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COGNITIVE MODEL OF ENTREPRENEURSHIP AND ITS REFLECTION IN EDUCATION

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ABSTRACT

This paper employs a novel method for assessing the appropriateness of different types of entrepreneurial education. With the help of cognitive mapping as a research tool, it visualizes entrepreneurship as a skill-and-attitude-demanding activity and compares a generated model of required entrepreneurship capabilities derived from cognitive mapping of engaged entrepreneurs, with mapping of three Scandinavian graduate programmes in entrepreneurship; at BI Norwegian School of Management, University of Oslo and Lund University. The cognitive maps are discussed and compared, focusing on elements that are under- or over-represented in the programmes when compared to our model. Based on our findings, a number of recommendations to people involved in creating and managing entrepreneurship programs are proposed: More attention to selection of students with appropriate attitudes, increased attention to certain under-represented topics (employee management, social networks, marketing and sales skills), more application of experiential and networking approaches, and increased focus on self-learning.

Entrepreneurship educational programmes have over the last couple of decades become widespread at universities and business schools around the world. This, of course, raises the question whether or not entrepreneurship in fact is something you can actually learn at schools – or the degree to which we may expect such learning to be productive. “If you want to teach people to be entrepreneurs, you can’t. If you want to teach people to work for entrepreneurs you could […] I believe that most people are not well suited to be entrepreneurs” (Aronsson 2004: 289; 291). These quotes stem from an interview with David Birch, a well-known American researcher in community development and entrepreneurship from MIT. They represent certain doubts in the legitimacy of entrepreneurship education.

This article is based on a study of entrepreneurship education that is built on the assumption that entrepreneurship education may actually be productive in preparing and training people adequately for this kind of “profession”. To assess both the content and the methods of such programmes, we have established a model of effective entrepreneurship by extracting insights from practising entrepreneurs by the use of cognitive mapping techniques, and by comparing these findings with the literature. Hence, the objective of this research is to investigate the correspondence between entrepreneurship as seen by practitioners and entrepreneurship as educational practice; to identify deviances and hopefully to offer some advice to educational practice from the perspective of the entrepreneurs themselves.

It should of course be recognised, that both researchers and educators engaging in entrepreneurship education may have gathered insights about adequate entrepreneurship education that may not be represented by practising entrepreneurs. This might very well be the case. However, as a point of

departure, we assume that education of professionals, should aim at integrating and conveying the collective experiences and insights of the professional practice itself – pointing at the adequacy of the focus of this study.

The amount of literature on entrepreneurship education has proliferated in recent years. However, there is not much research comparing the understanding of entrepreneurship by practitioners on the one hand, and the understanding represented by study courses on the other. Hence a major proposition of this paper is the following: In order to assess the quality of entrepreneurship education, we need to thoroughly understand this phenomenon through the eyes of entrepreneurs.

1. STUDIES OF ENTREPRENEURSHIP EDUCATION

Drucker (1985), Kruegel and Brazeal (1994), Gorman et al. (1997) and Kuratko (2005) argue that entrepreneurship can be learned, or, if not learned, at least developed through entrepreneurship education. A study by Hill et al. (2003) states that 72% of MBA graduates they surveyed in the USA and the Northern Ireland, had developed new entrepreneurial skills through completing an entrepreneurial programme. Rasmussen and Sørheim (2006) show in their case study analysis of five Swedish programmes that teaching entrepreneurship can be considered very successful. They substantiate their claims with such measures as the number of companies started by the participants of these programmes and the number of commercialized inventions at these universities.

The ability of people to gain certain entrepreneurial skills through education is vastly postulated as a valid notion, and the researchers, instead, overwhelmingly focus on the methods of delivery as well as the quality of current education practices. For instance, Man (2006) discusses the following approaches to entrepreneurial learning: experiential, cognitive/affective, networking, and competency. Jamieson (1984) suggests that entrepreneurship education can be categorized into ‘About’ and ‘For’ enterprise approaches. The ‘About’ enterprise approach focuses on providing theories and perspectives on entrepreneurship as a phenomenon. The ‘For’ enterprise approach focuses on providing actual preparation for set-up and running of the business.

Although researchers and practising educators argue about the virtues of different approaches to entrepreneurship education, there is one common principle that everyone seems to widely agree upon: The best way to learn entrepreneurship is to 'live' it; nascent entrepreneurs learn best by actually doing things. Davies and Gibb (1991) argue that the traditional theory based approach is inappropriate for teaching entrepreneurship - instead one needs to provide experience and practical skills. Ulrich (2009) finds in his research that the entrepreneurial-minded students (that is, the most potent entrepreneurial leaders) support more active, non-traditional instructional strategies. Different studies discuss various teaching techniques: The project-based approach (Okudan and Rzasa 2006), practical field projects (Bell et al 2004), business plan competitions (Russell, Atchison and Brooks 2008), a student organisation's business projects (Plumly et al. 2008), micro field-based student consulting (Heriot et al. 2008), and involvement of external mentors (Barbosa, Kickul and Smith 2008).

Another aspect mentioned by several analysts is that this education ought to be individual-centred. One example is the problem-based learning in which teachers primarily act as facilitators in classes (Hanke, Kisenwether and Warren 2005, 1-2). Jones (2006) describes the development of a student-centred enterprise programme with elements such as workshop game, creation of entrepreneurial story and reflection journal. Kirby (2007) argues that the "place" of learning should be moved from a classroom to incubators.

The importance of continuous learning has been exemplified in the study of Man (2006) who found that one of the most important prerequisites for entrepreneurial success is the ability to learn, and concludes that the emphasis of education should be on modification of (potential/nascent) entrepreneurs' learning patterns.

Other authors bring out what skills and attitudes nascent entrepreneurs could (and should) learn through professional educational programs. Hisrich and Peters (1998:20) categorize applicable entrepreneurial skills as following: Technical skills (written and oral communication, technical

management and organizing skills), business management skills (planning, decision making, marketing and accounting skills), and personal entrepreneurial skills (inner control, innovation and risk taking). Fayolle (2008) distinguishes between the professional dimension (know-what, know-how and know-who), the spiritual dimension (now-why and know-when), and the theoretical dimension (theories and scientific knowledge that are useful to understand the entrepreneurial phenomenon). Barbosa, Kickul and Smith (2008) speak of two dominant modes of cognition – analytical and experiential – and argue that both of them are required at different stages of the entrepreneurial process and need to be addressed through the education.

Other researchers analyse existing programs, looking at what themes and subjects are covered. David Birch, an entrepreneurship researcher interviewed by Aronsson (2004), claims that selling-skills are of utmost importance to any entrepreneur. Yet there is no subject called 'Sales' in any business school he knows of in the US. Birch also points out that topics such as managing people and creating a new product or service are weakly represented in business schools' curriculum. Kuratko (2005), on the other hand, argues that although taking moderate risks is one of the primary characteristics of entrepreneurs, it is rare to find "risk" as part of any curriculum of entrepreneurial education. Edelman, Manolova and Brusha (2008) found in their study of entrepreneurs that setting up supply chain operations was important to entrepreneurs but was not emphasized in the textbooks. However, business planning is often over-emphasized in school textbooks whilst entrepreneurs do not consider this skill equally important.

Other studies of entrepreneurship education focus on comparison between courses provided by different universities, (Garavan and Ó Cinnéide (1994), Hill and Leitch (2003), Rasmussen and Sørheim (2006)).

Nevertheless, there are only a handful of studies related to the comparison between the skills addressed by entrepreneurship courses and the skills seen as the most relevant by practising entrepreneurs (see figure 1 below). As one example, Edelman, Manolova and Brusha (2008) found

a sizeable discrepancy between the activities typically presented in the entrepreneurship textbooks and the activities practised by nascent entrepreneurs.

[Figure 1 about here]

2. COGNITIVE MAPPING AND DATA COLLECTION

We employ elements of phenomenological and grounded theory approaches to our qualitative inquiry. We aim not only to describe the essence of the phenomenon, but also attempt to create a suitable model that helps to extrapolate this knowledge into the realm of education (Creswell 2007).

In order to depict such a model of entrepreneurship, we apply the method of cognitive mapping. In essence, this research method is used to visualize the conceptual entities or 'personal models' of certain decision makers (Edkins et al. 2007). Ambrosini and Bowman (2002) write that there are several ways of constructing a cognitive map – from written texts, structured and semi-structured interviews and through storytelling. Several scholars have used this tool to construct so-called group-maps or collective cognitive maps, which can be seen as an average of individual maps or as a composite of individual maps.

2.1. Cognitive mapping in entrepreneurship research

When cognitive mapping was introduced in business studies, it was first applied in research on managerial cognition in studies that reflected a phenomenological perspective and started out with detailed case studies and grounded theory approaches. For example, Calori, Johnson and Sarnin (1994) explored the cognitive maps of CEOs in complex managerial situations. Jenkins and Johnson (1997) pioneered the application of cognitive mapping in studies of entrepreneurs. They considered the contrast between entrepreneurial intentions and outcomes. Pitt (1998), on the other hand, combined cognitive mapping as a tool with the case study methodology and depicted a detailed script of the two entrepreneurs' personal stories. Russel (1999) used the cognitive mapping approach to build a model of corporate entrepreneurship from an organisational perspective.

