teaching, consensus on the best approach hasn't been reached yet. Mwasalwiba's (2010) review identified 26 methods which later on have been condensed to 13 (Fig. 3) considered to be the most important.



Figure 3 Entrepreneurship teaching methods

<sup>(</sup>Source: Mwasalwiba, 2010, p. 31)

Another fact captured by Mwasalwiba (2010) is that the majority of authors tend to categorize the teaching methods into two groups: *traditional or passive methods*, which are the normal lectures and *innovative or active methods*, which are more action based. From the above 13 most important methods, the passive ones would be: lectures, case studies and group discussions while the active ones would be: business or game simulations, video and filming, role models or guest speakers, business plan creation and project works. The interesting fact here is that even all these methods are known, the traditional ones are still championing entrepreneurship education.

The community outreach activities identified by Mwasalwiba (2010) and grouped according to the number of articles mentioning them, are the following:

1. Business centers and entrepreneurship clubs with local entrepreneurs and technical and management assistance to entrepreneurs.

2. Link with local entrepreneurs through internship opportunities for students.

- 3. Public symposia and awareness campaigns.
- 4. Dissemination of research results to the community.
- 5. Students' consulting projects with local entrepreneurs.

Other activities include technology transfer, incubation services, and annual summer schools for potential entrepreneurs in the community.

Finally, the success and impact indicators of entrepreneurship education, as they are described by Mwasalwiba (2010), are the following: graduate start-ups, students' academic standards (i.e. examination scores), psychological constructs (i.e. change in students' attitudes, perceptions, interest, self-efficacy, confidence, abilities and skills towards entrepreneurship), contribution to the community (i.e. technology transfer, new jobs created, or assistance to local entrepreneurs), students' satisfaction with the course, resulting innovations, graduates' business performance, change on students' need of achievement and locus of control.

#### **2.3. Entrepreneurship education at AAU**

As the previous section shows, there seems to be an agreement among researchers when it comes to entrepreneurship education and the different perspectives it has over entrepreneurship. Even though they use a different terminology, they all argue that entrepreneurship education has three different approaches to entrepreneurship.

In order to categorize entrepreneurship education at AAU and identify the different approaches to entrepreneurship, information about each study programme and its content was gathered from the university's homepage. Detailed information of each specific course included in the programme was provided by the curriculum in the following format: objective of the course, knowledge, skills, competencies, type of instruction, exam format and evaluation criteria. All these details helped create the schema below (Fig 4) which shows how many study programmes at AAU provide entrepreneurship courses.

#### Figure 4 Study programmes incorporating entrepreneurship courses



(Source: created based on the information available on <u>www.aau.dk/uddannelser</u>)

Neck and Greene's (2011) classification will be used to categorize entrepreneurship education at AAU. Comprised of *the entrepreneur world, the process world* and *the cognition world,* this framework suits this study's objectives at its best. The reason for choosing Neck and Greene's (2011) approach stands not only in the clear and very concrete classification they made but also in the proposition they came up with to complete the classification. They argue entrepreneurship should be used as a method itself in entrepreneurship education. According to them this would teach students how to think and act based on a set of assumptions and techniques that encourage creativity. This method would require practice, namely a set of activities like: starting businesses as part of coursework, serious games and simulations, design-based learning and reflective practice.

The first world of Neck and Greene's (20110 framework is about the entrepreneur and his traits analyzed from a perspective where entrepreneurship only covers the creation of new ventures. The second world is focused on entrepreneurship as a process. Emphasizing the organizational level, this world follows the journey a business takes from its creation and up to its exit. This world is also referred to as a world of planning and prediction where the business plan occupies a very important place. The third world has again in focus the entrepreneur or the entrepreneurial team but in a different way than in the first world. The central question here is "how do people think entrepreneurially?" The emphasis in this world goes on individuals' potential for learning how to think and act like entrepreneurs. Diversity among the ways people can act as entrepreneurs is also recognized.

Other classifications which could be used are the ones by Fayolle and Klandt (2006) or by Fayolle and Gailly (2008). According to Fayolle and Klandt (2006) the three approaches from which entrepreneurship is studied are the following: *as a matter of culture or state of mind, as a matter of behavior* or *as a matter of creating certain situations*. Slightly different from that, Fayolle and Gailly (2008) classified the dimensions as follows: *the professional dimension, the spiritual dimension and the theoretical dimension*.

As it can be observed in the figure above, at Aalborg University there are 17 bachelor programmes and 16 master programmes that incorporate entrepreneurship courses. A list with all the programmes can be found in Annex 1. Some of these have entrepreneurship as main focus while others have only one or two courses related to it. For the majority of them, the entrepreneurship courses are mandatory while for a few, students get to choose between taking an entrepreneurship course or something else. Besides these programmes the university offers one-semester modules from which students can choose, like: Creative Genius or New Venture Creation. These can be taken during the master programme, usually in the 3<sup>rd</sup> semester and they can be an option for the programmes where for one semester students are allowed to either take more courses at the university, either study abroad, either take an internship.

#### 2.3.1. Faculty of Engineering and Science

Getting back to the way entrepreneurship education is structured at AAU, the first and most obvious thing to notice is that the majority of programmes offering entrepreneurship related courses are from the Faculty of Engineering and Science. Indeed, as Annex 1 shows, in most of the bachelor programmes entrepreneurship is taught in the 5<sup>th</sup> or 6<sup>th</sup> semester together with the scientific theory specific to each programme. So besides learning about the engineer's role in society and the scientific approaches specific to engineering, students also learn about how to actively participate in starting up a business, how to produce innovative solutions and how to spot opportunities for them. They don't cover the entrepreneur's traits that much but since they are mostly concerned with the creation of new ventures, these programmes fit into the first world from Neck and Greene's (2011) framework, namely the entrepreneur world.

Different from the bachelor programmes, the master programmes from the Faculty of Engineering and Science offer a more complex view over entrepreneurship. If the bachelor students learn about the basic issues of starting up a business, the master students not only go deeper into the details but also approach entrepreneurship through their own field's perspective. They learn about different theories standing behind entrepreneurship and then relate those to their own field's theories. This allows them to structure knowledge in a way that enables them to apply theories in practice through case studies and other similar exercises. For the majority of programmes the theory of effectuation (Sarasvathy, 2001) and also the business model canvas (Osterwalder and Pigneur, 2010) are mandatory to be taught. These are seen as tools students would need in order to start up a business. In terms of competencies, the curriculum shows that students should be able to formulate, develop and present their own field's related business ideas to a qualified audience.

Given all the above, it is fair to categorize the master programmes within the Faculty of Engineering and Science at the border between the process world and the cognition world from Neck and Greene's (2011) framework. The fact that theories like effectuation are included in the course, classifies these programmes within the cognition world as they provide possible answers to this world's main question: "how do people think entrepreneurially?" At the same time, the business model canvas and all the other tools which students are supposed to use from the course in order to gain the competencies stated in the curriculum, frame these programmes within the process world. By learning how to formulate, develop and present

their business idea to a qualified audience, students actually plan and predict a path for their possible business.

Exception from this classification makes a master programme called Entrepreneurial Engineering. Throughout this programme, as the curriculum shows, students learn about different theories, methods and tools within business development, innovation, entrepreneurship, agile processes, prototyping, design thinking and creativity, based on research at the highest international level. They are taught how to use creativity and lateral thinking for the development of new and innovative solutions and methods which could later on become the foundation of a new venture. They learn how to use these new-gained abilities to either start up their own business, either to strengthen the potential for creativity and innovation in existing organizations. The professional competencies of the students taking this programme should cover new business development but also the transformation of organizational settings with an emphasis upon: commercialization of new knowledge, value creation through innovative solutions as well as development and implementation of processes that enable creative and innovative solutions in organizations. Different from all the other programmes teaching entrepreneurship within the Faculty of Engineering and Science, this master programme not only provides the students with general knowledge about the entrepreneurs and entrepreneurship and does not only go into the details of new venture creation and business planning but equips the students with certain skills which will allow them later on to be very flexible in relation to the entrepreneurial activity. Students here do not focus on a single approach towards entrepreneurship. They start by studying subjects which introduce them to entrepreneurship in general, then they continue with subjects about innovation, business models, market and resources so that towards the end of the programme they are prepared for a module called Entrepreneurial strategy where all the knowledge gathered throughout the programme has to be applied. During this module they either take an internship within an already existing organization, either work for their own start-up which they are encouraged to establish during the programme. Given that there's such a variety within the knowledge, skills and competences these students gain while studying this programme, it is quite obvious that it cannot be classified in a single world from Neck and Greene's (2011) framework. This being settled, it is fair to say that this programme fits well with the new world proposed by the two researchers but it fits even better with a mixture of all the four worlds from the framework.

#### 2.3.2. Faculty of Social Sciences

Another faculty providing entrepreneurship education is the Faculty of Social Sciences. Indeed the number of programmes within this faculty that incorporate entrepreneurship courses is considerably smaller than the ones from the Faculty of Engineering and Science but here entrepreneurship is much more extensively covered, especially in the master programmes. If the majority of programmes from the Faculty of Engineering and Science provide one single entrepreneurship course, the ones from the Faculty of Social Sciences put a lot more emphasis on entrepreneurship and in some cases it's even the main focus of the programme.

The bachelor programmes providing entrepreneurship courses do not focus only on entrepreneurship but also on innovation and creativity. They teach the students the importance of innovation and entrepreneurship for corporate survival. They are framing the entrepreneurial activity within an already existing organization, so they are in fact focusing on intrapreneurship. Within these courses students get to work with case studies brought directly from real organizations. They have to work with them and provide viable solutions for their problems. At least in the case of the programme called Public Innovation and Digitizing, students have to come up with digital solutions for the organization's issues. They have to design new software solutions in order to solve the problems. These activities could be easily associated with the serious games and simulations and the design-based learning from the framework created by Neck and Greene (2011). These methods are specific to the new "world" proposed by Neck and Greene (2011) where entrepreneurship is used as a method itself in entrepreneurship education. Added to the use of these methods is the creativity side of these courses. They do not only focus on entrepreneurship within an organization but they also focus on coming up with new, creative and innovative solutions to the organization's problems. These facts allow the bachelor programmes from the Faculty of Social sciences to be classified as being part of the new world proposed by Neck and Greene (2011). They do not fit in either one of the traditional approaches which have also been studied by other researchers but there seems to be a good fit with the new approach that completes the traditional framework. Of course, not all the aspects of this approach can be found within these programmes but there is always room for improvement.

The master programmes within the Faculty of Social Sciences approach entrepreneurship even in a more complex way. Here entrepreneurship is not a side-course but it is the very focus of the programme. Added to entrepreneurship, other important subjects are innovation and creativity; they all are studied on both micro and macro perspective. Students learn about entrepreneurship and innovation at the organizational level but they also learn about organizations as actors interacting and networking with customers, suppliers, competitors, research institutions and others. They learn about the entrepreneur and his traits, they learn about the steps to be taken when starting up a business, they learn about different theories like causation and effectuation (Sarasvathy, 2001), they learn about business models but they also learn about entrepreneurship inside an already existing organization, about the innovation process and how change should be managed inside of the organization. Throughout the programme students are encouraged to write projects in collaboration with different organizations; they are encouraged to work on solving their problems and apply in practice the theoretical knowledge gathered throughout the programme. They also use computer simulations to test their abilities. At least for one of the programmes the simulation requires the students to take some strategic decisions as owners of a venture in order to increase its value and then sell it at the highest price. Throughout the programme students also have to complete assignments where they need to reflect on different subjects discussed during the courses; most of the times these assignments are not graded but it is mandatory for them to be completed.

As previously mentioned, these programmes have a more complex approach towards entrepreneurship. With all the above taken into consideration, it is fair to say that the master programmes within the Faculty of Social Sciences cannot be classified in one single world from Neck and Greene's (2011) framework. They cover a lot of the aspects of the new world proposed by the two researchers but they could also fit in the cognition world or the process world or the entrepreneur world. These programmes are a mixture of all the worlds and as Neck and Green (2011) argue, this is not a unique case. It is not uncommon for courses or programmes to be structured as a mixture of all the three worlds, but in our case it seems like it is a mixture of all the four worlds.

#### 2.3.3. Faculty of Medicine and Health and Faculty of Architecture, Design and Planning

The other two faculties with only a few programmes teaching entrepreneurship are the Faculty of Medicine and Health, with one bachelor programme and the Faculty of Architecture, Design and Planning, with two master programmes. For the bachelor programme within the Faculty of Medicine and Health the entrepreneurship course is an elective one but it is structured in a way that combines both entrepreneurship knowledge and discipline specific knowledge. It is very similar to the majority of bachelor programmes from the Faculty of Engineering and Science; it emphasizes the business plan and different issues related to IPR, copyright, project management and other organization specific knowledge but it does not go into a lot of details. This makes it quite difficult to classify into one of the worlds from Neck and Greene's (2011) framework. The one to which it might fit is the process world but since this programme only covers some basic knowledge it is not a perfect match.

The master programmes from the Faculty of Architecture, Design and Planning teach entrepreneurship more thoroughly even though they provide only one course related to it. The aim of this course is to enable the students to acquire an understanding of how design engineering can be used strategically and as a tool for creating new business concepts. Discipline specific theories are combined with entrepreneurship theories so that design becomes in the eyes of the students a tool with practical application within new business development. Theories of innovation and business modelling are taught together with strategic design so that students can implement them while developing ideas and designing concepts, services or product proposals. There is a great emphasis laid upon the business plan as well as the business model. Students not only should be able of developing, describing and evaluating a business plan or a business model but they also should be able of designing a proposal for a new business and then convince different stakeholders that their business concept is worth funding. They should be capable of demonstrating the commercial potential, strategic potential, innovative strength and technological feasibility of their business idea. All things considered, these two master programmes can be classified as making part of the process world from Neck and Green's (2011) framework. Here, similar to the process world, planning and prediction are the main capabilities while the business plan is the champion.

Looking back to all the different programmes teaching entrepreneurship at AAU, it is easy to observe that the majority of them approach entrepreneurship through the process world. Also a quite significant percentage is represented by programmes approaching entrepreneurship through a combination of two of more worlds. This is not at all uncommon, as Neck and Greene (2011) also argue. The exact distribution of the approaches to entrepreneurship within AAU study programmes can be seen in the figure below (Fig. 5).