Porac, Mishina and Pollock (2002) did a study on the perceptions and beliefs of entrepreneurs that possibly affected continued growth of their firms. The authors used narratives written by the entrepreneurs aimed at achieving nomination for awards as outstanding business leaders in the USA. As a result, the authors developed five clusters of dominant entrepreneurial thinking which represented certain shared attitudes. However, we have not found any studies using the cognitive mapping method in research particularly on entrepreneurship education issues.

2.2. Details and constraints of cognitive mapping

The cognitive map (or a cause map, as a more specific type of it) is depicted as a directed graph, which consists of nodes (terms) and arrows linking them. The nodes stand for concepts which entrepreneurs - in our case - subjectively seem to perceive of within the domain we have focussed. The arrows represent their beliefs about (causal) relationships between the concepts/phenomena. A configuration of such interlinked concepts and beliefs can thus model the patterns of causal thinking of a person or a group (Axelrod 1976; Eden 1992; Huff and Jenkins 2002).

There are certain lessons to bear from previous research having used cognitive mapping too. For example, Ambrosini and Bowman (2002) note that it is good to have coding of the same texts performed by more than one researcher in order to minimize subjectivity. Johnson and Johnson (2002: 232) argue that the scholars using this tool should not become too 'carried away' about extrapolating the results of their studies; "maps […] are not models of cognition but approximated displays of elements of managers' thoughts at a specific point in time, noted in particular ways in particular environments that determine their format and in many instances their content".

2.3. Sampling and collecting data

When deciding for the strategy of sampling, we found the discussion by Creswell (2007: 118) useful, who argues for the purposeful (theoretical) sampling of individuals. When one employs the grounded theory / phenomenological approach to the study; "it is not a probability sample that will enable a researcher to determine statistical inferences to a population; rather, it is a purposeful

sample that will intentionally sample a group of people that can best inform the researcher about the research problem under examination." Creswell writes that within the grounded theory approach the individuals belonging to the sample may not be located at a single site. Moreover, if they are dispersed, they can provide important contextual information useful in developing categories during the coding stage of the research. Thus, we used a purposeful sample in our study. In order to tackle the entrepreneurship phenomenon as holistically as possible and to increase the degree of generalization of the study, we needed to cover various types of entrepreneurs with respect to age, gender, countries, industries, size of business, etc.

We collected our data from three sources: 1) entrepreneurs interviewed by us, 2) entrepreneurs' diaries, and 3) study programmes. Note that the sample of entrepreneurs contains two parts: The first (our own interviews) goes in-depth, while the second contains analysis of written diaries from BusinessWeek, which takes a larger number of cases into consideration. The purpose of having two major sources of data for the same phenomenon is to improve the reliability of the overall study.

1) Entrepreneurs interviewed by us: We have chosen nine entrepreneurs who were known by us or have been recommended by our acquaintances. Not only were the selected entrepreneurs interviewed by us at their offices, but also shorter interviews were done with questions sent by email to some of their key employees, business partners and/or clients in order to validate the entrepreneurs' stories. All the interviews took place from November 2009 till March 2010. For the purpose of subsequent coding and analysis, interviewees were anonymously labelled as 'EN01', 'EN02', 'EN03', according to their last names' - in alphabetical order. For more comprehensive information on the sample of entrepreneurs, see table 1 below.

[Table 1 about here]

2) Entrepreneurs' stories from BusinessWeek (online edition called Bloomberg BusinessWeek): BusinessWeek is a well-known quality media channel that we believe can act as a reliable filter for the information presented in the form of entrepreneurs' stories. We analysed 27 stories published in

the series called “Entrepreneur's Journals” (http://www.businessweek.com/smallbiz/journals). The stories are based on self-reported articles (diaries) of different small- and middle-size business owners. We included in the sample all stories published between 20.06.2007 and 23.02.2010. For the purpose of subsequent coding and analysis, all stories were labelled ‘BW01’, ‘BW02’, ‘BW03’... according to the entrepreneurs' last names’ – in alphabetical order. See table 2 for more comprehensive information on the analysed entrepreneurs’ diaries.

[Table 2 about here]

3) Study programmes: In order to analyse representations of programmes as well as cognitive models of entrepreneurship teaching activities in higher education, we limited ourselves to three graduate programmes in Norway and Sweden. These are the master-programmes in innovation and entrepreneurship at BI Norwegian School of Management (Norway) and as University of Oslo (Norway) and the master-programme in entrepreneurship at Lund University (Sweden). We interviewed the programmes' administrators and analysed both the content of the interviews as well as the descriptions of the courses available on the websites of the universities. The interviews took place in May 2010. See table 3 for detailed information on the programmes analysed.

[Table 3 about here]

2.4. Coding

After the data were collected, the grounded theory approach envisaged elaborate coding procedures. Collected data were content analysed and broken down into component parts which were given names (Bryman and Bell 2007). In our study, we used the software programme Nvivo to store, categorise and code the data.

The first step was to code the text in terms of relevant analytical concepts ('nodes' as they are called in Nvivo) related to entrepreneurship as a phenomenon. As the grounded theory suggests, we were establishing codes during the process of coding – creating, merging, and removing them whenever

necessary. We grouped units of text that have similar meaning under the same codes. These units may have been words, phrases, sentences or other lexical units that we deemed appropriate. The language of the participants guided the development and naming of code and category labels.

In line with the advice by Axelrod (1976), we established the concepts in such a way that it would later allow us to construct proper mental maps – a simple rule of measuring the validity of the concept by adding ‘more’ or ‘less’ to it and verifying if it made sense from the perspective of the study subjects. For example, if a subject talked about the importance of recruiting good people in a team, we would not call the category ‘Recruitment’. Instead, we called this particular concept ‘Right recruitment’. More of the 'Right recruitment' should logically lead to higher utility.

Next, we will present one example of concept construction. Here are the quotes from three different sources: (1) “We had not yet fully committed to the process, and it showed. That was lesson No. 3: Commit fully or not at all” (BW18); (2) “You always need to focus concept, focus the area of success.”(EN02); (3)” ...if I am to generalise, is focusing on topics related to a strategy.”(EN05). All these quotes relate to commitment to core business. Thus, we grouped them under the concept ‘Business focus’.

We used the same software programme to help us compare the independent coding results from the same transcript/story. To achieve this, we read through several transcripts and coded each transcript independently. After coding the transcripts, we met, examined and agreed on the codes, their names, and the text segments as they had become coded.

When we categorized of data, we tried to make each node mutually exclusive, and write down descriptions and examples to avoid confusion. We also decided to allow multiple codes for the same unit of text (e.g. a sentence from EN02 “I measure success... first of all, by the ability to make something that is profitable and sound business...” entails both coding as ‘Maximizing profit’ as well as ‘Sustainable company’).

According to Eden, Ackermann and Cropper (1992), mapping is most effective when the researcher has a way of sorting the concepts into certain hierarchical categories. The layers they suggested are called ‘Goals’ (at the top), ‘Strategic directions’ and then ‘Potential options’. Following these guidelines, we categorized and visualised the nodes as follows:

- ‘Outcomes and goals’: These are the goals of the entrepreneurs, the utility or objectives they perceive of from being engaged in it (for example, maximizing profit).

- ‘Strategic directions’: These are directions that have strategic implications and are supported by certain actions (for example, growing or scaling the business).

- ‘Potential options’: Actions that may lead to ‘Strategic directions’ or directly to ‘Outcomes and goals’ (for example, effective marketing).

The second step in the coding procedure involved identifying the ontological relationships between the concepts/nodes. In our study, we looked for two types of relationships. First, associative (attributive) relationship, whereby a concept is a property of or is closely related to another concept. Second, we assessed the cause-effect relationships. To illustrate these, we will describe in detail two examples of such relationships:

[Figure 2 about here]

By obtaining information from external experts, the entrepreneurs can have a better understanding of the legal environment in order for instance to better structure their business operations. Next, a structured business approach provides better opportunities for conducting professional market research. When acknowledging the market's needs, the entrepreneurs can more effectively adjust their marketing strategies which, in turn, may lead to the fulfilment of entrepreneurial goals.

[Figure 3 about here]

‘Pursuing opportunities’ is one of the most important defining features of entrepreneurship. However, we also discovered that entrepreneurs do not speak about what might be interpreted as reckless opportunistic behaviour. Rather, they mean calculated, substantiated decisions to pursue new opportunities that they have somehow discovered. On the one hand, one needs to be aware of the legal environment. On the other hand, in order to be able to grab an opportunity, most entrepreneurs need to focus a lot of attention on securing funding for their project.

As was the case with the concepts themselves, we first coded relationships described in the same texts separately, and then came together to compare and discuss the results of the individual coding.

2.5. Cognitive mapping

Axelrod (1976: 62) depicts some conventions for drawing the map:

- whenever possible, the map should be drawn so that the arrows flow from left to right;
- the points should be arranged so that there is little or no crossing of arrows over each other;
- if there are variables that represent choices to the person or organisation, these variables should be displayed on the left side of the cognitive map, and
- if there is a variable representing the person's-, or the organisation's overall goals, it should be displayed on the right hand side of the cognitive map.

Eden, Ackermann and Cropper (1992) describe additional properties of mental maps:

- It should be easy to distinguish “core constructs” - to highlight them visually.
- Maps should be simplified through reductionist analysis (e.g. A > B > C can be reduced to A > C; nodes with a single link to other parts of the map can be deleted).

According to these conventions, we generated a collective (composite) cognitive map of entrepreneurship skills and attitudes, as several researchers suggest (e.g. Carley 1997). However,

we discovered that having all nodes at one map does not result in a sensible model – there is simply too much visual information there. Thus, we decided to strip the maps for less significant nodes. A number of issues arise when such an approach is taken. The primary one is: What needs to be included or excluded? Carley (1997) suggests that in order to construct collective mental models, researchers can include only those concepts and relationships that are shared by at least 'x' team members that are part of the collective map ('x' is set as some cut-off value). Thus, as Carley (1997) suggested, we set an arbitrary measure to exclude nodes which have been present in less than seven sources (the concepts presumably being important to less than seven entrepreneurs).

Some of the scholars using the method of cognitive mapping visualise the frequency of certain codes by making the nodes mentioned larger than the others (e.g. Jasinski and Huff 2002). Likewise, after the aggregated map was automatically generated by Nvivo, we adjusted the size of nodes so that it would roughly correspond to the frequency of their mentioning by the sources.

According to the conventions for drawing a map, we depicted all causal relationships to go from left to right and tried to avoid links between nodes crossing over each other. Causal relationships are marked with arrows while associative relationships with simple connectors. Relationships in the aggregated maps are derived from the relationships within mental maps of individual constituencies of these models. In the end, we got the first version of the collective mental map.

Several authors who have applied cognitive mapping in their studies suggest constructing clusters of categories/nodes (e.g. Porac, Mishina and Pollock 2002 and Edkins et al. 2007). Thus, we constructed several clusters with different numbers of nodes within each of them for better visibility. For example, the original nodes ‘Creativity’, ‘Good business idea’, ‘Ignoring industry practice’, ‘Matching clients with product’, ‘New product development’ and ‘Using different perspective’ were clustered under ‘Innovation’. All clusters with their respective nodes categorised into them, can be seen in table 4 below.

[Table 4 about here]

To differentiate across the relative prominences of different clusters, we adjusted their visual sizes according to the number of nodes they contain. In other words, the bigger the cluster image, the more nodes it contains. We did not differentiate between the frequencies of occurrence of different nodes like we did in the first version of the map. The relationships between the clusters were derived from the relationships of individual elements of the clusters.

The same process was repeated for the university programmes' individual mental maps. First, we constructed initial mental maps, and then clustered mental maps. In the second step, we took into account the more substantial prominence of the concepts with the separate courses devoted to them – by somewhat increasing the visual size of the clusters that were focused upon in the curricula.

When presenting findings of this paper, we focus on the clustered mental maps, as they are more concise and accordingly easier to compare than the many individual maps.

2.6. Limitations of our research design

A first limitation of this study is that our sample has limited scope for generalisation. It is a non-probability sample. It includes more male entrepreneurs; more small- to medium business owners and excludes certain industries and regions. On the other hand, the proportion of male and SME business owners is higher in reality too, while the specificity of certain industries and regions might not be very significant. Lastly, our sample of university programmes is by purpose limited to Scandinavian master programmes only.

Second, we mostly rely on self-reported data (interviews, published diaries of entrepreneurs, curriculum descriptions), only partly verified by related people in the interviewed entrepreneur cases. This creates an inherent bias in terms of subjects willing to say what they feel they are expected to say or what they think is politically more beneficial to say (Axelrod 1976; Laukkanen 1994). On the other hand, the benefit of using indirect data is better accessibility – important for our intention to generalize more broadly.

Third, regarding the study programmes we analysed intentions of curricula, and not the actual delivery or outputs. We did not interview the students to obtain their assessments of the programmes. However, that kind of approach would have required much more effort and time, which was out of scope for this study.

Fourth, we have personally been connected to one of the study programmes that we analysed. However, we restrained from bringing our own experiences into the coding and analysis and strictly relied on the accounts provided to us by the universities' programme managers and the official descriptions of the programmes.

Fifth, on a more general note, the major criticism against the grounded theory and phenomenological approach (as well as the methodology of cognitive mapping) is related to selectivity of our data (Jasinski and Huff 2002; Bryman and Bell 2007). Although we attempted to establish objective criteria for selecting/removing certain data in our final findings, in many instances we had to disregard some data based on the perceived lack of usefulness for the research objective (thus, on our own perception of its usefulness).

Sixth, as may be observed in the description of the process of mental mapping, we came up with several arbitrary conventions to reduce the data on the map and to make it more enlightening and useful. However, this process is no different from using certain arbitrary conventions by cartographers when creating geographical maps (Huff and Jenkins 2002).

2.7. Reliability and validity of the study

To increase reliability of our study, we have extensively used the inter-coder agreement process. As mentioned above in our coding process, we coded the whole content separately, while meeting and discussing through the bulk of texts coded after several ‘rounds’ of independent coding.

To validate our research, we employed methodological triangulation: We used different methodological procedures to measure the same phenomenon in order to cancel out the limitations

of one method by the use of another. On the one hand, we did interviews with entrepreneurs from different countries, while on the other, we analysed the diaries of (mostly) American entrepreneurs. Second, we employed triangulation by data source; using different sources of the same data to confirm our findings – both in case of interviewed entrepreneurs (supported by shorter interviews with people related to them) as well as in case of the study programmes (we did interviews with the curricula managers and analysed the content of the programmes' description).

In addition we tried to adhere to the principle of rich, thick description to convey the findings (Geertz 1973). We have also attempted to describe our procedures, doubts and methodological questions in a detailed and transparent matter.

3. COGNITIVE MAPPING OF ENTREPRENEURIAL EXPERIENCES AND ATTITUDES

According to the conventions outlined in previous section, we constructed the initial mental map of each entrepreneur's experiences and opinions. The nodes represent what they perceive of as the most important concepts of entrepreneurship. Nodes representing 'Potential options' are marked with capital 'P', whereas 'Strategic directions' and 'Outcomes and goals' are marked with 'S' and 'O' respectively. The visual size of the nodes corresponds to the frequency of them being mentioned across the analysed cases (see figure 4).

[Figure 4 about here]

After constructing an initial unified map based on the mental maps of entrepreneurship, we grouped all coded categories together into clusters of meaning. Next, we re-generated the clustered map based on these clusters. We will now present some highlights of this map. See figure 5 below for the more complete clustered mental map.

[Figure 5 about here]

3.1. Potential options in clustered map of entrepreneurship

‘Personal attitudes’ is clearly the most dominant cluster. This is not a surprising result taking into account the large amount of distinct personal skills and attitudes that were mentioned by entrepreneurs on multiple occasions, such as ‘Hard work’ or 'Self-confidence’. One example of such attitudes is ‘Persistence and strong will’. The entrepreneurs speak of it as “not giving up despite whatever difficulty”, preserving belief in their venture: “I went to the first bank; they turned me down flat. Then another and another” (BW07).

The second most prominent cluster is ‘Strategy and planning’. Entrepreneurs need a good structure around their business. This is reflected in concepts such as ‘First-mover advantage’, ‘Strategic fit’ and ‘Proper planning’. An example of the latter is the following quote: “If I did not have a clear future planning, I believe that many of my staff would have left me” (EN08).

The third most outstanding cluster in entrepreneurial thinking is what we have labelled ‘Risk-taking’. It encompasses the whole chain of core entrepreneurial activities; from scanning opportunities to taking the risk of seizing them, such as ‘Exploiting opportunities’, ‘Taking calculated risks’ and ‘Readiness for uncertainty’. The following is an example of the concept of ‘Exploiting opportunities’: “The silver lining is that the scepticism of others creates my first-mover advantage to seize fringe opportunities they can't yet see” (BW01).

Other prominent clusters of potential options are: ‘Employee management’ exemplified by such concepts as 'Adequate leadership', 'Proper team management' and 'Right recruitment'. One entrepreneur wrote - referring to the right recruitment - that “...the idea is just the starting point, just the first step. You also have to find the right people to help you do it. No successful company has ever been the product of just one person” (BW04).

‘Human networks’ encompasses for example 'Right partners' or ‘Getting external expertise’. The latter implies that entrepreneurs often need to recognize their own limitations and be willing to

work with consultants, external partners and personal mentors: “You need a coach; you need somebody that runs through your business plan” (EN02).

‘Learning and training’ refer to the awareness of various areas (e.g. 'Awareness of legal environment') and to continuous learning. Several entrepreneurs emphasized that ‘Learning by doing’ was critical to entrepreneurial success: “From day one, no entrepreneurs know that they were entrepreneurs. 100% of entrepreneurs pay a ‘fee’ to learn. Everybody learn from the hard way” (EN08).

‘Innovation’ is exemplified by concepts such as 'Creativity', 'Matching clients with product' and 'New product development'. Here is a quote from one of the entrepreneurs referring to new product development: “During the last year as well, we have created many products, based on the needs of a concrete client... and we see that they can be replicated very well. This year has been a year of a powerful development, since we heard the need of a client during the crisis” (EN06).

‘Marketing’ is referring to such concepts as 'Finding new clients' or 'Effective marketing'. No less important is the need for proper 'Market intelligence': “You need to know the market trend and direction […] talk and interact more with the people in the market. Then, you will know what will happen in the market” (EN01).