Figure 5 Entrepreneurship education at AAU



(Source: created based on the curriculum of each study programme and Neck and Greene's (2011) framework)

### 2.3.4. Cross-disciplinary semesters

Besides the full-time study programmes, Aalborg University provides one-semester modules that students can choose to take as an option to an internship or a semester abroad. Two examples of such modules which contribute to entrepreneurship education at AAU are the Creative Genius semester and the New Venture Creation semester. Both are cross-disciplinary modules available for 3<sup>rd</sup> semester master students with various academic backgrounds, experiences and cultures.

The Creative Genius semester aims to teach the students how to apply their discipline specific knowledge in a more creative way; as a creative genius who can innovate and renew the field of study. During the semester students have the possibility to collaborate with public or private organizations, to work on their own start-up or to work on a self-defined practical or theoretical problem. Students taking the Creative Genius semester are trained within a creative environment which allows them to come up with ideas and build up on others' ideas on command. They don't only make use of the creative environment but they are also taught how to set up such an environment and train others on creativity. They learn how to master the creative processes in both theory and practice and then use them to renew the existing methods and theories in their own field of knowledge. With all these abilities on board students are prepared to become creative geniuses of their own fields.

The study environment on the Creative Genius semester is different than pretty much all the other study environments students encounter during their education. It is unique because it is

meant to enhance creativity, originality and the students' potential for making an impact in their own field of study. The usual activities to which students participate during this semester are the following: daily training sessions in creativity, problem based learning with a strong focus on creativity, collaborative work on individual assignments, active participation and also lectures. Specific tools are used during this semester to facilitate both teaching and learning; these are: The 3D Didactic, The Creative Platform and The Training Program for New Thinking. By using these tools students are not only taught about the creative genius but they actually receive training in becoming creative geniuses. Each teaching day during the Creative Genius semester is different but they all are a mixture of lecturing, individual work, collaborative work and practical exercises. Literature is used for reflection at the end of each day but students never have the possibility of reading the literature before classes. This helps them participate actively and be aware of the subjects covered during each teaching day.

As previously mentioned, during this semester besides the other possibilities, students can work on their own start-up. If they make this choice, their problem area will be about developing a new idea for a product, service, organization etc. The company could be one they recently started or one that they plan to start. They will work on their problem, namely the start-up, individually and in collaboration with their colleagues so that at the end of the semester they have at least one if not several ideas ready to be put into practice. Working within a cross-disciplinary environment will provide the students with the opportunity of gaining insight from other fields and combining knowledge in new ways. Even during the times students work within groups the focus will always be their own development as a creative genius within their field. To be able to do that, a number of days within the semester their collaborative work will be guided but they will also have to organize themselves collaborative work in classes and outside of classes.

The other semester, New Venture Creation, is also a cross-disciplinary elective module designed for master students irrespective of their academic backgrounds, experiences, and cultures. It was created for those eager and with a desire to learn how to start a new venture and what it takes to succeed in such endeavor. Different from the Creative Genius semester, this one is purposely aimed at fostering entrepreneurship and entrepreneurial spirit across Aalborg University. It is a platform created with the goal of inspiring master students to take on, cultivate, and apply entrepreneurial knowledge, skills and abilities to the process of creating their own new ventures. Here working on their own start-up is not an option for

students as in the case of the Creative Genius, but the very purpose of all activities taking place during the semester.

Students taking the NVC module are trained in spotting and creating business opportunities, assembling teams and also acquiring the necessary resources to pursue the indentified opportunity. They also learn how to design a business model and develop a business plan which will further on be used to pitch the business idea to potential investors. They are as well taught how to negotiate business deals so they could sell their new idea or venture at the highest price.

The NVC module can be best described as a mixture of lectures, workshops, seminars, group work and group presentations, business game simulations, video material, as well as creative and team-based processes, which are facilitated by the staff. The main topics within this module are: Opportunity spotting, Team work and negotiating, Business modeling, Business planning and Reporting, presenting and pitching. These topics were designed in order to provide the students with a hand-on experience on the process of new venture creation. They are meant to develop students' entrepreneurial skills and abilities in creating, developing and pitching new business ideas. More than that, they provide students with certain tools within strategy, marketing and finance which will help them build viable and sustainable business models.

The two one-semester modules described above are very different and yet similar. They are different in the sense than one of them focuses strictly on new venture creation while the other has a broader view which includes new venture creation but it does not have it as sole purpose. Since they have different objectives, the teaching methods and the desired skills and abilities students should assimilate are also different. But these differences can be easily converted into similarities, at least to some extent. For example spotting and creating opportunities from the NVC module can be associated with the new ideas generation from the Creative Genius module. Pitching ideas to investors from NVC could be associated with collaborative work within the Creative Genius. They are based on the same principles but they are used in different contexts. When students have to create opportunities they actually have to generate new ideas. Similarly, during the collaborative work students have to pitch their ideas to one another because they are coming from different disciplines; indeed they are not pitching to attract investors but the activity in itself is the same for both cases. So maybe the

knowledge in terms of theories is different for these two modules but a lot of the skills and competences students assimilate are the exact same.

If it were to categorize these two modules within Neck and Greene's (2011) framework, the Creative Genius would be included in the new world proposed by the two scholars, while the New Venture Creation would be included in the process world. Even though many of the skills students gain from the two modules are similar, when analyzed in their entirety, the Creative Genius and the New Venture Creation emphasize different aspects of entrepreneurship.

The process world approach seems to be the most popular among AAU study programmes and as Neck and Greene (2011, p. 59) argue, "perhaps the process world is so popular to teach in because we can". Since there is no agreement on whether entrepreneurship can be taught or not and neither on the best ways of teaching it given that we agree on it being teachable, it seems like an approach focusing on processes, "from an education perspective, is the closest we can get" (Neck and Greene, 2011, p. 59). Teaching students how to write a business plan, how to do market and financial analysis or how to gather funds in order to start a business is more at hand than teaching them how to think like entrepreneurs or how to use creativity in order to come up with a new idea for a product or service.

Another explanation might be that AAU students are desired to actually start new ventures. The interest seems to be not only in creating awareness about entrepreneurship and in teaching students how to think like entrepreneurs but in actually providing them with a specific set of competences which they could use to make actual steps towards becoming entrepreneurs. The perfect example of a course specifically designed within the process world approach is the New Venture Creation module. As its description says it is designed to foster entrepreneurship and entrepreneurial spirit across Aalborg University. Its name says it all; it is meant to teach students how to create a new venture. The objective seems to be having more people who have received education and training in entrepreneurship and are able to create more value through new business creation both for themselves and other people.

# 3. METHODOLOGICAL FRAMEWORK

# 3.1. Methodological awareness

According to the theory developed by Arbnor and Bjerke (2009), there are three methodological views specific to the social sciences: *the analytical view, the systems view* and *the actors view*. Throughout their efforts of searching for answers to hypothesis and problem formulations, scholars adopt either one, either a combination of these views to interpret reality and science.

Two main paradigms are standing at the basis of the above mentioned views: *the functionalist paradigm* and *the interpretive paradigm*. The functionalist paradigm argues that reality consists of systems and subsystems which are defined by their relation to the whole, while the interpretive paradigm claims that reality is a social construction defined by the actions of its actors. Each of the two main paradigms can be divided in several sub-paradigms or *perspectives*. Taking the interpretive paradigm as example, some of its sub-paradigms would be: social constructivism, socials phenomenology or pragmatism (Arbnor & Bjerke, 2009, p. 144, 166, 391).

From all the concepts presented above, when choosing the methodological view, the researcher has first to explore what are his ultimate presumptions of reality (Arbnor & Bjerke, 2009, p. 10-15). Defining the ultimate presumptions is the first step towards defining the entire methodological approach of the study. The outline of the methodological approach of social science studies, which applies to this study as well, is presented in figure 6 and it will be further described below.





(Source: Arbnor and Bjerke, 2009, p. 17)
# **3.1.1. Ultimate presumptions**

Ultimate presumptions, as described by Arbnor and Bjerke (2009), are specific to each and every individual and are influenced by one's background and environment. They are in constant movement due to their dependency on the individual's experiences and accumulated knowledge. It takes long periods of time for ultimate presumptions to develop but once they are present they have great influence over the actions and problem solving methods of the individuals.

As researcher in this study, my ultimate presumption is that *reality is a social construction* defined by its actors and dominated by the actions in which the actors engage. In a similar way, organizations are created by its actors and are also dependent on their actions; they cannot act on their own, only their individual members can (Arbnor & Bjerke, 2009, p. 41, 75, 132-161).

In other words said, my view over reality is that what surrounds us, as actors in reality, is the direct result of our own ultimate presumptions and experiences. This view is what impedes me, as researcher, from being objective in terms of what reality is. In the attempt of understanding reality, I must become part of it. As researcher in this study, I will exert an influence over the study field, while the study field will do the same for me. The collected data will be of subjective nature but as new meanings and new understandings of certain contexts will be uncovered, the data will become objective facts (Arbnor & Bjerke, 2009, p. 19, 144-146).

# 3.1.2. Paradigm

Arbnor and Bjerke (2009, p. 424) define the paradigm as:

"A philosophical and theoretical framework of presumptions and guiding principles which are governing knowledge and the creation of knowledge, but which cannot be empirically or logically tested".

Guba and Lincoln (1994, p. 108) bring a more pragmatic way of defining the paradigm. They suggest that it can be explained by answering the following 3 sets of questions:

1. *The ontological question:* What is reality? When is reality? What should be known about reality?

- 2. *The epistemological question:* How do we acknowledge knowledge? What is the relationship between the researcher and the collected knowledge? How is truth acknowledged?
- 3. *The methodological question:* How does the researcher go about gaining knowledge and insight into what reality is?

As it has been already established, for this specific study the approach is subjective and the researcher is part of the investigated reality. This indicates that the study is conducted by following an *interpretive paradigm*, with the following three dimensions.

- the ontological understanding: reality is defined by its actors and their actions which stem from their ultimate presumptions;
- the epistemological understanding: knowledge is dependent on individuals;
- the methodological understanding: the approach is qualitative and the researcher immerses into the investigated reality.

# 3.1.3. Methodological view

Being already settled that reality is socially constructed, the methodological view of this study cannot possibly be another one than *the actors view*.

Conducting research through the actors view means understanding reality as a social construct defined by its actors and the interaction between them. Such interaction takes place through language so comprehending reality means comprehending the language and making use of it by engaging in dialogues with the actors (Arbnor & Bjerke, 2009, p. 41).

With this view over reality, as being socially constructed, it becomes impossible to engage in research from a completely objective perspective. The goal is not the development of a general and absolute theory; with the actors approach, the goal is to gain a deep understanding of reality and to create deeper knowledge about the phenomenon in focus (Arbnor & Bjerke, 2009, p. 54).

Following the theory of Arbnor and Bjerke (2009) and the specificity of this study, the actors view seems to be the most appropriate one to adopt. In order to understand the reality in focus, dialogues with the actors will be pursued. By interviewing individuals that are part of the investigated reality a deep understanding of this reality is expected to be gained. Besides

understanding the general picture, a deeper knowledge about the specific phenomenon that this study has in focus will be generated.

# 3.1.4. Operative paradigm

In almost every case, in order to conduct a study, a development plan is needed. This plan is also known as the operative paradigm and it is made out of two phases: the engagement phase (dialogue/participation) and the distancing phase (interpretation). Specific to every study and dependent on the methodological view that was chosen, there are certain ambition levels that guide the research process; they are outlined below (Arbnor & Bjerke, 2009, p. 184-185).

### **Ambition Levels**

# a) Pre-understanding

This level, as it can be easily grasped from its name, is meant to create a pre-understanding of the subject under research. For this specific study the pre-understanding phase happened when the literature review on the topic was conceived as part of a previous project. The present research started by analyzing the information already available from the project previously mentioned.

The knowledge gathered in the pre-understanding phase allows the researcher to think further about the main components of the research which are to be covered in the understanding phase (Arbnor & Bjerke, 2009, p. 140, 184-185).

# b) Understanding

In the understanding phase, new knowledge is generated by investigating the reality under study. In the present study, a series of interviews will create a deeper understanding of the subject in focus. Semi-structured interviews of 30-50 minutes with AAU students and professors will be used to observe how diversified entrepreneurship education is at AAU and what its implications for the students involved in it are. The interviews will also help in detecting some of the current shortcomings of the way entrepreneurship is taught at AAU.

The information gathered in this phase makes it possible to compare this study to similar ones in order to observe the generalizability of the findings. Besides this, answers to the problem will be provided by analyzing all the data. Otherwise said, this entire process enables the creation of objective knowledge from subjective interpretations (Arbnor & Bjerke, 2009, p 140-141).

#### c) Post-understanding

In the post-understanding phase the researcher explores other perspectives which could be taken into consideration once the study is complete (Arbnor & Bjerke, 2009, p. 141). For this specific study the post-understanding phase will materialize in a set of recommendations in regards to how entrepreneurship teaching could be improved at AAU. Future research possibilities on the subject will also be presented.

# 3.1.5. Study area

The focus of this study is laid upon a certain type of education, namely entrepreneurship education. As the discipline-specific philosophy says, education can be seen either as a knowledge acquiring process either as a field of study (Frankena et al., 2002). Here entrepreneurship education is analyzed in its quality of field of study but given that at least the one working on this project gains new knowledge, it can easily be considered a knowledge acquiring process as well.

## 3.2. Research design

There are numerous research designs from which to choose when conducting social research, but for this specific study the single case design will be adopted. The reason for this choice stands in the fact that the study is focused on entrepreneurship education and its diversity within *a specific* educational institution - Aalborg University. The nature of data used in this project, namely interviews with individuals that have taken or given entrepreneurship courses at AAU, also constitutes a reason for choosing the single case design. In other words said, entrepreneurship education at AAU becomes the case to be studied in this research and the interviews are the means to collect all the information regarding this case.

A case study, by Yin's (2009) definition, is "...an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2009, 18).

According to Yin (2009), case study research is a strong research strategy when compared to other like experiments, surveys or the analysis of archival information. The reason behind this is the wide variety of evidence that can be analyzed when conducting a case study research. The type of evidence chosen for this study, interviews, could be accompanied by documents, artifacts or observations.

When choosing the single case design, the case to be studied has to fit one of the five categories: a critical case, an extreme/unique case, a representative/typical case, a revelatory case or a longitudinal case (Yin 2009, 47-49).

The present research has in focus circumstances and conditions of a certain type of education made available by a certain educational institution. The purpose of this study is to produce information about the learning experiences and outcomes of "the average entrepreneurship student". This student's learning activity can very well take place at Aalborg University. Offering a full range of undergraduate, postgraduate and PhD study programmes Aalborg University covers different areas like, engineering and science, health science, humanities, social sciences and many others. It encourages research through different groups and circles and it is also involved in different kind of cultural and social activities both at the local and national level. Taking all these into consideration, Aalborg University appears to embody all the characteristics of 'the university' so it can be easily categorized as a representative/typical case.

Analyzing single case studies, as Yin (2009) argues, brings some limitations to the research, of which he mentions: case studies take too much time, they do not follow certain procedures, they might influence the direction of the findings, there is little basis for generalization etc. Disclaiming Yin's limitations and other scholars' critiques regarding case study research, Flyvbjerg (2006), qualified them as misunderstandings and proved that case studies are a necessary and valid research method in social sciences.

## 3.2.1. Case study protocol

A case study research needs a protocol to be followed. According to Yin (2009), the protocol incorporates the instruments as well as the procedures and general rules of the research. Having and following a protocol when conducting single case study research not only increases the reliability of the study but also guides the researcher in the process of data collection and analysis (Yin 2009, 79).

The case study protocol comprises the following sections: overview of the case study, field procedures, case study questions and guide for the case study report (Yin 2009, 81-82).

a) Overview of the case study

As the name itself says, this part of the study protocol, presents the general facts about the study. It describes the issues in focus, the reasons behind the study, possible outcomes and other similar information (Yin 2009, 82). As all these details can be found in the *Introduction* of this paper; repeating them here is unnecessary.

# b) Field procedures

It has been already settled that data for this study is collected by interviewing students who have taken entrepreneurship courses at AAU as well as professors who have given entrepreneurship course at AAU. More details about the field procedures are presented in a later section: *data collection technique*.

# c) Case study questions

The most important part of the case study protocol is represented by a set of substantive questions reflecting the line of inquiry, namely the case study questions (Yin 2009, 86).

For the present case study, the questions are the following:

- 1. What would be the definition for entrepreneurship education personalized for AAU?
- 2. What different elements of entrepreneurship are taught at AAU? Which one of them is emphasized the most? Why?
- 3. What is the main goal of entrepreneurship education at AAU?
- 4. What influence has entrepreneurship education on the students' behavior and career trajectory?
- 5. Did entrepreneurship education help the students acquire the necessary skills to start up a business? Do any of the students own a business now?
- 6. Did entrepreneurship education made the students act entrepreneurial without necessarily becoming self-employed? Did any of the students become an intrapreneur?
- 7. Are any of the students regular employees without any entrepreneurial activity?
- 8. Why are they in such situations? Does it have any relation to entrepreneurship education? Is it a set of courses they took? Is it because of the way courses are structured? Is it because of the teaching methods?

These questions are to be kept in mind and not asked directly during the interview. By asking other questions which indirectly provide answers to these questions as well, the interviewer avoids influencing the interviewees' responses. Throughout the interview, these case study questions will guide the interviewer; they will not be asked directly in order to prevent inducing to the interviewees certain answers that the interviewer might have thought of (Yin 2009, 87).

### d) Guide for the case study report

There are three key components the guide for the case study report should have: the outline, the format and the audience of the case study report (Yin, 2009). Since this study is in fact the final project within my master studies, the outline and format must fit the university's requirements. As for the audience, it will consist of my supervisors and the censor.

# **3.2.2. Data collection technique**

Since this study seeks to show the diversity of entrepreneurship education at AAU and the influence this certain type of education has on individuals, qualitative research methods seem to be the most appropriate to utilize.

The qualitative research methods most commonly employed in academic research are: ethnography, case study, action research and the generic qualitative method. For all these methods, the data collection techniques are more or less similar. Irrespective of the method, be it ethnography, case study or action research, the most popular data-gathering techniques are the following: observations, interviews and focus groups. There are of course, other less common but nonetheless useful techniques like document analysis or key informants which most of the times are used to triangulate the data already collected through one of the main methods mentioned above.

For this specific study, out of the aforementioned techniques, interviews have been chosen as means to collect the needed amount of data. They are one-on-one question-and-answer sessions between the researcher and his subjects which reveal the worldview of the interviewee. They are widely used in qualitative research due to the great amount of information they provide. The main reasons for choosing interviews in this study are the following: they generate rich data, they are an easy way of gaining insight into the interviewees' perceptions and values and the generated data can be analyzed in different ways. Gaining insight and understanding the phenomenon under study is very important in this

research so face-to-face interviews are the most appropriate means of data gathering to use (Ritchie &Lewis 2003, p.138).

The effectiveness of the managed verbal exchange, also called interview, is strongly dependent on the communication skills of the individual asking the questions - the interviewer (Clough & Nutbrown, 2007). Among these, the most important are: clearly structuring the questions, active listening, pausing appropriately and encouraging the interviewee to talk freely (Clough & Nutbrown, 2007). Besides communication skills, the interpersonal skills are also of great importance. The ability of the interviewer to establish rapport and inspire trust makes the interviewees feel comfortable and respond in a natural and relaxed manner (Opie, 2004). With all these skills the interviewer should "*make it easy for interviewees to respond*" (Clough & Nutbrown, 2007, p.134).

When categorizing interviews a good point to start is by choosing where they can be placed between the "unstructured" and "structured" poles. According to this categorization there are three types of interviews which can be used while carrying out research: *the structured interview, the semi-structured interview* and the *unstructured interview*. Out of these three types, the semi-structured interviews will be used here for both students and professors. In order to argue this choice all the three types will be shortly described below.

The *structured interviews*, characteristic to the quantitative research, involve one person (the interviewer) asking another person (the interviewee) a list of predetermined questions about a certain topic. The interviewer plays a neutral role and acts casual and friendly without inserting his or her opinion in the interview. All respondents are asked the same questions in the same way so the interview becomes very easy to repeat ("replicate"). To make sure the data is concise and to reduce the researcher bias the structured interview must follow a strict protocol which requires a substantial amount of pre-planning.

The *semi-structured interviews* are usually preferred in qualitative studies. Compared to the structured interviews, the semi-structured offer more freedom to the interviewer. Even though there is an interview guide to be followed, it is different from the protocol specific to the structured interviews. In this case there still is plenty of room for the researcher to explore the answer to one question but asking other questions which are not necessarily in the interview guide. Clarifications or additional information in relation to a certain topic found to be interesting can be requested without jeopardizing the quality of the study.

The *unstructured interviews*, situated at the opposite end from the structured interviews, are the most relaxed ones out of the three types. The protocol or interview guide is replaced here by a checklist of topics to be covered. For this reason this type of interview resembles a natural conversation and provides an enormous amount of data. They are used most of the times in two categories of qualitative studies: ethnographies and case studies.

Out of all the techniques, two others could have been used for this research: observations and focus groups.

*Observations* are notes about an event, a portion of an event or a group of events that are under study. They can be taken by one or several observers but usually when observations are employed for research, several observers are preferred to participate. Because each of the observers views the event from a different angle, having multiple observers increases the reliability of results. There are three types of observers: passive, active and participant observer. The type of observer to be adopted is dependent on each specific study (James et al., 2007).

*Focus groups* are actually group interviews which are more effective but at the same time less flexible than interviews. For this technique a moderator is needed, and that is usually the role of the researcher. He has to make sure that everyone has the time and space to answer the questions and also that the discussion is not dominated by one or two persons. The main objective is to obtain high-quality data in a social context which allows each individual to consider their own views in the context of the views of others while also bringing new ideas and perspectives.

As previously mentioned, semi-structured interviews are used for all the subjects of this study, be they students or professors. When using such a tool to collect data Wagner et al. (2012) suggest and interview guide should be elaborated. This helps in defining the line of inquiry and in establishing the main points to be covered during the interview.

The basis of the interview guide is represented by the research question and the information that is already available in the literature on the topic (Wagner et al., 2012). A literature review becomes very useful at this step of the research and in this case it has been already written for a previous project.

There are a few key parts that an interview guide must contain: an introduction about the study and its purpose; ethical issues like informed consent and permission to tape record and a

few concluding statements. Besides these, of even greater importance are the interview questions (Wagner et al., 2012).

Even though it might not seem as a crucial part in the preparation of the interview, creating the interview guide is actually a very useful task to undertake. It stimulates the researcher to think ahead about the topics to be covered during the interview and it helps him explore deeper and deeper with every new question selected for the interview. It is also an exercise that assists the researcher in the data triangulation process by providing trustworthiness to the findings (Wagner et al., 2012).

For this study the interview guide (Annex 2) was conceived in a previous project (Nacuta, 2014) but since then some adjustments have been made. The key elements as described by Wagner et al. (2012) are all included. There is an introduction which presents some general facts about the study, followed by the forms concerned with the ethical issues which make room for the questions and a concluding statement.

Since the questions are crucial for the interview guide but especially for the interview itself, a short description of how they were created follows next. Open-ended questions were chosen for this study due to the flexibility they offer. They allow spontaneity in the interaction between interviewer and interviewee. For the interviewer the flexibility stands in the fact that he does not have to use the same wording for each interview of the study while for the interviewee it stands in the fact that he is free to respond in his own words, which are most of the times more complex than "yes" or "no". This type of question also creates a more friendly interview environment with a less formal relationship between interviewer and interviewee. Responses tend to be elaborate and in great detail which in turn allows the interviewer to tailor new sub questions that generate even more data. It gives the interviewer the possibility to probe the initial responses of the interviewees by asking "why" or "how" questions. Another reason for choosing open-ended questions is that they evoke responses which are meaningful and culturally salient to the participant, unanticipated by the researcher and also rich and explanatory in nature.

# **3.2.3.** Sampling strategy

When deciding the sampling strategy, there is a series of questions the researcher should ask himself right at the outset:

• What are the research objectives?

- What is the target population?
- Who should be included in the sample?
- Who should be excluded from the sample?
- What sampling technique(s) should be employed?
- How are the data to be analyzed?
- What data collection techniques should be employed?
- What are the sample criteria?
- What size should the sample be?
- How long will the interview be?
- How should potential respondents/participants be recruited?

With each and every question, the sampling strategy is shaped to fulfill the study's requirements. All questions have their role in creating the strategy but the most important one, from where all starts, is the one related to the objectives. Once these are decided upon, all the other questions find their answers rather easy.

Knowing exactly what the objectives are is crucial as they are the ones determining the trajectory of the research. Even though in qualitative studies the objectives may be refined as the research progresses no extreme changes occur (Wilmot, 2005).

The objectives of this study which have been already mentioned in the *problem formulation* section can be easily deduced from the questions standing at the basis of the research. By learning from individuals who have followed or taught entrepreneurship courses at AAU how diversified this type of education is within this specific university and what impact it has on students' behavior and career trajectory, new knowledge on the topic of entrepreneurship education will be generated. This will not only add to the existing knowledge on the topic but will also help improving entrepreneurship education at AAU. Otherwise said, because it asks a "what" question as well as a "why" question, this study's goals are to add something new to what is already known about this topic as well as to produce a set of recommendations on how entrepreneurship programmes and courses at AAU can be improved.

Besides the objectives of the study, the sampling technique employed to collect the data in order to reach those objectives is also of great importance. Qualitative research, of course, has different sampling techniques than quantitative research. It uses non-probability sampling because the purpose is not to produce a statistically representative sample or to draw

statistical inference. In qualitative research a phenomenon only has to appear once in the sample (Wilmot, 2005).

The sampling technique most commonly used in qualitative research is *purposive sampling*. This technique, also called purposeful selection, specifically selects the subjects because they are considered to be the ones able to teach the researcher the most about the subject of interest (Boeije, 2009).

While employing purposive sampling, the number of subjects chosen to take part of the research is less important than the criteria used to select them. The selection is based on the specific characteristics of individuals which most of the times are chosen to assure the sample population's diversity and breadth (Wilmot, 2005).

There are different ways purposive sampling can be approached when conducting research and they are dependent on the type of study. With its roots in Glasser and Strauss (1967) "grounded theory", a quite common form of purposive sampling is *theoretical sampling*. The grounded theory is based on the idea that theory is generated through a continual and repetitive process of sampling, collection and analysis of data until theoretical saturation occurs; which means that no new knowledge emerges (Glasser and Strauss, 1967). The repetitive aspect is what matters most in the case of theoretical sampling design. By employing this repetitive process the researcher has the opportunity to analyze the data while the sampling process still takes place. It gives him the chance to make small but important changes in the emphasis of the sample design to ensure the reliability of the generated results (Wilmot, 2005).

When research constraints are in place, other similar but less resource consuming sampling strategies can be used. No matter what the strategy though, previous knowledge of the population under study is crucial.

The technique used for this specific study is purposive sampling but due to time constraints it will not be possible to go in such depth as theoretical sampling does. Since the problem formulation clearly specifies that the subjects in focus are AAU students and professors, this is obviously the first point to start with. Specific to this sampling strategy, the sampling, collection and analysis of data will overlap allowing for adjustments to be made along the way. Certain sampling criteria will be followed and there is also a sample size to be established but they will be shortly described below.

Deciding the sampling selection criteria means establishing a set of characteristics the sample population needs to reflect in order to address the research problem. To decide these characteristics a review of the literature on topic should be undertaken (Wilmot, 2005). For this study the literature review was conceived in an earlier project (Nacuta, 2014) but, as it can be observed in the *Theoretical framework* section, it was enriched with more recent articles on the topic. There are different criteria which can be selected; they can be based on demographic attributes, behaviors, attitudes or other characteristics which need to be prioritized according to each study and to each sampling technique.

The most important criterion for this study is for the subjects to be AAU students or professors. The next in line refers to the type of education the subjects have taken (students) or taught (professors); they must have taken or taught at least one entrepreneurship related course, or they must have graduated (students) from or coordinated (professors) an entrepreneurship programme.