3.2. Relevant strategic directions in clustered mental map

Among the strategic antecedents of entrepreneurial success, we have indentified three groups of stakeholders. The first consists of the external partners represented by the node ‘Sound business relations’ in the map. Such relations are underlined, among others, by reference to ‘Having trust with stakeholders’: “You need your business partners to be able to trust you. When you say something, you need to take responsibility” (EN03).

The second stakeholder group is the ‘Loyal clients’ which, for example, relates to the concept ‘Mutual understanding with clients’. An example was given to us by one customer who we

interviewed as part of constructing the case for one entrepreneur: "…a very strong client-orientation, meaning, that she relates herself as much to the client's objectives as to her own. And, based on that, certainly, the work of the team is being built up which is dealing with realization of the objectives" (EN06's client).

And lastly, the third stakeholder group is the 'Motivated employees': "This helps me treat my co-workers even better, which in turn makes them more productive and happier about where they are" (BW12). In addition, to successfully grow a company, one needs to achieve 'Economies of scale'.

3.3. Outcomes and goals of entrepreneurs in clustered mental map

In terms of business outcomes, there are two primary groups of entrepreneurial goals. First, entrepreneurs typically aim for 'Creating value', exemplified by the concepts 'Value for society', 'Value for clients', 'Opportunities for employees' and 'Realizing vision'. An example of the latter is the following: "I had big dreams; you can't be an entrepreneur without them. I wanted to make a big company—whatever that meant—and I was willing to work hard to do it" (BW13). Second, in line with the classical definition of business owners' motivation, entrepreneurs aim at achieving 'Financial strength'. This includes the notions 'Maximizing profit', 'Selling more products' and 'Sustainable company'. One entrepreneur told us the importance of selling more products: "What is successful? In Mainland China, there are 2 billion old cards. I have only upgraded 10 million new cards. So, it has not reached my target. My mission is to dump away all 2 billion old cards" (EN08). Another criterion for entrepreneurial success is: Achieving 'Market recognition' and performing a 'Successful exit'.

4. REFLECTIONS OF ENTREPRENEURIAL THINKING IN THREE STUDY PROGRAMMES

In this section we will depict cognitive maps of the Master programmes in innovation and entrepreneurship at BI Norwegian School of Management (BI) and University of Oslo (UiO) and the Master programme in entrepreneurship at Lund University (Lund). Our main aim here is not to compare different programmes with each other, but rather to compare them with the collective

representation of entrepreneurship as represented by our clustered mental map obtained from entrepreneurial practitioners.

4.1. The clustered mental map of BI Norwegian School of Management (BI) programme

For the purpose of better comparability, we only focus on the clustered mental maps of educational programmes. The depicted clustered map of the graduate programme in innovation and entrepreneurship at BI is presented in figure 6.

[Figure 6 about here]

From this model, we can see that 'Learning and training' is by far the most prominent concept in this educational programme. This means that the BI programme focuses on providing general theoretical knowledge to its students. Moreover, it has research methodology as a separate subject.

The second most prominent cluster is 'Innovation'. This is covered by several separate courses such as 'Managing innovation, design and creativity', 'New product development' and 'Theories of innovation'.

The other dominant clusters are 'Risk-taking' and 'Financial management' (there are two separate courses dedicated to financial management, one of them focusing on financing new ventures). The BI programme defines entrepreneurial success primarily in terms of achieving 'Financial strength', but coupled with 'Market recognition' and 'Creating value'.

4.2. The clustered mental map of University of Oslo (UiO) programme

The depicted clustered mental map of the graduate programme at UiO is presented in figure 7.

[Figure 7 about here]

Like BI, the clustered map of UiO indicates that this programme focuses on 'Learning and training'. There is a separate subject dedicated to the research design, as this programme is completed with a master thesis. In addition, there are both subjects presenting general theories of

the processes of innovation (like 'Innovation strategy and management') as well as courses aimed at having students go through learning by doing (like 'Practical innovation management' and 'Norwegian practical start-up experience').

Influencing ‘Personal attitudes’ of students, has a rather prominent presence in the cognitive map of the UiO programme. UiO conducts personal interviews during the students' application process in order to ensure that those joining the programme have the appropriate attitudes and capabilities to enter the programme.

A particular feature of this programme is that it is centred on the concept of ‘Technology management’. One of the entry requirements of the programme for the new students is that they have a natural science background. During the studies, students interact a lot with the related business sector, in particular with biotechnology firms in the Oslo Cancer Cluster and ICT firms. The ‘Employee management’ cluster is addressed through the course labelled 'Dynamic organising' where students work in a management team and have to complete certain practical assignments together.

‘Innovation’ has quite an important place in the programme. It is represented within several separate courses such as ‘From idea to business’, ‘Innovation strategies & management’, ‘Ideation and feasibility studies’ and ‘Practical innovation management’. Other prominent concepts are covered with separate subjects such as ‘Financial management’ and ‘Marketing’.

As for the outcomes, the programme at UiO primarily defines entrepreneurial success through achieving ‘Financial strength’. Due to the fact that the programme aims at educating business developers even more than entrepreneurs, ‘Being employed’ is treated as a success criteria outcome for its students.

4.3. The clustered mental map of Lund University programme

The depicted clustered mental map of the graduate programme in entrepreneurship at Lund is

presented in figure 8.

[Figure 8 about here]

The most prominent cluster is ‘Learning and training’. The programme focuses both on providing relevant theories as well as on training its students in how to acquire new knowledge.

‘Marketing’ is the next notable cluster of the entrepreneurial thinking at Lund. This is demonstrated by the fact that four separate but interrelated courses include elements of marketing: ‘Industry and competitor analysis’, ‘Customer analysis and market research’, ‘Writing a marketing plan’ and ‘Market exploitation and resource acquisition’. Furthermore, marketing is closely related to other clusters such as ‘Personal attitudes’,’ Strategy and planning’, ‘Innovation’ and ‘Financial strength’.

The programme tries to influence ‘Personal attitudes’ through experiential learning. One of the examples brought forward by its administrator is that confidence can be enhanced by experience. The faculty also conducts a survey of students’ personal attitudes before and after the programme. However, to ensure that students possess the right attitudes before the admission, Lund interviews students in order to check for their communication skills, previous start-up experience, business ideas and passion for entrepreneurship.

Lund’s students are given the chance to expose themselves to the ‘Human networks’ seen as necessary to developing and promoting their business. They work with researchers in other faculties and also interact with business people. Moreover, they can promote their business ideas to potential customers and investors at the end of the programme.

The other prominent cluster is ‘Risk-taking’. The administrator of the programme asserts that risk-taking is dependent on what kind of resources entrepreneurs have. The programme does not particularly encourage risk-taking but rather risk-moderating according to one’s resources. Therefore, it is closely related to the concept of resource management.

'Innovation' in the Lund programme is not its prime focus (as the title of the programme states). It is more concerned with creativity and recognizing the right business idea/opportunity, primarily covered in the course 'The entrepreneurial process and opportunity recognition'. 'Strategy and planning' in the Lund programme is centred around short-term, incremental and flexible strategies.

As for the entrepreneurial outcomes, the Lund programme focuses on achieving 'Financial strength', coupled with 'Creating value' and aiming for 'Successful exit'.

4.4. Comparison of all three programmes to entrepreneurship cognitive map model

For the ease of subsequent reading, see table 5 below which exhibits tentative comparison of the importance of different clusters in various mental maps that we analysed. Note that the arbitrarily set number of stars represents the relative significance of a cluster in a particular map.

[Table 5 about here]

As we found out by analysing the map of entrepreneurial cognitive thinking, the right personal attitudes is perceived of as the single most important prerequisite for entrepreneurial success. Yet personal attitudes do not have as prominent position in the mental maps of the university programmes. The administrators believe the curriculum cannot change the students' personalities. However, they admit that the processes of hard work and experiential learning as well as the teachers' guidance, can influence students' attitudes. In addition, the student-scanning process at the admission stage helps to ensure that accepted students have the appropriate entrepreneurial attitudes in the first place.

Not surprisingly, of all the concepts, all three programmes focus the most on learning and training. Students are presented with relatively general as well as highly subject-specific theories. They learn to conceptualise and create connections between various subjects. However, in relation to awareness of legal environment, all three programmes zoom solely on IPR rather than on other

presumably relevant aspects such as employment law, taxation system, accounting regulations, industrial practices and government policies.

One can observe relatively less emphasis on employee management in the maps of the university programmes compared to the clustered mental map of the entrepreneurs. Indeed, all programmes pay little attention to topics such as recruiting talents, managing team building, solving interpersonal conflicts, and similar capabilities.

Interestingly, entrepreneurs did not talk about the management of technology, while two of the analysed programmes paid quite a lot of attention to it (BI, but in particular UiO). However, that is most certainly related to the somewhat broader features of these programmes. Both of them are programmes in innovation and entrepreneurship, not simply entrepreneurship. Another reason could be that most of the entrepreneurs we interviewed or the articles we picked do not contain new technology-development based companies.

Regarding two specific topics – 'Financial management' and 'Marketing' – both of which have significant importance in entrepreneurial cognitive thinking, the university programmes seem to take different stands. UiO focuses on both of them. BI pays much more attention to financial management, while Lund concentrates on marketing. This may be due to different orientations within the involved research departments in these universities. In terms of marketing, no actual selling skills are taught in any of these programmes. This is similar to David Birch's critics of business schools' curriculums in USA (Aronsson 2004).