The length and the intensity of the interviews are other elements influencing the design of the qualitative sampling strategy. Some researchers prefer long interviews, others prefer shorter ones but in most of the cases the long interviews provide more data than the others. Depending on each specific study, a small number of long interviews or a big number of short interviews have to be conducted in order to reach the goals. Even though the researcher goes for a big number of interviews, this number will not actually be that big. That is caused by the fact that in qualitative sampling a phenomenon only has to appear once to be of value. Also, in qualitative studies the aim is for depth and breadth and analyzing great numbers of in-depth interviews will not only be unmanageable but also unnecessary (Wilmot, 2005).

In this case, 30-50 minutes interviews with around 10-15 subjects should be enough to provide the necessary data. If during the data collection, due to the new findings, more interviews will be needed all the efforts will be concentrated towards that.

#### 3.2.4. Data analysis method

In order to analyze the data collected through interviews, Glaser and Strauss's (1967) *grounded theory* will be applied. Grounded theory, also referred to as the *constant comparative method*, is a general methodology for developing theory that is grounded in systematically collected and analyzed data. By a continuous interplay between data collection and data analysis, the theory is developed during the actual research. In other words said, in

grounded theory, generating theory and doing social research are seen as two parts of the same process (Glaser 1978, 2).

The analysis process when applying grounded theory methodology consists of creating codes and categories, grouping them into themes and then creating hypotheses about the participants' experiences. The experts' opinion must also be taken into account so a literature review is required.

When analyzing data by applying grounded theory, the primary method is a continuous *coding* process. The process will start with the *open coding* which means examining data line by line in order to observe certain actions or events. The goal of this phase is to refine and specify any borrowed extant concepts (Strauss and Corbin, 1998). The next phase is called *axial coding* and it has as purpose the creation of conceptual connections between a category of codes and its subcategories. Then, all the concepts and their sub-concepts are further defined by *selective coding*, "an integrative process of selecting the core category, systematically relating it to other categories, validating those relationships by searching for confirming and disconfirming examples, and filling in categories that needed further refinement and development" (Strauss and Corbin, 1998).

Otherwise said codes and categories will be sorted, compared and contrasted until saturation will be reached; meaning that no new codes or categories will emerge.

According to Creswell (1998), the analysis process in grounded theory can be described as following:

- 1. Open coding: examining the properties and dimension of the data in order to categorize the information;
- Axial coding: pinpointing a central phenomenon, examining causal conditions, creating strategies, identifying the context and defining the consequences of the central phenomenon;
- Selective coding: defining the story line and incorporating the categories of the axial coding in the story; proposing the hypotheses;
- 4. Discussion of findings and contrasting them with extant literature.

The analysis of the data collected in this study will be conducted following Creswell's (1998) description of the grounded theory methodology. It will start with the open coding of each interview transcript, then the axial coding which will be followed by the selective coding.

When saturation will be reached, the findings will be summarized together with a comparison between them and the already existing literature.

To ease the process of coding, a data analysis computer software called NVivo will be used. NVivo was created for qualitative researchers that work with very rich text-based information where a deep analysis is required. It is meant to help researchers organize and analyze nonnumerical or unstructured data. It can be used to classify, sort and arrange information, to examine relationships between data and also combine analysis with modeling. It allows the researchers to test theories, identify trends and cross-examine information in various ways. It is used to apply a wide range of research methods like grounded theory, discourse analysis, conversation analysis, ethnography, phenomenology and many others.

# **4. RESEARCH FINDINGS**

With the purpose of providing an answer to the questions around which this research revolves, thirteen interviews with both students and professors from Aalborg University have been conducted. The goal was to find subjects from as many programmes providing entrepreneurship courses as possible and gather all the relevant data needed to unravel the specificities of entrepreneurship education within Aalborg University. By talking to different people involved in this type of education, both educators and students, the diversity of approaches to entrepreneurship education at Aalborg University as well as their impact on students were brought to light. A table with the number of interviewees and their specific programme or course can be found below.

Name of the course/programme	Number of students	Number of professors
Creative Genius	-	1
Entrepreneurial Engineering	2	1
MIKE (Innovation, Knowledge and Entrepreneurial Dynamics	2	-
Public Innovation and Digitizing	-	1
Software Engineering	4	1
SEA (Supporting Entrepreneurship at Aalborg University)	-	1

Table 1 Number of interviewees by the specific course/programme

The interviews have been analyzed by following the steps presented in the methodology section. To apply Glaser and Strauss's (1967) grounded theory, a data analysis computer software called NVivo was utilized. NVivo and its features allowed for each interview transcript to be examined in order to categorize the information into codes. Also called open coding, this process implied analyzing the data line by line in order to observe certain actions or phenomena. The next step, called axial coding, implied taking the codes created in the previous step and grouping them together into categories for central phenomena to be pinpointed, causal conditions to be examined and consequences to be defined. Selective coding followed. All the categories previously generated were grouped into themes in order to define the 'story line'.

Since there are two different types of respondents, namely students and professors, the interviews for each type were analyzed separately. Three main themes emerged: *concepts*, *course or programme specificities* and *student characteristics*. In the figure below (Fig. 7) the student themes are illustrated for a better understanding.

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Figure 7 Student themes

(Source: created using NVivo and the interview transcripts)

It can be observed that both the student and the professor themes can be expanded to show the codes they incorporate. For example the 'concepts' theme shown in the figure includes the following: 'entrepreneurship', 'entrepreneurship education' and 'entrepreneurship vs intrapreneurship'. Entrepreneurship education, in this case, has a '+' in front which means it can be expanded to show some more codes. Similarly, all the other themes can be expanded in order to explore the information coded under each of them. The sources and the references of each code, category and theme are also displayed. The sources are represented by the interview transcripts while the references are selections of specific words, groups of words or phrases from the transcripts which have been coded under each specific code, category and theme.

# 4.1. Professor themes

Two types of interviewees have been selected for this research in order to gather data about entrepreneurship education at AAU: professors and students. All the data gathered from the interviews have been coded for each of the two groups of interviewees under three main themes: *concepts, course or programme specificities* and *student characteristics*.

To keep the respondents' identity private, the professors will be referred to from now on as P (professor) followed by a number while the students will be referred to as S (student) also followed by a number. Each respondent's interview recording and transcription, which are named in the same way, can be found on the CD attached.

### 4.1.1. Concepts

When analyzing the professors' interview transcripts the following 'concepts' have been identified: *creativity, Danish education system, innovation, entrepreneurship, entrepreneurship education* and *entrepreneurship education at AAU*.

# 4.1.1.1. Creativity

Four out of the five interviewed professors talk about creativity and try to define it as well as to connect it with entrepreneurship. One of the subjects defines creativity "as novel, useful, with a social impact; so it could be an idea, a product, a service, a thought, anything" (P1). He also talks about the theories standing behind creativity which argue that "creativity is about combining knowledge in new ways" (P1). As for the connection between creativity and

entrepreneurship he claims that "creativity defined in the terms of the creative genius is very close to entrepreneurship if the purpose is societal development but it's less related to entrepreneurship if the purpose is organizational development" (P1). With a different view over creativity, another interviewee says: "the assumption that innovation requires creativity is a bit overrated" (P3). As he explained, having a problem which requires a solution acts like a trigger for people's creativity. That is why he doesn't consider creativity a big issue. When talking about the goals of a specific study programme, another interviewee argues that even though a lot of entrepreneurship education programmes provide creativity courses and put a lot of emphasis on innovation, the goal of the study programme in discussion "was to say that this (entrepreneurship) is not only about creativity and innovation" (P5).

# 4.1.1.2. Danish education system

Even though it was not necessarily in the focus of the research and no specific questions have been asked about it, some of the professors brought into discussion the Danish education system and the way it influences entrepreneurship education in Denmark. On one hand they about different initiatives which encourage entrepreneurship and talk structure entrepreneurship education and on the other hand they talk about the ways in which the Danish education system hinders entrepreneurship. One of the subjects actually presents his involvement in the reorganization of entrepreneurship education at the local and national level. As he explains, there are a lot of programmes which are meant to help students start up their own companies and to encourage them to follow this career path. Also on a national level a lot of work is done to create "a model of progression within entrepreneurship education" (P5) so that each level within the education system should have incorporated specific entrepreneurship knowledge. He gives the example of the primary school where children should be accustomed to working with ideation or creativity up to the point where it becomes the usual routine so that once they start at the university they should not need some more courses and practice on that. But as he says "so far it seems that no matter where you are in the educational system there are the same things that we are doing; you work with ideation, with business planning, with business modelling" (P5). Different from this view, where the Danish education system encourages entrepreneurship, there is another view where the Danish education system hinders entrepreneurship. As one of the interviewees explains "the way we arrange education in Denmark or maybe globally is counterproductive in terms of innovation. I think you can actually do a course about entrepreneurship and innovation where you get people to read all the right theories but the way you arrange the course and the way you arrange education actually keeps them away from any kind of entrepreneurship and innovation" (P4). He claims that the Danish education system spoils the students by allowing them to spend too much time inside the system where they are always being told what to do. As he says, you cannot expect someone to act entrepreneurial when all this time spent in the education system you have constantly told that person what to learn, when to learn, what do to and how to do it.

### 4.1.1.3. Innovation

Innovation, another 'concept' identified while coding the interview transcripts, was quite a few times brought into discussion as adjacent to entrepreneurship or creativity. These concepts are somehow seen by the interviewees as interconnected and most of the times when they talk about one of them, they also bring into discussion the other. An example of such situation would be the following: "I think you can actually do a course about entrepreneurship and innovation where you get people to read all the right theories but the way you arrange the course and the way you arrange education actually keeps them away from any kind of entrepreneurship and innovation" (P4). Talking about the way entrepreneurship education happens at Aalborg University, another interviewee associates innovation with creativity: "One of them is very much inspired by the creative platform type; innovation courses where it's a lot of clapping hands and somehow digging down into your own backpack of knowledge to use both knowledge gained from education but also knowledge gained from other things" (P5). With a different opinion, another respondent nullifies the connection between innovation and creativity: "the assumption that innovation requires creativity is a bit overrated" (P3). Nonetheless no questions were asked specifically about innovation and no interviewee tried to define it but a lot of times it was brought into discussion as something worth mentioning.

#### 4.1.1.4. Entrepreneurship

Getting closer to the main theme of the study, the next 'concept' identified in the interview transcripts is entrepreneurship. Trying to define it through the lens of creativity, one of the interviewees says that in this context, entrepreneurship still has the individual in focus but for the purpose of societal development and maybe individual development as well but not for the organizational development. He also says that if it were to evaluate entrepreneurial activity by the number of business registrations, there wouldn't be so many entrepreneurs among his students but if it were to evaluate it by the number of ideas generated with the purpose of societal development then things would be different. Another interviewee shortly presents the way entrepreneurship was approached in the past and how it is approached nowadays. He

argues there is a shift in the way entrepreneurship is approached in the sense that traits of the entrepreneur and certain characteristics he might or might not have are no longer in focus. More important nowadays as he explains, is to "get out of the building" and "try and test stuff" (P5). He also says that the statistical data about the so-called successful entrepreneur who should be male, 40 years old, with a higher education and experience in the industry might not be valid anymore. As he explains "entrepreneurship is like poker: the one who's the best prepared wins, maybe not on the short run but always on the long run" (P5). Entrepreneurship in the eyes of this interviewee is a profession and as he argues people can learn how to be good entrepreneurs by using certain tools and methods. For this reason he thinks "we should focus on the teachable or learnable aspects of entrepreneurship" (P5).

## 4.1.1.5. Entrepreneurship education

Entrepreneurship education is another 'concept' discussed with the interviewees. At some point during the interview they were asked to define entrepreneurship education and also to explain how they think entrepreneurship should be taught. For some of the respondents defining entrepreneurship education in a concise manner was quite challenging but they all managed to at least explain how they think entrepreneurship should be taught. Acknowledging how difficult it is to actually come up with a definition, one of the respondents explained that entrepreneurship education should mix theory and application of theory and teach students how to actually do things. He sees it as "a mix of creation and learning theories and finding strategies" (P2). Another interviewee talks about different entrepreneurship study programmes he came across while taking part in entrepreneurship related conferences and events. What he experienced in relation to the majority of study programmes is that the ones providing them "are not very ambitious on what they teach the students, they are ambitious on how many students would actually form a company" (P3). Referring specifically to the Danish level, one of the respondents skips giving his own definition but talks about the definition that most of the Danish universities use as foundation for their entrepreneurship education programmes. Sharing his knowledge and experiences from working with promoting entrepreneurship nationwide, this respondent explains that "on a Danish level most of the universities somehow work with the definition from the Danish Foundation for Entrepreneurship which explains it as some sort of learning how to identify and act on opportunities and work with opportunities in a value adding way" (P5). A slightly different opinion has a respondent who says that he is not completely sure entrepreneurship

can be taught at the university. As he argues "you can read the books and you can learn the theories but it's also to a high degree a matter of personality" (P4).

# 4.1.1.6. Entrepreneurship education at AAU

From entrepreneurship education in general, the discussion focused specifically on Aalborg University so the next 'concept' identified while coding the data is entrepreneurship education at AAU. Expressing his opinion about the way entrepreneurship is taught at Aalborg University, one of the respondents says: "I don't think any of us are wrong in the way we are teaching it" (P1). The issue he finds as dominant at Aalborg University is that the programmes are too rigid in the way they are structured. As he explains there are certain subjects that some students might want to study but in order to do that they have to give up to other subjects which they might find important as well. "You have to pick, do you want to learn about entrepreneurship, do you want to learn about business modeling or business planning or do you want to learn about creativity? You can't get all of it. I think that's the problem" (P1). A solution to this, in his opinion, would be to have more elective courses from which students could choose each semester. Another interviewee, also from the educators side, talks about his experience in working with students and staff at the university for both the implementation of projects which could turn into start-ups and for the development of courses which have or could have entrepreneurship built into them. As he explains, when the university started working with entrepreneurship, it was a lot of trial and error. "We were trying different aspects of entrepreneurship education, we were trying out different workshop types and we were sort of tumbling" (P5). Over the years things started to improve, certain activities have been shut down for good and new ones took their place up to the point where it all came down to one single thing: supporting entrepreneurship. Under that umbrella, as the interviewee calls it, there are different activities but they all have the same purpose: support entrepreneurship, innovation and business development. Entrepreneurship education at Aalborg University, in the interviewees' perception, falls into two main topics: creativity on one side and business development/business planning on the other side. The creativity side is about combining knowledge gained from education with knowledge gained from other sources while the business development side is about using a set of tools in order to create a business; it can be the business plan or the business model canvas or other tools. Another point this respondent makes related to entrepreneurship education is that at Aalborg University it is not something on the side of one's education but it is something within the education. He relates this kind of education with the problem-based learning specific to Aalborg University and points out that the majority of things students do because of the problem-based learning provide them with competences they need in order to start up a business. As he explains it: "You know how to create value because you somehow start out by identifying a problem, working with the 'problem owner' and working on solving that problem.(...) You're accustomed to work within groups, you learn how to somehow be analytical in the way that you try to persuade them (the group partners). So you also know how to work with, let's say 'customers' or 'stakeholders'" (P5). When asked about the goals of entrepreneurship education at Aalborg University, the same interviewee answered that the goal is not to have a specific percentage of students starting up a business, at least not right after graduation. The goal in his view is to "strengthen the opportunity or chances of having entrepreneurs" (P5). He also suggests that the focus of entrepreneurship education should be on "the teachable or learnable aspects of entrepreneurship" (P5). The same opinion is shared by another interviewee who mentions that having the number of start-ups created by students as criterion for success in entrepreneurship education is naïve.

# 4.1.2. Course or programme specificities

As previously mentioned, there were three main themes identified while coding the interview transcripts. The information coded under the first theme has been already discussed about so it is time to move to the second theme: 'course or programme specificities'.





(Source: created using NVivo and the interview transcripts)

Under this theme, the following codes (Fig. 8) have been identified: *collaboration with organizations outside AAU, course placement, main characteristics, knowledge provided* and *future plans.* 

The educators interviewed for this research are coordinating different courses or programmes at Aalborg University so the information provided by each of them is very specific since they are all talking about their own course/programme.

### 4.1.2.1. Collaboration with organizations outside AAU

Collaboration with organizations outside AAU is a very common thing, as the interviewees' responses show. For some of the programmes, working together with a company in order to solve a problem might not be mandatory but it is very much encouraged and in most cases students choose to do it. The interviews reveal there are two ways collaboration with organizations outside AAU takes place. One way is by inviting entrepreneurs and other business people in class for them to interact and exchange knowledge and experience with the students. The other way is to have groups of students work on a real issue that a certain organization is facing. The organization's problem will become the foundation of a project in which students will use theory to find one or several solutions to be implemented. For the first case, when entrepreneurs are invited in class, they are usually asked to talk about their own experiences and then take questions from students for them to be able to relate the practical information provided by the entrepreneurs with the theoretical knowledge provided by the educators. As one interviewee explains it: "We have 3 or 4 guest-lectures with people from different start-ups coming from our department. And they give a presentation of how they started and what their business looks like now and the students are then asked to make a business model canvas for this particular company and then identify eventual problems or options" (P3). That is the usual way of working with guest-lecturers. Another way is to ask them to form something similar to an advisory group. There is at least one programme, where students were asked to come up with a business idea and then pitch it to the experts, namely the invited entrepreneurs, for them to evaluate the idea and make suggestions on how it could be improved. The second case, where students have to work on a problem that an organization confronts with, is a bit more complex. There are programmes where students have to find on their own the organization to work with but there are also other programmes where the educators arrange all the meetings and take care of all the practical things so that students can focus only on solving the problem. One of the interviewees' argues why educators should be the ones in charge of the practical details of the collaboration: "it's my experience that if the students are going to arrange the collaboration and organize it, it's not going to happen because they don't have the time and they don't have the skills. (...) The students should only be concerned with actually using the things they are learning in order to solve a problem" (P4). From the interviewees' responses, the solutions students come up with are implemented in a lot of the cases. They don't just work on a problem for the sake of it, there is a sense of closure to their work once their solution is implemented.

#### 4.1.2.2. Course placement

Course placement is the next thing considered important by the interviewed professors. Indeed it is not a concern for those coordinating a full entrepreneurship related programme but for the ones coordinating only an entrepreneurship course, its placement can be crucial. From the interviewees' experience, the best placement for an entrepreneurship course is in the 9th semester also known as the third semester during the master programme. The main reason behind placing these courses right before students leave the university is that they are both mentally and academically mature. They are mature enough to know their interests and see the importance of the knowledge provided in these courses and they are also mature enough in terms of expertise in their own fields of study. They have the theories and concepts from their own fields and they can combine them with the theories and concepts from entrepreneurship in order to generate ideas which could turn into start-ups. Otherwise said it "is about teaching them (the students) how to apply that knowledge, from their own programmes, in a creative, novel way. That's the basic of it" (P1).

# 4.1.2.3. Main characteristics

The main characteristics of each course or programme discussed during the interviews have four sub categories under which the information was coded: *course principles, methods, success criteria* and *possible career options*. When it comes to **course principles**, obviously they vary from one course to the other. Some courses are based on two, other on three and other on four main principles depending on their complexity. For instance, at the foundation of the Creative Genius course there are four elements: task focus, horizontal thinking, parallel thinking and no experience judgment. Task focus is about thinking at nothing else but the task itself; it is a prerequisite for being creative and that is why it stands at the basis of the Creative Genius course. Horizontal thinking means combining knowledge in new ways; that is also a specificity of being creative. Parallel thinking, as the interviewee explains it, "means that

everybody with whom you are working thinks in the same direction at any given point" (P1). Finally, no experience judgment teaches students how to react when they are judged. It does not mean that there wouldn't be judgment but it means that students will learn not to feel judged when they express their opinions and ideas. All the other courses or programmes have some guiding principles which not only structure the course/programme but also create a basis for the evaluation of students.

Methods of teaching and evaluation are also very specific to each course but they have some commonalities as well. For the teaching methods, the greatest commonality is the problem-based learning which is specific to Aalborg University. In most cases, problem-based learning is adapted to the specificity of the course, but the basic functions of it are still there. An example would be the Creative Genius course where students "are collaborating a lot but they have their own problem, they make their own decisions, they make their own projects and in the end they are examined individually" (P1). Making a correlation between entrepreneurship education and problem-based learning, two of the respondents claim there is a coherence between entrepreneurship theories and problem-based learning. As one of them says it: "once we have a problem, we start thinking (...) then if we give a challenge to our students and tell them that this is something we would like to do but we can't, then if they start from there, they will create ideas" (P3). The same interviewee explains: "the basic philosophy in how we approach entrepreneurship teaching in this course and the basic model for teaching at this university are hand in glove, they match perfectly" (P3). From the methods that are very specific to a certain course, the activities taking place within the Creative Genius course are worth mentioning. As the professor coordinating this course explains: "A group of exercises are about learning to accept making mistakes. (...) So I would tell them to come up with a category, any category; let's say things in the fridge, chair types or window producers or show producers or things in the sky or any other things like that. Then they take turns to fill out that category. So if it was things in the fridge it would be: milk, juice, butter and other. (...) So eventually they would take more than two seconds to come up with something and they are too slow. So they have to stop and say 'Yes, we made a mistake!'" (P1). The other courses have some more common methods. Some are very traditional and imply only regular lectures, other invite guest lecturers to bring some diversity in class while other send the students out to work with real problems within organizations. Business plan creation, discussions and group work, projects and presentations, case studies and workshops are other methods professors use within the entrepreneurship courses they teach.

When it comes to evaluation, the methods are not so different. For all the programmes and courses evaluation usually takes place at the end of the semester. Students have to prepare a semester project and present it in an oral defense. Based on the content of the project and the quality of the defense the project is graded according to the 7 mark scale. There are some exceptions when students are also evaluated during the semester. A case like that would be the Creative Genius course where students have to hand-in an assignment or even two every week. These assignments are not graded on the 7 mark scale; they are passed or not passed. As the coordinator of the course explains: "they are not evaluated in terms of good or bad. It's ok or not ok; so it cannot be very good or very bad, it can be passed or not passed" (P1). Another exception would be one of the full programmes where students are evaluated during the semester through a series of reflection essays. The coordinator of the programme argues why this evaluation takes place: "that's to force them to think about coherence and relations between different subjects and models applied to their projects" (P2).

Success criteria are distinct from course to course and programme to programme. The Entrepreneurial Engineering programme has as success criterion the jobs students get after graduation and the quality of their work within those jobs. They also look at how many startups students create but it is not the main or the single criterion. Since this programme is a new one there are other criteria like: "Can we attract good students? That would be a prerequisite for us. Do the students have a good time? Do they feel that they learn a lot? Are they equipped in a way that they could have a broad range of possibilities?" (P2). The Creative Genius course has as success criterion the social impact students make during the course and after they finish it. "So it's not to make money, it's not to start a business, not to make individual or organizational profit maximization" (C.B, Annex X). In the case of the Public Innovation and Digitizing programme the success criterion is represented by the degree to which students are able to contribute to the public sector in Denmark. "They should actually be able to produce something new, something that makes a difference for the public sector in Denmark" (P4). For the Software Engineering programme a success criterion was quite hard to define. The programme coordinator mentioned that having the number of start-ups students create after graduation as success criterion would be naïve. But he also says that: "of course you want value creation on a broader scope and you want people to gain experiences before they start-up their own company so they know the market and they know what competition they're facing and so forth" (P3).

Linked to the success criteria specific to each programme there are the possible career options for students. Of course different programmes means different career options. The Entrepreneurial Engineering students have the possibility of working on establishing their own business even before they graduate so working on that afterwards would be one of the career options. Other options could be: jobs that support business development, entrepreneurship or intrapreneurship or jobs within public service consultancies. The Software Engineering students could "go into design, some into implementation, some will become managers and so forth; some will work in small companies, some in big companies" (P3). Students from Public Innovation and Digitizing are supposed to contribute to the transformation of the Danish public sector and they should work within jobs which are highly innovative and with a high degree of complexity and uncertainty. An interviewee with a more general view over AAU students and not on students from a specific programme says that "you can take a university degree and then you can take a position within the government or within a company; that's fine and we're really good at addressing that career path. But if we could get more and more focus on the fact that you could also start up your own company and that is also actually a good career path for you, I think that could be interesting" (P5).

### 4.1.2.4. Knowledge provided

The next category under the course or programme specificities theme is knowledge provided. All the information here is organized under the following codes: causation and effectuation theory, the business model canvas, the business plan and theoretical vs practical knowledge. Sarasvathy's (2001) causation and effectuation theories are brought into discussion by two of the respondents. One of them explains how they are used in the course he is teaching while the other mentions them as being part of the shift in the way entrepreneurship is approached nowadays. More specifically, the respondent explaining the use of these theories in his course is actually associating the causation theory with the waterfall model from software projects and the effectuation theory with the agile model. This association makes it easier for the software engineering students to understand the two entrepreneurship approaches as they are already accustomed to working with the software models previously mentioned. The business model canvas is mentioned by the same two respondents who talked about the causation and effectuation theory. One of them uses it when teaching entrepreneurship to students, the other brings it in the discussion when he is asked to talk about the way entrepreneurship education takes place at Aalborg University. The reason for choosing this tool when teaching entrepreneurship is very well presented by one of the interviewees: "we use Osterwalder's business model canvas because that gives our students a vocabulary and an ontology to understand what a business is, that they can use whether they become entrepreneurs or not" (P3). In line with this argument, the other respondent adds that this tool is preferred by most educators and business people because it is more open to changes and improvements. The business plan, as the interviewees' responses show, has a place in the majority of the entrepreneurship courses but not so much emphasis is laid upon it. Professors teach the students about it but they usually prefer working with the business model canvas because of its coherence with the current economic reality. As one of the interviewees explains: "That's also because Aalborg University is in North Denmark where there's not so much venture capital and there are not so many head-quarters here so the idea from the traditional business planning that you make a strong proposition and then you go find some funding does not really sound too relevant" (P3). Besides these very specific theories, models or tools each course or programme provides students with either theoretical either practical either a combination of the two types of knowledge. Between the ones in discussion there is no pure theoretical or pure practical course. As the responses show, all course coordinators are trying to make a combination of the two with an emphasis on the practical side. They want their students to be able to do things but to still have in mind the theories behind those things. The goal educators have for their students is for them to be able to apply theory in practice and also to be able to see the limitations of theories and challenge them if necessary.

### 4.1.2.5. Future plans

Finally, the last category under the course or programme specificities theme is the future plans educators have for their course/programme. It was not intended to bring this subject into discussion but apparently talking about the course or programme they are in charge of gave the interviewees some ideas of how they could be improved. An exception is the Creative Genius course where the idea of improving was already there before the interview. It is not exactly an improvement made to the existing course as the idea is to start the Creative Genius for professionals. What could be considered as an improvement to the actual format is the idea of collaboration between the students taking this course and the professionals who have a similar background. For the Entrepreneurial Engineering programme the coordinator mentions there still is quite a lot of room for improvement as the programme is very new. An idea he had during our discussion was to do a simple thing and expose the students to examples that would inspire them; to bring someone relevant in front of the students and get them to tell their story and motivate students to act in a similar direction. In the case of the Software Engineering programme, the entrepreneurship course coordinator admits as well that some things could be changed in his course. His idea of improvement is the following: "Well the structure now is that the CEO comes in and talks about his experiences and the students are asking immediate questions and what I could do is actually send the students off to the group-rooms for half an hour or something like that and then come back and get feed-back" (P3). With a more general view, one of the interviewees talks about improvements which could be made to entrepreneurship education at Aalborg University in general. He talks about the fact that some solutions should be found to convince students that starting up a business is a career path as good as working within government or within a company. Moreover he thinks: "what we need to do is to find some way that we could of course inspire those who want to start their own company in doing so, but somehow give the rest of the students the tools so that when they are 40 they know how to spot that opportunity and they know how to act on it" (P5).

#### 4.1.3. Student characteristics

The last of the three themes identified while coding the educators' interview transcripts is 'student characteristics'. Information has been coded here as follows: *abilities, diverse vs similar backgrounds* and *entrepreneurial propensity*.