None of the three programmes does significantly cover any 'Strategic directions' (except for 'Economies of scale' in two of the three universities). However, in the entrepreneurs' mind, they are on the way to success if they can establish sound business relationships, build up loyal clients, motivate employees and live an entrepreneurial lifestyle. That might be an indication of university programmes not focusing on intermediate stages of venture creation and growth – instead, attention is primarily devoted to the start-up and the exit stages of the process.

Regarding entrepreneurial 'Outcomes and goals', the perceptions of educational program managers as well as the university curricula appear to be rather close to that of entrepreneurship practitioners.

5. DISCUSSION AND CONCLUSIONS

5.1. Consistencies with previous research on dominant entrepreneurial skills and attitudes

Our research broadly confirms findings by Timmons and Stevenson (1985) that the important skills and abilities of entrepreneurs are managing human resources and leadership, building an organisation and team-work, conceptualizing the business and doing strategic planning. These factors are represented by dominant clusters in our constructed entrepreneurship map such as 'Employee management', 'Strategy and planning' and 'Human networks'.

In general, our study is also consistent with the analysis of Hisrich and Peters (1998) who divided entrepreneurial skills necessary to succeed into three categories, (i) technical skills (included across several clusters in our paper); (ii) business management skills (represented by such clusters as 'Strategy and planning', 'Marketing' and 'Financial management'); and (iii) personal entrepreneurial skills (represented by such clusters as 'Personal attitudes' and 'Risk-taking').

In contrast with the results of Edelman, Manolova and Brusha (2008), the entrepreneurs did not speak much about supply chain management as an important skill. Moreover, there are mixed results regarding the relevance of business planning. Whereas Edelman, Manolova and Brusha concluded that this skill is relatively insignificant for entrepreneurs, we found that some stress the importance of the long-term planning, while others prefer the incremental short-term projecting instead.

5.2. Consistency with previous research on entrepreneurship education

The administrators of the three study programmes analysed unanimously agreed that personality traits cannot be changed through education, but certain attitudes can be influenced during the learning process. Such assertions match the overwhelming agreement in the literature that

entrepreneurs are at least partly ‘made’, not ‘born’ (for instance, Drucker (1985), Kruegel and Brazeal (1994), Gorman et al. (1997)).

Learning and training is the most prominent cluster in the mental maps of the study programmes in entrepreneurship. This result resonates well with findings of Man (2006) that one of the most important prerequisites to succeed for entrepreneurs is the ability to learn. The author concluded that the emphasis of the education should be on modification of (potential/nascent) entrepreneurs' learning patterns.

Based on our findings, risk-taking is one of the primary concerns for entrepreneurs. Risk can be studied in various dimensions such as financial risk, operating risk, market risk, credit risk or political risk. However, entrepreneurial risk is not present in the curricula as a stand-alone topic, and is only covered as part of subjects on finance. This result is in line with Kuratko (2005) who asserted that it is rare to find risk as part of any curriculum of entrepreneurial education.

One of the interesting findings is that all three analysed university programmes focus on setting up a new venture, without paying too much attention to subsequent strategic directions of the entrepreneurial process. Thus, as proposed by Gorman et al. (1997), educational institutions are mainly preoccupied with the early stages of an enterprise.

The three study programmes have also important differences in their focuses. This is consistent with the analysis of Man (2006) who pointed out several approaches to entrepreneurial learning in use: Experiential, cognitive/affective, networking and competency approaches. Using this framework, we can clearly see that Lund University focuses on experiential approach (letting its students experience the process of entrepreneurship) and networking approach (facilitating interaction of students with the community of technology researchers). The BI programme primarily employs cognitive/affective approaches to learning (with the elements of other approaches), while UiO adopts a mixture of these ways of learning.

Another reference framework for analysis of the study programmes is suggested by Jamieson (1984). Using his distinction, we can claim that BI is inclined towards "*about* enterprise" approach to education, Lund employs a "*for* enterprise" approach (the administrator of the programme calls it *in* enterprise), whereas UiO can be thought of as laying somewhere in between.

The different focuses of three universities in teaching entrepreneurship could be attributed to the fact that there are numerous definitions of entrepreneurship, as asserted by Henry, Hill and Leitch (2003). Each university may have its own interpretation of entrepreneurship. Thus, we consent that there is no "one size fits all" for entrepreneurship teaching (Sijde et al. 2008).

5.3. What is the (desired) essence of entrepreneurship education?

As we found out, the cognitive maps of entrepreneurship represented by three graduate programmes to a various degree differ from the model based on the cognitive maps of entrepreneurs. This is not a surprising result, taking into account that the framework of university programmes may have some rather basic differences from the very essence of entrepreneurship: the academic rigour and the research-based justification for the context of valid knowledge, yet quick analysis and the fast-moving opportunity seizure on the other side.

At the same time, there are considerable differences between the analysed programmes. It is particularly noteworthy that the mental map of the graduate programme at Lund University resembles the entrepreneurs' model the most. There are several foundations of this programme that create this resemblance. 1) The essence of the studies is a programme-long (one-year long) entrepreneurial project, while all subjects in the curriculum are logically related to this project. 2) Working on such a project assures that the students in part learn entrepreneurship by experiencing it. 3) Another of the constituting factors of the programme in Sweden is its reliance on the internal community of technology researchers within the university. Thus, entrepreneurship students do not merely work with their own ideas but also assist in commercializing cutting-edge technological projects. 4) By building up this kind of student-researcher networks, Lund attempts to socially

influence the entrepreneurial attitudes of the students (the idea of this approach is that one tends to be more entrepreneurial if one is surrounded by a network of people involved in entrepreneurship).

To be fair, both BI and UiO have these four elements integrated in their study programmes to a lesser degree as well. Yet these two programmes are more academic of kind. One of the most striking evidences of this is that both BI and UiO students conclude their studies with the research-based master thesis. In addition, both of these programmes are labelled “Master in Innovation and Entrepreneurship”. The former part – innovation – is usually thought of as associated with more academic theory.

One can argue that the university setting must of course be academic-based. Its ultimate difference from the institutions providing vocational training is evident and needs to be preserved. Yet as our study shows, educating researchers and educating entrepreneurs are two quite different (some would say, opposite) matters. Thus, it seems appropriate to ask: If a study programme targets both future researchers as well as nascent entrepreneurs, can it possibly succeed with providing a quality education for any of the two?

No doubt both experiential and cognitive approaches are needed in educating future entrepreneurs. An entrepreneur knows how to present his or her ideas and having good selling skills will not alone be sufficient to build up a substantial value-creating business without being knowledgeable about the economic, the social and the legal environment, as demonstrated by our study. Thus, the possible road to success lies firstly, in the appropriate combination of the learning by doing principle and the acquiring of general entrepreneurship and business knowledge, and secondly in focusing on the proper elements of entrepreneurial thinking.

5.4. Conclusions and recommendations for programmes in entrepreneurship

With the help of cognitive mapping, we identified some deviances between practising entrepreneurs and entrepreneurship curricula, and thereby offer our advice as follows:

More attention to selection of the students with the right attitudes would seem to be appropriate. One way to ensure entrepreneurial attitudes among the students is to conduct a comprehensive interview process as Lund does. Not only motivation letter is mandatory, but also personality test, face-to-face interviews and students' video presentations are adopted to evaluate the applicants.

Focus on employee management and human networks should be enhanced. Entrepreneurship as an area is based on building up productive relationships – a fast-growth venture can hardly succeed without being led by a proper team, having good employee relations and carefully chosen partners.

Equal importance of financial management and marketing/sales skills also seems important. Since entrepreneurial success is measured by achievement of financial results and ability to create value for customers, financial management and marketing are topics that have to be substantially covered within a curriculum of entrepreneurship education.

Coverage of topics associated with the early stage of an enterprise should be balanced with topics covering later phases. It is important to not only cover the start-up phase of an enterprise but also to teach students about the later stages of an enterprise, focusing on the factors influencing its eventual success such as building up sound business relations, attracting loyal clients and motivated employees – in order for instance to be able to grow and scale-up a business venture.

Highlighting the importance of creating value as an entrepreneurial outcome as core. Our study shows that practising entrepreneurs treat both financial success as well as creating user value as equally important outcomes of their activities. Without aiming at achieving value for clients, society and employees, it is probably hard to expect financial success either.

A more practical, experiential approach to teaching entrepreneurship would probably benefit real learning. Most entrepreneurs assert that the best way to learn entrepreneurship is to "live" it. We do not deny the importance of theoretical approaches, since both analytical and experiential cognition are obviously required (Barbosa, Kickul and Smith 2008). However, in some of the study

programmes we analysed, there is a tendency to mainly adhere to the traditional classroom teaching.

Increased nurturing of the networking approach is important. Students should be given possibilities to interact more with the business community and the researchers. One important expression of such an approach is more collaboration between the business department that the students of entrepreneurship usually belong to, and the technology faculties of the universities, the science parks, the research institutes and the industrial associations.

Increased shift from focus on teaching to focus on experience based learning. Several practising entrepreneurs stressed the importance of having dedicated coaches and experienced mentors who can help young people orienting themselves through all the challenges. Structured self-reflection should be part of the learning process. Students could also be given more control of their learning plan.

5.5. Methodological lessons and further research suggestions

Cognitive mapping as a research tool has proven to be very useful for analysing and highlighting the most important elements of a phenomenon contained in human experience, attitudes and opinions. However, the method is time-consuming and bears the risk of having to make too many arbitrary decisions when constructing the mental maps.