#### 4.1.3.1. Abilities

Depending on each specialization, students have different abilities which combined with the new knowledge provided by the entrepreneurship education courses or programmes can become even more complex. One of the respondents, which has a more general view over AAU students, mentions they are "some of the most attractive students for companies, especially our engineering students" (P5). As he explains, AAU students add value where they are working and that is why a lot of them are head-hunted right after they graduate. Another interviewee characterizes the students as being "very gifted people" (P3) which in his opinion would have quite a lot to lose if they would be allowed to completely specialize. AAU students are seen by another respondent as very good at dealing with complexity but quite poor at dealing with uncertainty. Efforts are made to change this, but it seems like a lot of them still have unrealistic expectations about what will happen after they graduate. The students with a technical background are perceived as the ones willing to make prototypes and create things; they are the ones passionate about the practical details and less concerned about

theories. Different from them, other students, namely the ones taking the Creative Genius course have a greater propensity towards challenging existing theories and practices.

### 4.1.3.2. Diverse vs similar backgrounds

Depending on each course or programme brought into discussion, students' backgrounds have been identified either as similar, either as very diverse. For example in the case of the Creative Genius course students come from all kinds of disciplines, starting with sports science, continuing with nanotechnology and ending with music therapy. This kind of diversity is not seen in the Entrepreneurial Engineering programme, for example. Over there the majority of students come from similar backgrounds, technical-related. For the Software Engineering students the situation is similar. As the coordinator of the entrepreneurship course says it: "the large majority of our students only have courses from this department; so we own our students, they are our subjects from day 1 until they finish" (P3).

# 4.1.3.3. Entrepreneurial propensity

When it comes to entrepreneurial propensity, it is quite difficult to categorize students in terms of their background or their current specialization. That varies a lot from each and every individual to the other. Talking about a class of undergraduate students one of the interviewees approximates that only 10% of the students "say they always had some dream of starting up something. And those are the ones going the extra mile" (P5). As for the other interviewees, they cannot be as specific. They limit themselves at saying that there are students who have always been interested in starting up a business and that there are also other students who have never considered entrepreneurship as a career option.

# 4.2. Student themes

Identically with the main themes identified in the professors' interview transcripts, the student themes are the following: *concepts, course or programme specificities* and *student characteristics*. All the relevant information provided by the students during the interviews has been coded under these three themes. They all incorporate different categories and codes that will be elaborated below.

#### 4.2.1. Concepts

Under the 'concepts' theme the following categories have been coded: *entrepreneurship, entrepreneurship education* and *entrepreneurship vs intrapreneurship*. Different from the professors, the students do not necessarily come with definitions of these concepts but they rather talk about their experiences in connection with the concepts.

## 4.2.1.1. Entrepreneurship

Since all the interviewed students have taken at least one entrepreneurship course, they all talk about the theoretical interaction with entrepreneurship. In a smaller number, there are others who had some kind of practical experience as well. None of them gives a full definition of the concept but some mention different characteristics of it. For instance one of the students, while trying to explain the general area of his qualifications, says: "entrepreneurship has such a wide range of abilities into it, ranging from engineering to marketing, to even me from human sciences but who had a lot of practical experience which actually taught me that our main activities are networking and team building and trying to see how we can use our mutual skills instead of just our singular skills" (S1). He starts by saying something quite general and somewhat theoretical about entrepreneurship but then he continues with things he knows about entrepreneurship from his practical experience with it. Another one of the interviewees talks about a different characteristic of entrepreneurship while telling about his dream of starting a business one day: " I had a little dream that I would start my own business because it would mean great freedom and I think I have the skills and the knowledge to go out and implement an idea and earn money on it and be my own employee" (S3). So he talks about the freedom that comes together with entrepreneurship and the possibility of earning money out of something that you are passionate about. But again, the intention is not to define entrepreneurship but to talk about his experiences related to entrepreneurship. Other interviewees bring into discussion the entrepreneur and some of his characteristics as well. Trying to argue whether he is or he is not an entrepreneurial person, one of the students says: "Because, of course that's also the way I understand the definition of the entrepreneur; it's about being creative and risk-taking" (S7). He only mentions two characteristics that he sees as important, he doesn't give a full or a very extensive definition but what he says it's sufficient to understand how he perceives the concept.

#### 4.2.1.2. Entrepreneurship education

The information coded under entrepreneurship education is actually describing the factors that motivated the students to choose this type of education as well as the perceived utility of entrepreneurship education. Among the interviewees there are some which had the entrepreneurship course as mandatory so in their case we cannot talk about the reasons for choosing this type of education. For the other though, the reasons are various. For three of the respondents, choosing entrepreneurship education was motivated by the idea of starting up a business. As one of them says it: "Even before I had the entrepreneurship course, I had a little dream that I would start my own business" (S3). The other two, which have been studying together at the university both through their bachelor and master programme, explained that the idea of starting up a business occurred to them sometime in the 4th semester. That is when they decided they should enroll in an entrepreneurship related master programme. Other interviewees' motivation to choose an entrepreneurship related master programme was the bachelor programme he followed. He explains that the bachelor in Innovation and Business awakened his interest in entrepreneurship. As he describes: "I really liked the way we were dealing with our project work and everything but we did not have the entrepreneurial angle within this study and that's what I was looking for" (S5). Another interviewee mentions as motivating factor a talk he saw online. Someone with the same background as him was talking about converting your passion into a business and make use of the things which come natural to you instead of forcing yourself into something of which you have no clue. Slightly different from all the above is a student who had as motivating factor a real problem that his mother, who works as a nurse, was facing at her work place. Something which started as a "fun experiment" like the interviewee calls it, turned into an invention which now has a full patent and which will soon be the central element of a start-up. As the interviewee explains "because of that experience (of inventing something), I suddenly found out that I lack something in my original education. I needed to have something more" (S1). At this point the second motivating factor intervened: a professor who knew about an entrepreneurship programme that would fit the interviewees' needs and who urged him to apply.

When it comes to the perceived utility of entrepreneurship education, the students' opinions are quite diverse but they all see it as being useful one way or another. Some of them bring forward the different tools that entrepreneurship education provided them with and which will help them in their efforts of starting up a business. They talk about the business model canvas, the elevator pitch, different data analysis techniques and other similar things which already

helped them in different situations. A very good example of the usefulness of entrepreneurship education and more specifically of the business model canvas is shortly described by one of the students: "The business model canvas I even used for the presentation for the venture fund and they started clapping when they saw it. They didn't expect students to know that one" (S1). Also talking about the competences gained from the entrepreneurship programme he follows, another student explains: "I could also say that I've learned about how not to do or how not to start up a business in some areas. It definitely gave me inspiration about going new ways and also it gave me some insight on how to actually start up" (S7). Even one of the students who doesn't have any plans on starting up a business but had to take the entrepreneurship course, recognizes its utility: "I think it's a good thing that is part of your education. You at least get some tools and if you decide to start a business you don't have to start from scratch" (S2).

### 4.2.1.3. Entrepreneurship vs intrapreneurship

Under the entrepreneurship vs intrapreneurship code there is not very extensive data but it is worth mentioning as few of the interviewed students have considered trying to become intrapreneurs instead of entrepreneurs. They argue intrapreneurship comes with both advantages and disadvantages but they see it as a valid career option, especially right after graduation. Invoking past experience within a start-up one of the interviewees talks about his plans: "I've focused on larger companies where maybe I'm going to focus on intrapreneurship, so within the company, and try to go up some ranks and try that game, so to say, and see how that works for me. Because I've already tried some of the challenges and the things that are happening in a start-up company and I know several people that have started their own company so I know how hard it is" (S3). He acknowledges there are other challenges that an intrapreneur faces but he is willing to try that out and see how it works. Turning this situation the other way around, another interviewee explains how he would act if he would work within an organization and he would have a great idea that his superiors would refuse to fund: "I would give myself some time to actually try to convince the organization as a whole to go this way. (...) But if it's a really rigid structure within the organization and no one from the middle level is heard then I would say that I could after some time, if no one is listening to me, really start up my own business and really go for this idea" (S7).

#### 4.2.2. Course or programme specificities

Being characterized by broadness in terms of data, this theme incorporates four categories: *assimilated knowledge, expectations, satisfaction* and *problem-based learning*.

#### 4.2.2.1. Assimilated knowledge

The counterpart of 'provided knowledge' from the professor themes, 'assimilated knowledge' gathers data about the most important concepts, theories and tools that entrepreneurship education provided to the interviewed students. Even though the respondents come from different programmes across Aalborg University, the majority of them talk about three things when it comes to assimilated knowledge: effectuation theory, the business model canvas and the business plan. Of course, together with Sarasvathy's (2001) effectuation theory they also learn about the causation theory but the emphasis is laid upon the first of the two. As one of the students explains, they are taught that when starting up a business "you should grab the chances that you have instead of trying to do something or enforce something that is not obvious or very straight ahead" (S8). They learn about the traditional approach, namely causal thinking, and then they get the novel alternative, effectual thinking. Similarly, they learn about the traditional business plan, its components and its utility but they also learn about the business model canvas. Again, more emphasis is placed in the majority of programmes on the business model canvas and as it turns out, it is the right thing to do. Proving this is a situation presented by one of the interviewees: "the one who I'm working with, (...) had done a business plan, the classic business plan; the first thing he (one of their mentors) said when he saw that was: "I'm not going to look at that at all. There's no point. It can't adapt. It won't change." and so on. Then I made the business model canvas even though I was thinking it was too loose, as you pointed out, is not that extensive, but then he (their mentor) actually smiled and said: "That I can work with. That means you're going to adapt. That means you have understood some of the critical issues but you're willing to do innovation and you are not static from day 1" (S1). Another aspect discussed during the interviews regarding the knowledge assimilated is the nature of knowledge. As students' responses show, the tendency across all programmes is to combine theoretical and practical knowledge. The theory taught during the semester through different methods, be it traditional lectures, guest-lectures, simulations or other things, has to be applied by students in a project which will be orally defended and graded by the 7 mark scale. In terms of students' preferences, the practical dimension champions. They all are aware that without theory there would be no basis for practice but they all seem to prefer working on some practical issue instead of reading the theories.

### 4.2.2.2. Expectations

Students' expectations in regards to the entrepreneurship course vary depending on each programme but also on each student's previous experience with entrepreneurship. For instance, one of the respondents, who studies Software engineering and who never thought of starting up a business explains that he was not very thrilled when he first saw the entrepreneurship course in the schedule. As he says it: "so I thought: oh, well I just have to get through this" (S2). He expected for this course to have very little relevance to him as he is not interested in becoming an entrepreneur but until the end of the course he realized that the knowledge he gained could be used in other areas as well. Another respondent, also studying Software engineering, describes how he did not expect from the theories taught within the entrepreneurship course to have practical applicability; but the course proved him wrong. Describing the Entrepreneurial Engineering programme, two interviewees share the same opinion in terms of expectations; they both anticipated more technical content. "A lot of us, I think, were wondering how it can be called Entrepreneurial Engineering if it had pretty much no engineering in it" (S5). As for the entrepreneurship part of the programme, they both agree that it exceeded their expectations especially in terms of the various kinds of knowledge it incorporates. Starting with the basic theories of entrepreneurship, continuing with creativity and innovation and then moving to business modelling, students actually get to apply all the theory in practice either through collaborations with real companies either in entrepreneurship competitions like WOFIE (Workshop for Innovation and Entrepreneurship which takes place every year). In the case of the Master in Innovation, Knowledge and Entrepreneurial Dynamics, the two interviewed students explain that they expected from this programme to provide them with the necessary knowledge to start up a business. As one of them explains, they did not expect to be taught about the specific steps to be taken when starting up but to gain "a broader view and some theories about how others have started up and actually get some ideas of how to structure the process maybe" (S6).

# 4.2.2.3. Satisfaction

Talking about their satisfaction in regards to the course/programme, the majority of students have no criticism to bring but rather praise the way entrepreneurship was taught to them. When asked if the knowledge gained from the entrepreneurship course influenced them in any way, all the students agree that it has changed either their perspective on certain things, either

the way they act in certain situations. Probably the one with the most to say in terms of satisfaction is the student who will soon start a business as a result of this education. During the interview he explains: "I think the overall experience of the programme has changed me quite a lot. I keep seeing things in another light" (S1). Also when asked directly if the programme had any influence over who he is and where he is today, his answer is very concise: "Yes. That's a big yes" (S1). Even the students who don't have any plans on starting a business agree on the high quality of the entrepreneurship course. One of them says: "It's been very motivating, entrepreneurship wise, to participate in the course. It has helped me develop and it has given me some understanding of some problems, good and bad. I know what kind of challenges there are and the amount of work needed when starting up your own company. So yes, it has affected me. But I have chosen not to pursue the entrepreneurship career directly but apply for a job in bigger company" (S3). In terms of negative considerations regarding the entrepreneurship course, one student mentions that it shouldn't be mandatory, as it is in his case. Another one, talking about one of the full programmes, says that he would have preferred to have some more courses on executing entrepreneurial ideas and go deeper into business planning and business modelling.

#### 4.2.2.4. Problem-based learning

Problem-based learning, the method specific to Aalborg University, has found its way within entrepreneurship education as well, as the students' responses show. No matter if it is only a course or a full programme dedicated to entrepreneurship education, the principles of problem-based learning are still applied. Students work in teams to solve a problem using the theoretical knowledge gained from their education as well as their own practical experience. The greater the variety within a group, the greater the challenges and most of the times, the greater the results. Confirming that, a student tells his experience with problem-based learning and how it helped solve a real problem that his mother, a nurse, was facing at her workplace. Joining efforts with other two students, with different backgrounds, lead to the creation of a novel device which solved the problem and which will also constitute the main activity of a start-up. As the student describes "the story I have with the invention (...) if we just did our solo things, not being able to work together, as a problem based in a team we've never found this. There would have been no point in trying to identify that kind of problem because I would have tried to look into how would the nurses communicate perhaps, if I had to do it for a human science project; my twin would have tried to study, as a biologist, the liquid and how it affects the tissue and my friend, with accounting, would have tried to find the numbers, or
how much they would sell; but all of these together wouldn't solve the problem at all if we have tried to use our respective education. And because of the problem based learning and the team working... My story is a true testament to that, because without these we've never done it" (S1).

Problem-based learning, between others means working on real problems and because of that students are often encouraged to take as project work the problems faced by organizations outside the university. This kind of collaborations usually have very fruitful results, both for the students and organizations. Being part of such a collaboration, one of the students describes how he and his group started with a project that was meant to help a company find some local investors and ended up representing this company at the European Cleantech Challenge in Milano. As he says, they did not win the challenge but they went far enough to be noticed by an Italian company who is interested in buying.