As for the potential areas of further research, in our study we did not touch upon how relationships between different concepts in the entrepreneurs' experience corresponded to university programmes. We believe this is worthy of further investigation. In regards to the results of our study, we found that there is a discrepancy between relatively low concern for business ethics but high focus on sound business relations in representations of entrepreneurial experience, attitudes and opinions. On the other hand, risk-taking has come up as a particularly relevant area according to entrepreneurs, yet it is unclear how and to what extent it should be included in the curricula of entrepreneurship teaching. These topics are certainly interesting to further studies.

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Figure 1: FEW STUDIES ATTEMPT TO LINK ENTREPRENEURSHIP PROGRAMMES AND ENTREPRENEURS' VIEWS

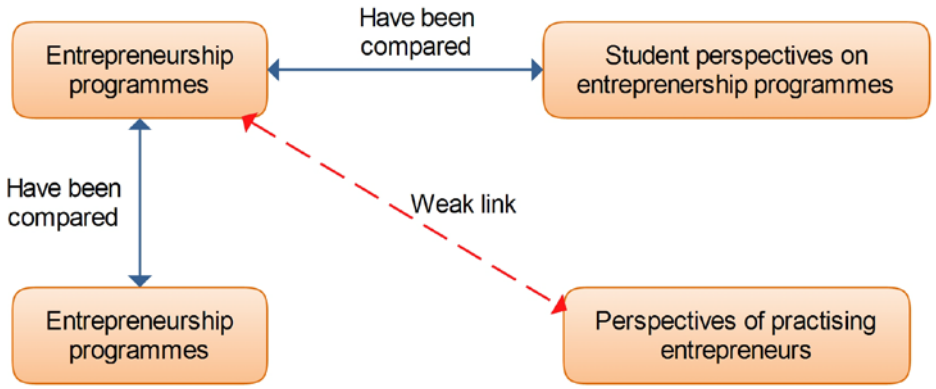

Figure 2: EXAMPLE OF A CAUSAL RELATIONSHIP IN THE MENTAL MAP

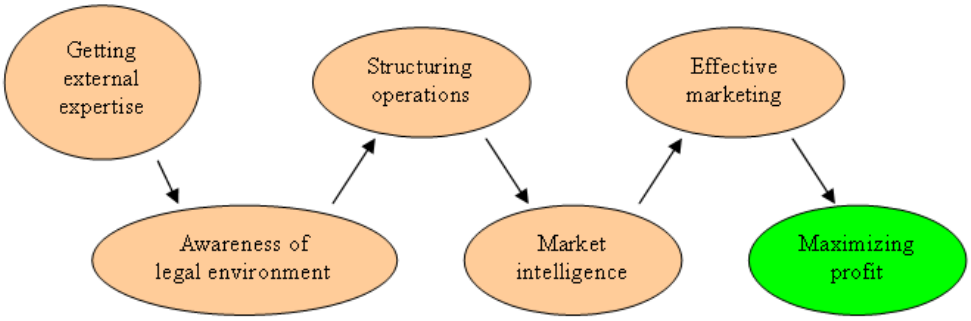

Figure 3: EXAMPLE OF AN ASSOCIATIVE RELATIONSHIP IN THE MENTAL MAP

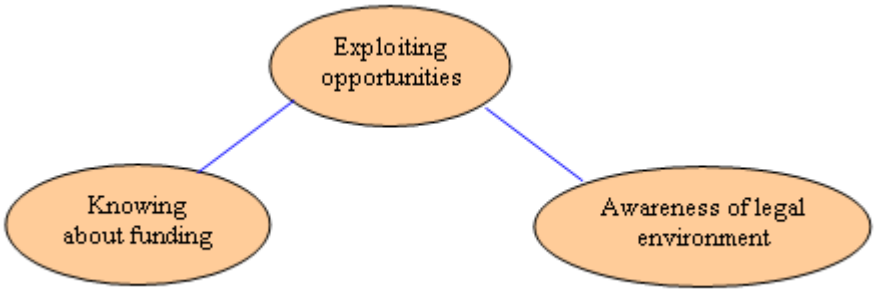

Figure 4: INITIAL COLLECTIVE MENTAL MAP OF ENTREPRENEURS' EXPERIENCE

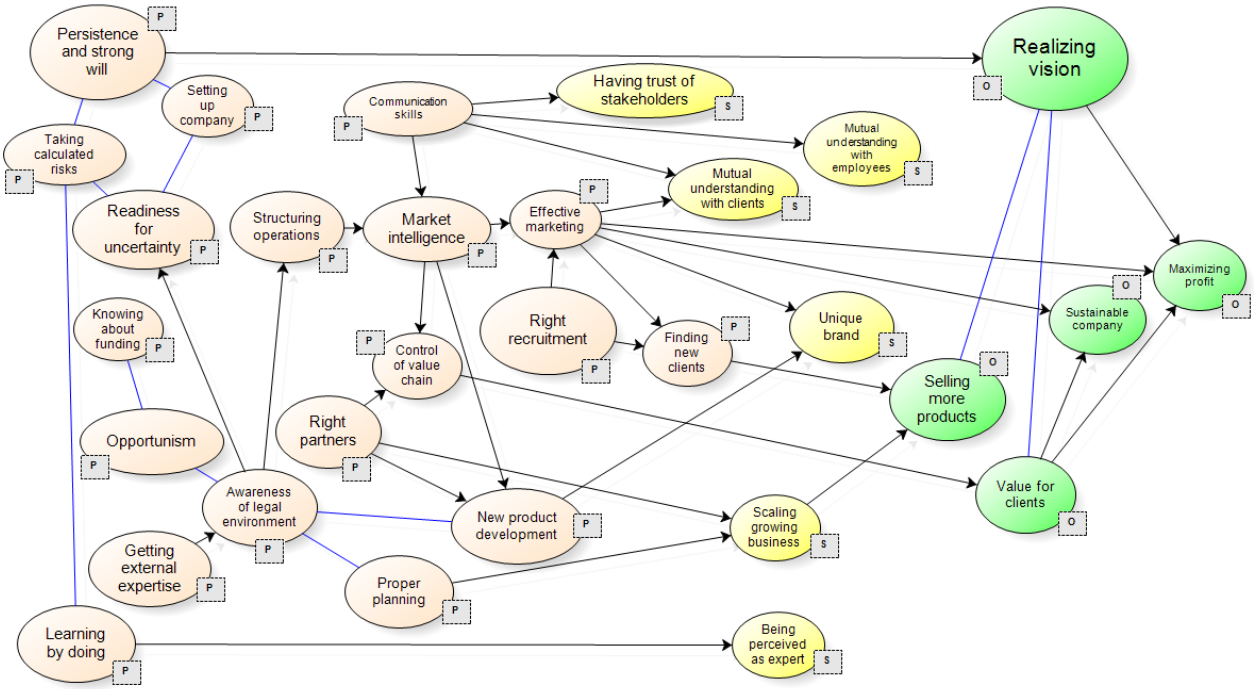

Figure 5: CLUSTERED MENTAL MAP OF ENTREPRENEURS' EXPERIENCE

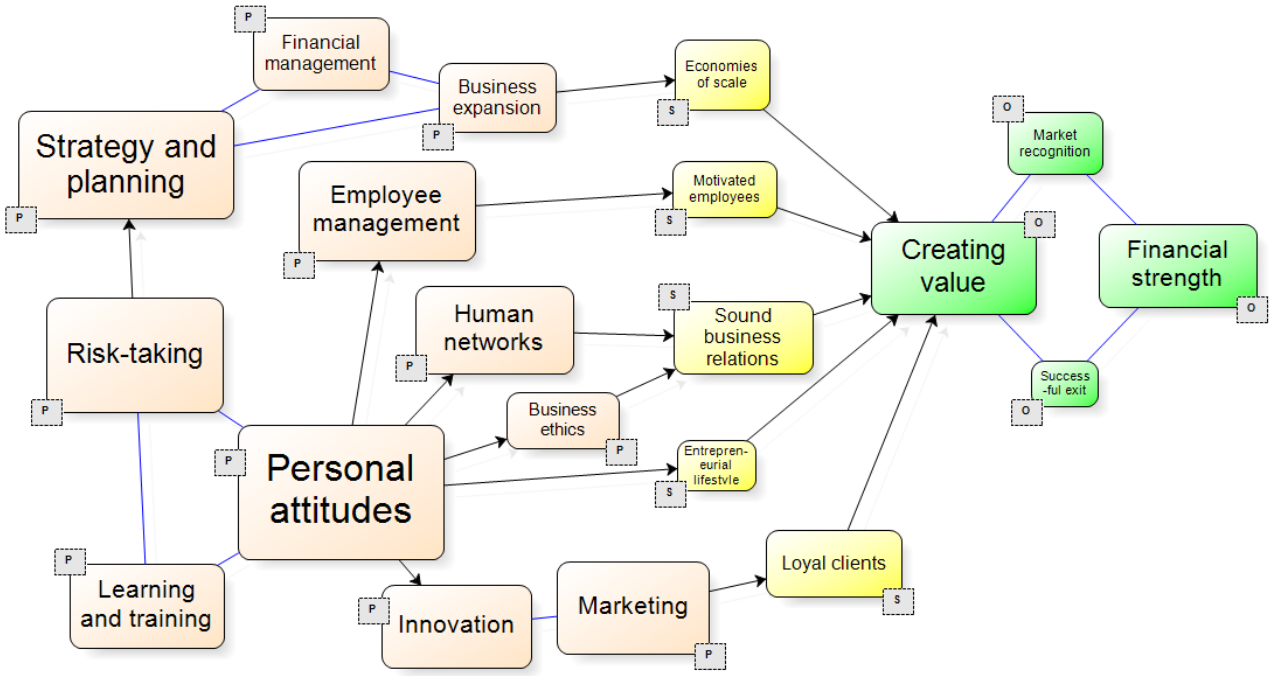

Figure 6: CLUSTERED MENTAL MAP OF THE MASTER PROGRAMME IN INNOVATION AND ENTREPRENEURSHIP AT BI NORWEGIAN SCHOOL OF MANAGEMENT

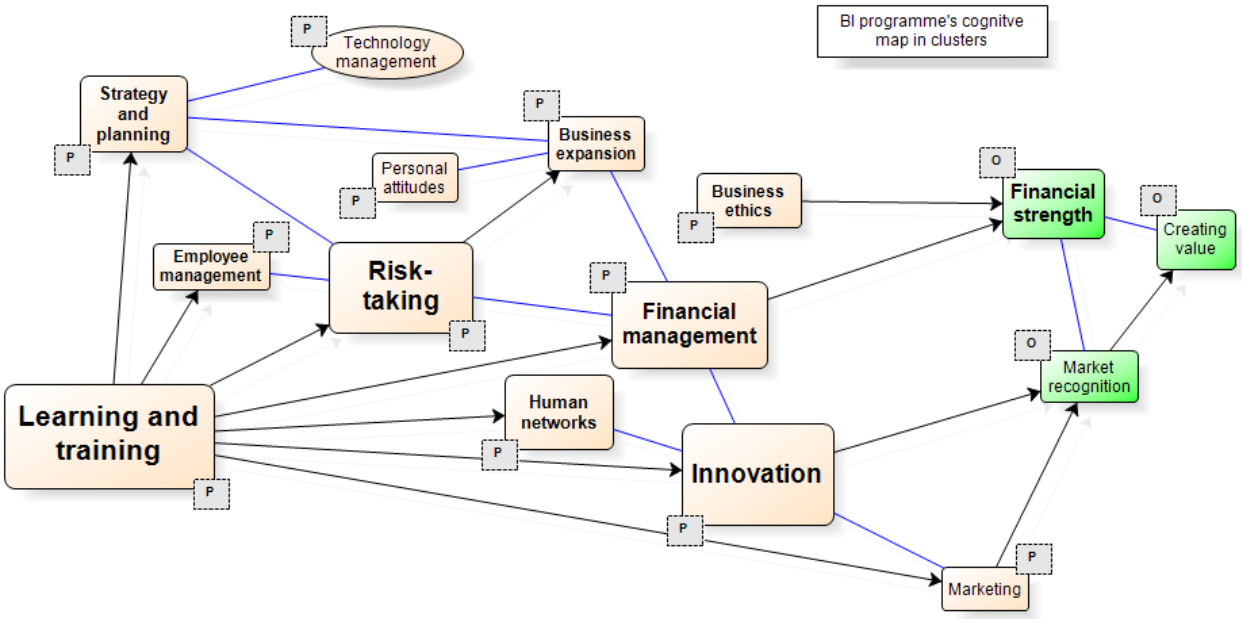

Figure 7: CLUSTERED MENTAL MAP OF THE MASTER PROGRAMME IN INNOVATION AND ENTREPRENEURSHIP AT THE UNIVERSITY OF OSLO

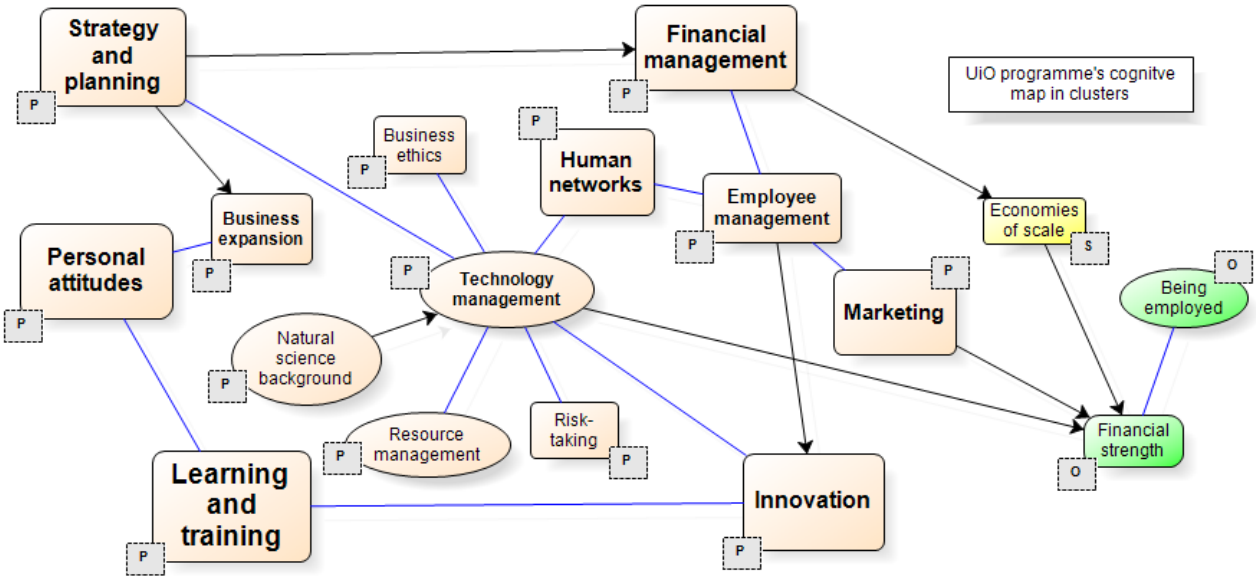

Figure 8: CLUSTERED MENTAL MAP OF THE MASTER PROGRAMME IN ENTREPRENEURSHIP AT THE LUND UNIVERSITY

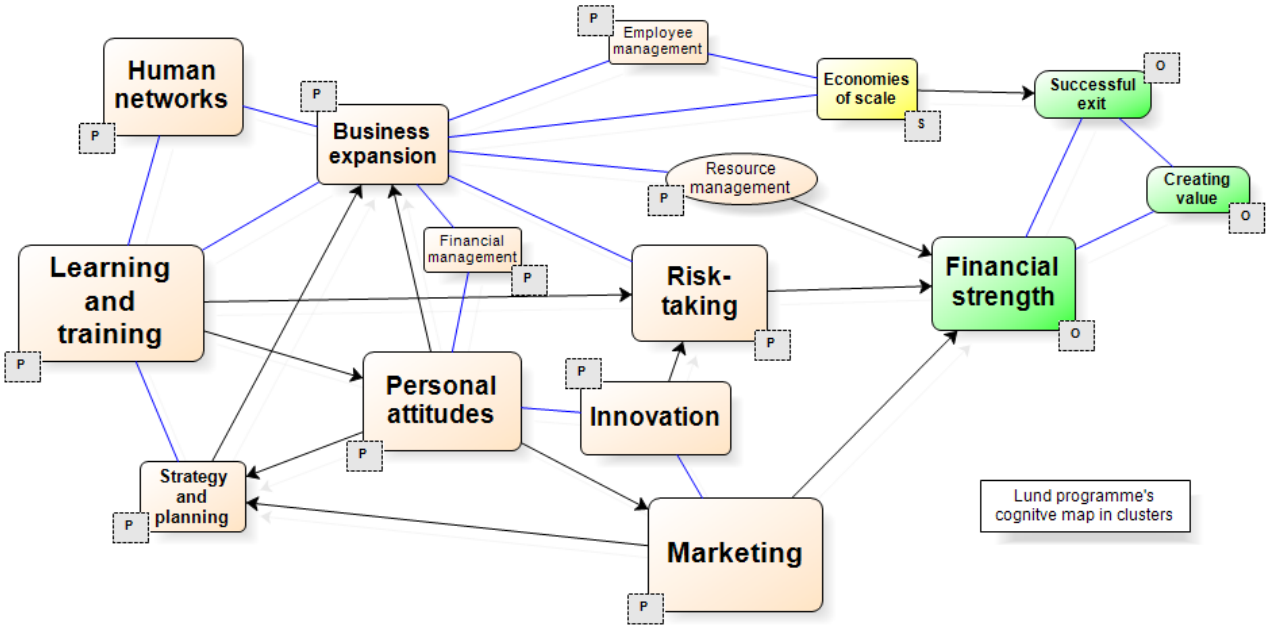

Table 1: LIST OF INTERVIEWED ENTREPRENEURS

Code of entrepreneur	Nationality	Age	Gender	Industry (-ies)	Years as an entrepreneur	No. of staff
EN01	Chinese	39 y.	Male	Trade within bicycle business	9	9
EN02	Norwegian	44 y.	Male	Software development	11	13
EN03	German	52 y.	Male	Trade of garments between China and Germany	4	5
EN04	Norwegian	53 y.	Male	Audiological devices	17	14
EN05	Estonian	34 y.	Male	Corporate strategy consulting	8	1 + 5 freelance
EN06	Kazakh	46 y.	Female	Public relations services, HR and ISO consulting, corporate training	17	30
EN07	Kazakh	40 y.	Male	Oil extraction, oil trade, agriculture, real estate, ice cream chain franchise	13	About 40
EN08	Chinese	43 y.	Male	Investment, ICT, stock broking, food and beverage motel, property development	15	About 100
EN09	Norwegian	53 y.	Male	IT recruitment and consultancy	13	3