Showing a different side of problem-based learning, two of the interviewed students describe what happens when you work within the same group for a long time. "If you are working in the same group a lot of times you usually fall into roles where this 'guy is the leader' and 'this guy is the creative one with all the ideas' and 'this guy knows a lot of theory' and stuff like that" (S2). With a more positive attitude, another student says: "even if you feel like you are the one that pulls the hardest or does the most for the group, you still keep learning from people, no matter if you're not on the same skill level" (S8).

#### 4.2.3. Student characteristics

The interviews with students revealed different information about their preferences in terms of jobs, their working experience, their aspirations for the future and other similar things. All of these have been coded under the theme 'student characteristics' (Fig. 9) which incorporates the following categories: *contact with entrepreneurship, employment situation* and *selection into entrepreneurship as a career*.

#### Figure 9 Student characteristics



(Source: created using NVivo and the interview transcripts)

#### 4.2.3.1. Contact with entrepreneurship

As the interviews show, some of the students have had contact with entrepreneurship even before starting an entrepreneurship programme or following an entrepreneurship course as part of their education. One of the respondents used to work within a start-up for 10 months and also participated in one of the editions of the Start-up Weekend. Another one was just about to start a new venture together with his group partner right after they graduated from their bachelor but unfortunately that did not happen. Also working together with two friends, another interviewee created a medical device initially supposed to be sold but which eventually turned out to be a great idea for a start-up on which they are currently working and which will soon be launched. All the other interviewed students might or might not have thought about starting up a business at one point but besides that and besides the entrepreneurship took place. No matter the previous contact with entrepreneurship or the aspirations of starting up a business one day, all the interviewees had to come up with a business idea as part of the entrepreneurship courses they have taken. They were all asked during the interview to shortly describe their ideas and they were also asked why they didn't go through with them. That is how a new subcategory of codes emerged: *impeding factors*. The main factors invoked as blocking the interviewees business ideas from moving forward and actually becoming start-ups are the following: fear of failure, lack of experience and resources, the fear of not being able to continue their education while working on starting up a business, someone else had the same idea and started before they got the chance to do it, an unprepared market, disagreement with the partners and finally, outside options like job offerings even before graduation. On the other side of the coin, the main *supporting factor* when deciding to start up a business mentioned by several respondents is some sort of social support students can get while working for their start-up. One of them explains how it works: "I don't know if you're familiar with the whole system; after we're done here we get paid if we are members of a union; they call it "dagpenge". There's basically a programme they did here at AAU where you actually could work on your business while receiving the money which you normally wouldn't, I think. You would only be paid half if you would actually start working in your own business and the programme would last a year, I think. So that would actually give you time to prepare your business" (S6).

#### 4.2.3.2. Employment situation

Students' employment situation is another subject brought into discussion during the interviews. Some of them are unemployed and have been that way all the time during their education, others have or had student jobs at the university or in some other places and others have been already head-hunted by some companies and they should start working a month after their graduation. One single student, the one who invented a medical device, is at the same time working on his start-up and as a bartender during the weekends.

#### 4.2.3.3. Selection into entrepreneurship as a career

When it comes to selection into entrepreneurship as a career, students' responses fit them into three categories: the ones who never thought of becoming entrepreneurs and who stick to that even after taking the entrepreneurship course, the ones who decided to follow an entrepreneurship education exactly because they want to become entrepreneurs and finally the ones who never thought of becoming entrepreneurs but the entrepreneurship course changed their perspective on that. Fortunately, there are no students who aspired of becoming entrepreneurs and got discouraged after following an entrepreneurship course/programme. None of the ones interviewed mentioned that studying entrepreneurship made them give up the idea of becoming entrepreneurs. On the contrary, some of them, who never thought of starting up a business, have a different view over this issue after studying entrepreneurship. As for those who would never consider entrepreneurship as a career option, when asked why, students replied that it's just simply not their interest to start a company. One of them explains what would convince him to take that into consideration: "I think I need some kind of assurance that whatever idea I have, would be somewhat successful" (S4). Out of the eight students interviewed only two entirely reject the idea of becoming entrepreneurs. Being somewhere in between the above categories, another one of the eight respondents mentions he doesn't abandon for good the option of becoming an entrepreneur but he thinks now it is not the right moment for that, at least not in his case. Another one, fitting in the last category, explains how he never thought of becoming an entrepreneur before the entrepreneurship course and how that changed after learning some of the basic aspects of entrepreneurship. Similar to the one mentioned above, this respondent also sees entrepreneurship as a possible career option for the distant future and not for the moment. Even though it is not a perfect fit, the student who invented the medical device also goes into the last category. He describes that even after creating the device he did not see himself as an entrepreneur. His initial goal was to sell the idea and move on with his plan of becoming a teacher or a consultant. Trying to convince him that this new device was the perfect product around which a start-up could be built, a professor from the university urged our interviewee to enroll in the Entrepreneurial Engineering programme with the hope that it will make him change his mind about selling the idea. As it turns out, this strategy worked very well. Not only he started considering entrepreneurship as a career option but he is actually at the moment very close to launching the start-up and officially become an entrepreneur. The other three respondents fit to the remaining category; they all enrolled in entrepreneurship related programmes because they want to gain the necessary knowledge to start up a business once they graduate.

### **5. DISCUSSION AND CONCLUSIONS**

Inspired by a few considerations which make reference to the diversity surrounding entrepreneurship education, this study proposed the following research questions: *How diverse are the approaches to entrepreneurship education within Aalborg University? What are the specificities and what impact does AAU entrepreneurship education have on its students?* 

To address the first question, Neck and Greene's (2011) theory regarding the different approaches to entrepreneurship was applied. The main reason for choosing this approach is the clear and very concrete classification they make. Another reason stands in the proposition they came up with to complete the classification, namely using entrepreneurship as a method itself in entrepreneurship education. As they argue, this would teach students how to think and act based on a set of assumptions and techniques that encourage creativity.

Using the information given by their specific curriculum, all the programmes that provide entrepreneurship courses have been categorized according to Neck and Greene's framework. As the figure below (Fig. 10) shows, 52% of the programmes teach entrepreneurship through the process world, 33% use a mixture of the process and the cognition world, 9% combine the process world with the cognition world, the entrepreneur world and the "new" world proposed by Neck and Greene (2011) and only 6% teach entrepreneurship solely by the "new" world. There are no programmes teaching entrepreneurship purely by the cognition or the entrepreneur world.



Figure 10 Entrepreneurship education at AAU

(Source: created based on the curriculum of each study programme and Neck and Greene's (2011) framework)

Apart from the full-time study programmes, there are also one-semester modules that students can choose to take as an option to an internship or a semester abroad. The two modules analyzed and categorized by Neck and Greene's (2011) framework are the Creative Genius and the New Venture Creation semester. The Creative Genius semester fits to the "new" world while the NVC semester fits, as the majority of AAU programmes, to the process world.

Having the majority of programmes approaching entrepreneurship through the process world has both positive and negative implications. The good thing about having this approach to teaching entrepreneurship is that students get to learn about the most important issues they have to take into consideration when starting a business. They get to learn what each type of investor is interested in and according to that, what parts of the business plan should be thoroughly considered. They get to learn how to predict the future of their business and to take actions that are in their best interest.

The downside of this world, as it is pointed out by Neck and Greene themselves, is that entrepreneurship is neither linear nor predictable, so acting as it if were and not being able to adapt and change could bring even business exit. Having the majority of programmes teaching entrepreneurship by this world might mean creating a generation of business and marketing analysts but not a generation of entrepreneurs. Students who are only taught about business planning and who have no knowledge about how an entrepreneur acts in thinks, for instance, might not ever be able of making the move and start up a business.

So if the goal of entrepreneurship education at Aalborg University is to teach the students how to become doers, maybe the majority of the programmes should try and adopt a different approach than solely the process world. A good combination, in my view, is that of the process and the cognition world and the good part is that a lot of the programmes are actually approaching entrepreneurship this way as well. A better mix, especially in terms of teaching methods, would probably be that of the process, the cognition and the "new" world proposed by Neck and Greene (2011). Teaching the main theories and tools of entrepreneurship by using methods which require applying them at the same time would, in my opinion, cohere with the goal of teaching students how to become doers.

To address the second question, thirteen in-depth interviews with both students and professors from Aalborg University have been conducted. The interviews have been structured to reveal data matching the teaching model for entrepreneurship education proposed by Fayolle and Gailly (2008). Since the emphasis goes on the specificities of entrepreneurship education and its results, out of the teaching model's two levels, only the educational level is approached here. Five dimensions are incorporated in this level: *why?*; *what?*; *how?*; *for whom?* and *for which results?*. Having these dimensions as well as the data retrieved from the interviews as a take-away point, Aalborg University's teaching model for entrepreneurship can be shaped.

The first four dimensions show AAU's entrepreneurship education specificities while the last dimension shows its impact on students.

To shape AAU's teaching model of entrepreneurship education, the main themes identified while analyzing the interviews must be confronted with the five dimensions proposed by Fayolle and Gailly (2008). The main findings describing the "why" dimension come from the professors' interviews. On the micro level, the main goal professors have when teaching entrepreneurship is to provide their students with the knowledge and tools that will make them capable of actually doing things. They want their students to be doers, as one of them says it. They want them to know how to combine different kinds of knowledge and apply theory into practice. When it comes to explaining the objectives of the course or programme at the macro level, most of the professors mention jobs. They want their students to take the knowledge gained from their education into jobs where they would support business development, make a social impact or create value on a broader scope. More than that, they want their students to be able to create something and choose entrepreneurship or intrapreneurship as a career. On the students' side, the "why" dimension is covered only at the micro level. The goal of entrepreneurship education, as seen by the students, is to provide them with the necessary knowledge to start a business. Only one of them thinks the issue at the macro level, to some extent. As he explains, entrepreneurship education should create entrepreneurs who will not only generate value for their own good but also for the good of society.

The "what" dimension which is focusing on the content of entrepreneurship education is covered by both students and professors in the codes: provided knowledge and assimilated knowledge. More specifically, the three main theories/tools taught within the entrepreneurship courses at Aalborg University are Osterwalder's (2010) business model canvas, Sarasvathy's (2011) causation and effectuation theories and the traditional business plan. A greater emphasis is laid upon the effectuation theory and the business model canvas as they have better results when applied in practice. The fact that two of the main theories/tools taught within the entrepreneurship courses are about planning, proves once again that the main approach to entrepreneurship at Aalborg University is the process world. The fact that Sarasvathy's theories who are concerned with the way entrepreneurs think, also occupy an important place within most of the courses, justifies why the second most utilized approach when teaching entrepreneurship at Aalborg University is a combination between the cognition world and the process world. Taking these facts into consideration, it is fair to say that the

information provided by the courses curriculum is in line with the information gathered through interviewing students and professors.

Concerned with the methods of teaching entrepreneurship, the "how" dimension finds its data mostly within the professors' interviews. The main teaching method used within the entrepreneurship courses is the same teaching method used for all the other courses at Aalborg University, namely problem-based learning. About the activities characteristic to this method and applied within the entrepreneurship courses students talk as well, but the ones going into details are the professors. According to them, problem based learning is in full coherence with the entrepreneurship theories. A lot of the competences students gain by learning through this method are in fact needed and used by entrepreneurs. Things like team work, being able to come with a value proposition, to convince different stakeholders to support your ideas and other similar abilities students gain while working for their projects, prove to be relevant for an entrepreneur. More specific methods used while teaching entrepreneurship at Aalborg University are: theory based lectures, guest lectures, business plan creation, discussions and group work, projects and presentations, case studies and workshops. Categorized by Mwasalwiba's (2010) work, the above mentioned methods are both passive and active. Since the passive ones are still championing entrepreneurship education in general, the fact that AAU uses a mix of the two types represents a step towards even bigger improvements.

The "for whom" dimension is illustrated by both students' and professors' interviews. As the interviewees' responses show, the audience of entrepreneurship education at Aalborg University is very diverse. There are programmes like Entrepreneurial Engineering where only students with technical qualifications are accepted and there are other, like the two modules, Creative Genius and New Venture Creation, which have no boundaries for the students' specialization. When it comes to the students' motivation for choosing this kind of education, all of those who had to make this choice invoke their aspirations of becoming entrepreneurs. Prior entrepreneurial exposure is not very common among the interviewed students but it isn't an admission requirement either. As for the socio-demographic characteristics of the students, they haven't been brought into discussion so it is probably not a very important variable. A bit more specific in terms of students' characteristics are the professors who argue that AAU students are very gifted people who are good at dealing with complex issues and create value through their work.

Finally, focusing on the evaluation methods and criteria within entrepreneurship education, the last dimension, "for which results" is outlined by the professors' interviews. The evaluation method for all the entrepreneurship courses is a project that students have to work on during the semester and then at the of it, present in an oral defense. Besides the project, some of the courses require the students to work on different kinds of assignments during the semester. In terms of evaluation criteria, these are strongly dependent on each course and its guiding principles. Each of the courses discussed during the interviews have up to four guiding principles which also represent the basis for evaluation. One general principle which would apply to all the discussed courses, refers to the way students think and act. As previously mentioned, one general goal professors have for their students is for them to become doers; they want their students to get out of the building and test stuff" (P5).

To summarize all the above, a rough definition of entrepreneurship education at Aalborg University would be the following: educational activity designed for individuals coming from different kinds of backgrounds, experiences and cultures, meant to teach them how to use specific business planning tools and entrepreneurial thinking theories, through problem-based learning and several other teaching methods, for the purpose of creating an elite capable of generating value both for individual and common purposes.

The above definition, which is a very broad one, leads to the following question: is there a point in trying to find a definition for entrepreneurship education that fits all the programmes across the university? My answer to that is no. I believe the main characteristics of entrepreneurship education across Aalborg University should be known and the five dimensions discussed above should be clearly outlined, but entrepreneurship education should keep its diversity within AAU. I believe each and every programme that incorporates entrepreneurship courses should keep teaching entrepreneurship by its own individual approach. Each and every programme should teach the students those aspects of entrepreneurship that are in their best interest and in coherence with their specialization. A very good idea though, would be to start taking into consideration students' aspirations and previous entrepreneurial exposure before designing an entrepreneurship course. Added to that, more chances of applying theory into practice should be granted to the students. A lot of theories and tools are taught, but students rarely get the chance to actually use them. Indeed, for one of the programmes, taking part to an entrepreneurship workshop is mandatory and for another one, project work in collaboration with organizations outside the university is

arranged by the programme coordinators, but for all the others, chances to apply the knowledge gained from the course are quite low. Besides the project work which applies to some extent the theoretical knowledge, students do not really "get out of the building and test stuff". Something should be done about that too. If there is no chance of sending all the students out to work with real problems, some other teaching methods should be employed. A few examples, from Mwasalwiba's (2010) work, would be: business simulations, games and competitions, study visits, real-life or virtual cases, role-play and even real venture setting up. Giving up the traditional teaching methods is not at all a good idea but complementing them with some more modern teaching methods cannot have anything but very good results.