Table 2: LIST OF STORIES FROM BLOOMBERG BUSINESSWEEK
(http://www.businessweek.com/smallbiz/journals**)**

Story code	Title of a story	Age	Gender	Industry (-ies)	Years as an entrepreneur	Published date
BW01	Learning from a social entrepreneur	28 y.	Male	Real estate	6	21.03.2008
BW02	To recruit the best, admit weakness	30 y.	Male	Online retailer	4	29.12.2009
BW03	Making a do-gooder's business model work	32 y.	Male	Shoes manufacturing	4	23.01.2009
BW04	Getting the startup equation right	40 y.	Female	Consultancy	4	23.02.2010
BW05	Managing growth in a pet-insurance business	36 y.	Male	Pet insurance	4	24.04.2009
BW06	How we started a liquor brand	29 y.	Male	Liquor	4	22.05.2009
BW07	Creating Café Barcomi's in Berlin	46 y.	Female	Café and restaurant	17	25.09.2009
BW08	Making the most of a second act	44 y.	Male	Online movies and photos	4	23.08.2008
BW09	Building a cosmetic brand from scratch	42 y.	Female	Cosmetics	6	20.07.2007
BW10	Iman's mass distribution model	53 y.	Female	Cosmetics & accessories	16	03.03.2009
BW11	A high-school senior sells into Wall-Mart	17 y.	Female	Hair care products	4	03.10.2008
BW12	Custom-building a life	32 y.	Male	Restaurant	7	18.01.2008
BW13	Celebrating the small stuff	38 y.	Male	Financial serv. & publishing	15	18.04.2008
BW14	Turning a failing restaurant around	41 y.	Male	Restaurant	9	25.11.2008
BW15	Selling business with social mission attached	62 y.	Female	Café and restaurant	27	19.02.2010
BW16	Moving home to expand the family business	31 y.	Male	Family catering	7	23.10.2009
BW17	Why Brooklyn industries manufactures in China	39 y.	Male	Manufacturing and retailing	16	20.1..2009
BW18	A $100,000 education for newbie inventors	51 y.	Female	Sports shoes manufacturing	5	31.03.2009
BW19	Build A-bear's founder shares her story	57 y.	Female	Retailing of kids' toys	13	17.09.2007
BW20	Struggling with temporary worker visa process	61 y.	Female	Landscape design	18	31.07.2009
BW21	Female ownership matters	51 y.	Female	Bakery	16	15.10.2007
BW22	Doing business in Afghanistan	32 y.	Female	Art and craft	7	22.08.2008
BW23	Richard Branson's latest venture	57 y.	Male	Virgin Group	44	25.07.2007
BW24	When pickles are your life's calling	44 y.	Male	Food	7	12.12.2007
BW25	Dogfish head: brewing up relationships	38 y.	Male	Beer	15	19.11.2007
BW26	Sammy Hagar's tequila super group	59 y.	Male	Liquor	18	20.06.2007
BW27	Expanding honest tea without diluting its brand	43 y.	Male	Tea	12	19.12. 2008

Table 3: LIST OF STUDY PROGRAMMES

	BI Norwegian School of Management (Norway)	University of Oslo (Norway)	Lund University (Sweden)
Interviewed administrator	Knut Sogner	Truls Erikson	Tomas Karlsson
Programme title	Innovation & Entrepreneurship	Innovation & Entrepreneurship	Entrepreneurship
Target	Those wishing to be entrepreneurs or become involved with innovation	Those individuals who are interested in combining their science background with innovation and entrepreneurial thinking	Graduates who want to start up businesses
Requirement	Completed Bachelor's Degree	Students with a Bachelor's Degree within mathematics, natural science or technology	Completed Bachelor's Degree
Duration	2 years	2 years	1 year
Course content	• Theories of business and economic development • Research methodology • Financial management • Applied microeconomics • New venture creation • Theories of innovation • Corporate innovation • Innovation, sectoral application • Legal framework for IPR • New product development and service innovation • Financing innovation and entrepreneurial ventures • International perspectives on innovation • Technology strategy and strategic technology • Leadership and strategies • Managing innovation, design and creativity • Applied business ethics (Aug 2010) • Thesis	• Marketing mgt • Financial mgt • From idea to business • Dynamic organizing • Innovation strategies & mgt • Ideation and feasibility studies • Norwegian practical start-up experience • Research design • Practical innovation mgt • 2 specialized studies • Thesis	• Introduction to the entrepreneurial process • Opportunity recognition • Entrepreneurial decision making • Teamwork in the new venture creation process • Introduction to business planning • Industry and competitor analysis • Customer analysis and market research • Writing a marketing plan • Market Exploitation and Resource Acquisition • Managing New Venture Growth • Entrepreneurial project

Table 4: OVERVIEW OF THE CLUSTERS WITH RESPECTIVE NODES

POTENTIAL OPTIONS			STRATEGIC DIRECTIONS	OUTCOMES AND GOALS
Business ethics	**Innovation**	**Personal attitudes**	**Economies of scale**	**Creating value**
Ethical behavior	Creativity	Ability for quick analysis	Saving costs	Realizing vision
Long-term focus	Good business idea	Ambition	Scaling growing business	Value for clients
Strong values	Ignoring industry practice	Communication skills		Value for society
	Matching clients with product	Desire to make revenues	**Entrepreneurial lifestyle**	Opportunities for employees
Business expansion	New product development	Hard work	Entrepreneurial lifestyle	
Internationalization	Using different perspective	Passion		**Financial strength**
Licensing		Patience	**Loyal clients**	Economic independence
Outsourcing	**Learning and training**	Persistence and strong will	Mutual understanding	Maximizing profit
Setting up company	Awareness of econ. environment	Positive thinking	with clients	Selling more products
Understanding cultural diff.	Awareness of legal environment	Professional attitude	Unique brand	Sustainable company
	Awareness of social environment	Sefl-condifence		
Employee management	Getting education & training	Working indepentently	**Motivated employees**	**Market recognition**
Adequate leadership	Learning by doing		Mutual understanding	Innovative product
Celebrating success		**Strategy and planning**	with employees	Leadership in quality
Delegation skills	**Marketing**	Business focus	Productive employees	Recognition
Fair rewards to employees	Effective marketing	Control of ownership		
Firing people when needed	Find new clients	Control of value chain	**Sound business relations**	**Successful exit**
Hiring people better than me	Knowing your customer	First-mover advantage	Being perceived as expert	Successful exit
Proper team management	Market intelligence	Flexibility in running business	Having trust of stakeholders	
Right recruitment		Proper planning	Networks	
	Natural science background	Strategic fit		
Financial management	Natural science background	Structuring operations		
Cash flow management		Targeting for departure		
Knowing about funding	**Resources management**	Time management		
Knowing accounting	Resources management			
Realistic budgeting		**Technology management**		
	Risk-taking	Technology management		
Human networks	Diversifying revenues			
Getting external experise	Initiation			
Leverage renowned clients	Exploiting opportunities			
Relationship management	Readiness for uncertainty			
Right partners	Taking calculated risks			

Table 5: SIGNIFICANCE OF DIFFERENT CLUSTERS IN VARIOUS MENTAL MAPS

	Entrepreneurs	BI	UiO	Lund
POTENTIAL OPTIONS				
Personal attitudes	☆☆☆☆☆	☆☆	☆☆☆☆	☆☆☆☆
Strategy and planning	☆☆☆☆	☆☆☆	☆☆☆☆	☆☆
Risk-taking	☆☆☆☆	☆☆☆☆	☆	☆☆☆☆
Employee management	☆☆☆☆	☆☆	☆☆☆	☆
Human networks	☆☆☆	☆☆☆	☆☆☆	☆☆☆☆
Learning and training	☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆
Innovation	☆☆☆	☆☆☆☆	☆☆☆☆	☆☆
Marketing	☆☆☆	☆	☆☆☆	☆☆☆☆☆
Financial management	☆☆	☆☆☆☆	☆☆☆☆	☆
Business expansion	☆☆	☆☆	☆☆	☆☆☆
Business ethics	☆	☆☆	☆	
Techonology management		☆☆☆	☆☆☆☆	
Resource management			☆☆☆	☆☆☆
STRATEGIC DIRECTIONS				
Sound business relations	☆☆☆☆☆			
Loyal clients	☆☆☆☆			
Motivated emloyees	☆☆☆			
Economies of scale	☆☆☆		☆☆☆	☆☆☆☆
Entrepreneurial lifestyle	☆☆			
OUTCOMES AND GOALS				
Creating value	☆☆☆☆☆	☆☆☆		☆☆
Financial strength	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆	☆☆☆☆☆
Market recognition	☆☆	☆☆☆		
Successful exit	☆			☆☆

**The arbitrarily set number of stars represents the relative significance of a cluster. It is determined by (a) the number of nodes (concepts) which a cluster contains; and (b) the number of entrepreneurs having mentioned contained concepts.*