Nevertheless, limitations have to be kept in mind when considering the findings of this paper. This study is limited by its cross-sectional data; the phenomenon under study is observed only at a single point in time, not across time. This prevents the assessment of entrepreneurship education programs' effectiveness and impact on students' career trajectory. Furthermore, even though this is a qualitative research and subjects can be selected according to the researchers' needs, the selection bias cannot be averted. Some of the interviewed students might have always had a predisposition towards entrepreneurship so of course their responses have been influenced by that. In a similar way, professors might have biased opinions about their students' abilities of becoming entrepreneurs, for example, and that again might have influenced their responses.

All things considered, I believe it is fair to say that the objectives of this study have been reached. By using some theories to structure the information gathered from individuals who have followed or taught entrepreneurship courses at Aalborg University, the specificities of this type of education, its diversity across the university and its impact on the students have been identified. All these findings add to the existing knowledge on the topic of entrepreneurship education in general but more important, help improving entrepreneurship education at Aalborg University. A suggestion for further research would be to target the programmes providing entrepreneurship courses at Aalborg University and analyze the actual impact of entrepreneurship education. An idea would be to try and reach contact with former students and observe how entrepreneurship education influenced their career trajectory. Otherwise said this study would have to look into how many students have used their education to start up a business; how many succeeded in their efforts and how many failed; how many are intrapreneurs and how many have consultancy jobs or other similar positions.

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# ANNEXES

# Annex 1: List of the study programmes incorporating entrepreneurship courses

# I. Bachelor programmes

No.	Programme	Course	Faculty	World
1	Construction Engineering/	Scientific theory and	Faculty of	Process
	Civil Engineering	ontronronourshin	Engineering and	world
	Civil Engineering	entrepreneursmp	Seienee	world
			Science	
2	Building and	Scientific theory and	Faculty of	Process
	Construction/ Civil	entrepreneurship	Engineering and	world
	Engineering		Science	
2				D
3	Building and	Scientific theory,	Faculty of	Process
	Construction	entrepreneurship and	Engineering and	world
		engineering training	Science	
4	Sustainable Energy	Scientific theory and	Faculty of	Process
	Engineering	entrepreneurship	Engineering and	world
			Science	
5	Export Technology/	Scientific theory and	Faculty of	Process
	Bachelor of Engineering	entrepreneurship	Engineering and	world
			Science	
6	Energy Civil Engineering	Scientific theory and	Faculty of	Process
		entrepreneurship	Engineering and	world
			Science	
7	Sustainable Energy	Scientific theory and	Faculty of	Process
	Technology	entrepreneurship	Engineering and	world
			Science	
8	Economics and Business	Innovation and	Faculty of Social	"New" world
	Administration	Entrepreneurship (elective)	Sciences	
			-	
9	Global Business System	Scientific theory and	Faculty of	Process
	Engineering	entrepreneurship	Engineering and	world

			Science	
10	Information Technology	Scientific theory and	Faculty of	Process
		entrepreneurship	Engineering and	world
			Science	
11	Chemistry and	Scientific theory and	Faculty of	Process
	Biotechnology	entrepreneurship	Engineering and	world
			Science	
12	Mechanical Engineering/	Scientific theory and	Faculty of	Process
	Civil Engineering	entrepreneurship	Engineering and	world
			Science	
13	Machine and	Scientific theory and	Faculty of	Process
	Manufacturing/ Civil	entrepreneurship	Engineering and	world
	Engineering		Science	
				_
14	Mechanical Engineering/	Scientific theory and	Faculty of	Process
	Bachelor of Engineering	entrepreneurship	Engineering and	world
			Science	
15	Nanotechnology	Scientific theory and	Faculty of	Process
		entrepreneurship	Engineering and	world
			Science	
16	Public Innovation and	Innovation and change:	Faculty of Social	"New" world
	Digitizing	entrepreneurship, service,	Sciences	
		product and process		
		innovation		
17	Health Technology	Biomedical engineering in	Faculty of Medicine	Process
		an organizational and	and Health	world
		corporate perspective		

# II. Master programmes

No.	Programme	Course	Faculty	World
1	Technology in Industrial Design	Business Development	Faculty of Architecture, Design and Planning	Process
2	Industrial Design	Business Development	Faculty of Architecture, Design and Planning	Process world
3	Computer Science	Entrepreneurship	Faculty of Engineering and Science	Process + cognition world
4	Data Engineering	Entrepreneurship	Faculty of Engineering and Science	Process + cognition world
5	Entrepreneurial Engineering	Entrepreneurial Practice, Corporate Entrepreneurship, etc.	Faculty of Engineering and Science	all the 4 worlds
6	Embedded Software Systems	Entrepreneurship	Faculty of Engineering and Science	Process + cognition world
7	Innovation Management	Innovation Systems and Entrepreneurship	Faculty of Social Sciences	all the 4 worlds
8	Innovation and Entrepreneurship	Executing Entrepreneurial Ideas	Faculty of Social Sciences	all the 4 worlds
9	Informatics	Entrepreneurship	Faculty of Engineering and Science	Process + cognition world
10	InnovativeCommunicationTechnologiesandEntrepreneurship	Entrepreneurship, Innovation and Business Models	Faculty of Engineering and Science	Process + cognition world

11	Lighting Design	Creative Innovation and	Faculty of Engineering	Process +
		Entrepreneurship	and Science	cognition
		(elective)		world
12	Machine Intelligence	Entrepreneurship	Faculty of Engineering	Process +
			and Science	cognition
				world
		~		
13	Medialogy	Creative Innovation and	Faculty of Engineering	Process +
		Entrepreneurship	and Science	cognition
		(elective)		world
14	Software Engineering	Entrepreneurship	Faculty of Engineering	Process +
			and Science	cognition
				world
15	Information Technology	Entrepreneurship	Faculty of Engineering	Process +
	(Software Development)		and Science	cognition
				world
16	Vision, Graphics and	Creative Innovation and	Faculty of Engineering	Process +
	Interactive Systems	Entrepreneurship	and Science	cognition
		(elective)		world

## Annex 2: Operationalization of the interview guide

## PREAMBLE

"Diversity and impact of entrepreneurship education. A qualitative study on Aalborg University" is the name of the 10th semester project developed within the M.Sc Programme *Innovation, Knowledge and Entrepreneurial Dynamics* at Aalborg University.

The purpose of this study is to reveal the diversity of approaches to entrepreneurship education at Aalborg University as well as its impact students' behavior and career trajectory.

In order to collect data, a series of interviews need to be conducted. An informed consent form is going to be provided for you to sign. This form will indicate that all the information about this study was presented to you and that you agree to participate in the study. For a better assessment of the information provided by you, this interview has to be recorded. You also agree to this by signing the consent form.

#### INTERVIEW QUESTIONS (for the students)

1. Can you describe your current employment situation? Was it always like that?

2. What is your most recent academic degree?

3. In what year did you complete your education?

4. Can you please specify the general area of your qualification(s)?

5. To what extent are you familiar with the concept of entrepreneurship? Please describe.

6. Was there any entrepreneurship module/courses integrated in your education programme? Did you take it?

7. For what reasons did you choose to follow an entrepreneurship programme/module/course? Have your expectations been met? Please elaborate.

8. For what did this programme/module/course prepare you?

9. What was the course that you enjoyed most going to while you were a student? On what place, in terms of preference, would you put the entrepreneurship course you took? Why?

10. Which type of assignments were the easiest for you to complete while you were a student, the theoretical ones or the practical ones?

11. Have you ever heard about initiatives like WOFIE or Venture Cup? Did you or would you take part in such events? Please elaborate.

12. Have you ever had a business idea that you wanted to put into practice? Can you describe?

13. Have you ever tried to start up your own business? When did it happen? Is it still active? What went wrong?

14. What motivated you to start up a business? Would you try again?

15. Did taking the entrepreneurship programme/module/course help you in this sense? How?

16. What about your workplace, are you encouraged to take initiative and come up with new ideas for your work? If not, have you ever tried taking initiative? What happened?

17. What about your coworkers, do they take initiative? Why is that?

18. What about the previous workplaces you had, did they support entrepreneurial behavior?

19. Do you feel like your education has any utility in the entrepreneurial activities that you undertake (if you do)? Please explain.

20. After you finished your education, was it ever necessary to go to the library and do research on a certain topic in order to complete a task you were given? Why was that and how did it work out?

21. What about asking for information (advice) from a more experienced coworker? Did that ever happen?

22. Which one out of the two situations above had better results? Can you please explain?

23. To make it more concrete, let us say you are in charge of a project and you spot a better opportunity for it. Your superior does not necessarily agree with you and the only way to persuade him is by promising a great success.

23. a. Do you take initiative towards that new opportunity or you stick to the initial plan? Why?

23. b. Given that you decide to take that opportunity, you notice you need to do some more research in order to be able to take it. Do you try to do it by the book or do you ask for the advice of someone who has more experience? Please elaborate. (theoretical knowledge vs practical knowledge)

23. c. Somewhere along the way you realize that your new goal is actually impossible to achieve. What do you do? Do you go back to what you were initially supposed to do, you try to find something else, better than both options you had or what else? Explain.

24. What would you say, in general, about yourself: do you act entrepreneurial in your daily activities? How? Does that come naturally to you or you learned it from somewhere or someone?

25. Would you say that the entrepreneurship programme/course you took had any kind of influence over who and where you are today? Would you make any changes to the course/programme? Why?

## INTERVIEW QUESTIONS (for the professors)

1. What is the name of the course/programme you are coordinating?

2. What exactly are the tasks you undertake in the position you occupy?

3. I read the description of the course, so I know the general facts about it but what can you say differently about what you are teaching?

4. How do you conduct your course? What activities are part of you day-to-day classes? Are there some special things you do in order to motivate your students?

5. How would you best describe entrepreneurship education? How do you think entrepreneurship should be taught?

6. Do you think there is any connection between problem-based learning and entrepreneurship education?

7. What do you want your students to take away with them from your course?

## CLOSING SECTION

Are there any responses you would like to elaborate upon or questions that you would like to ask me about the things we discussed in this interview?

Thank you very much for your time.

### **INFORMED CONSENT**

["Diversity and impact of entrepreneurship education. A qualitative study on Aalborg University"]

## **Project Description**:

This project is developed within the MSc Programme "Innovation, Knowledge and Entrepreneurial Dynamics" at Aalborg University.

The purpose of this study is to reveal the diversity of approaches to entrepreneurship education at Aalborg University as well as its impact on students' behavior and career trajectory.

In order to collect data, a series of interviews need to be conducted. By accepting the conditions stated below and signing the forms, you are giving your consent to participate in this study and to become one of the interviewees.

## **Procedure and Risks:**

With your agreement, the interview will be recorded and the tapes will be used to produce written materials. The recording will only take place after your written consent will be received. To ensure your anonymity no personal identifiers will be used during the interview. Please feel free to say as much or as little as you want. You can decide not to answer any question, or to stop the interview any time you want.

If you so choose so, the recordings and recording-transcripts (or copy of notes taken) will be kept anonymous, without any reference to your identity which will be concealed in any reports written from the interviews.

There are no known risks associated with participation in the study.

## **Confidentiality:**

All information collected during the study period will be kept strictly confidential until such time as you sign a release waiver. No publications or reports from this project will include identifying information on any participant without your signed permission, and after your review of the materials. If you agree to join this study, please sign your name on the following page.

## INFORMED CONSENT FOR INTERVIEWS

["Diversity and impact of entrepreneurship education. A qualitative study on Aalborg University"]

I, \_\_\_\_\_, agree to be interviewed for the project entitled \_\_\_\_\_\_ which is being produced by Maria-Stefania Nacuta, master student at Aalborg University.

I certify that I have been told of the confidentiality of information collected for this project and the anonymity of my participation; that I have been given satisfactory answers to my inquiries concerning project procedures and other matters; and that I have been advised that I am free to withdraw my consent and to discontinue participation in the project or activity at any time without prejudice.

I agree to participate in one or more <u>electronically recorded</u> interviews for this project. I understand that such interviews and related materials will be kept completely anonymous, and that the results of this study may be published in an academic journal or book.

I agree that any information obtained from this research may be used in any way thought best for this study.

Signature of Interviewee Date

If you cannot obtain satisfactory answers to your questions or if you have comments or complaints about your treatment in this study, contact:

MIKE-E and MIKE-B Coordinator:

Bram Timmermans Fibigerstræde 11 (Room: 138) DK-9220 Aalborg Øst Phone: +45 99 40 82 36 bram@business.aau.dk

### FINAL CONSENT FORM

["Diversity and impact of entrepreneurship education. A qualitative study on Aalborg University"]

## Dear Participant:

This form gives the final authorization to use material from your interview in "Diversity and impact of entrepreneurship education. A qualitative study on Aalborg University". A draft of these materials should have been presented to you for your review, correction, or modification. You may grant use rights for this draft "as is", or with the modifications you specify, if any. See "Conditions" at the bottom of the form

I, \_\_\_\_\_\_, hereby grant the right to use information from recordings and/or notes taken during the interview, to Maria-Stefania Nacuta, and as presented to me as a draft copy. I understand that the interview records will be kept by the interviewer, and that the information contained in the interviews may be used in materials to be made available to the general public.

\_\_\_\_\_ By signing here, I also agree to be i<u>dentified by name</u> in the project and related materials.

Signature of Interviewee

Signature of Interviewer

Date

Date

The following conditions limit the release of information, as agreed between the interviewer and the interviewee:

\_\_\_\_ None needed

\_\_\_\_\_ Material may be released once corrections I specified have been made

\_\_\_\_\_ Material may be released once it has been edited by a third part (please specify)