

Haugane, Helena Koch
Saastad, Karoline

Entrepreneurial Passion in a Venture Creation Program

A Mixed Method Study of how Educational Experience is related to Entrepreneurial Passion, and how Critical Learning Events among prior students in a Venture Creation Program affect this relationship

Master's thesis in NTNU School of Entrepreneurship

Supervisor: Aadland, Torgeir

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Abstract

Entrepreneurial passion is considered to play an important role in entrepreneurship (Melissa S. Cardon, Wincent, Singh, & Drnovsek, 2009). A few scholars have found that the entrepreneurial learning process can contribute to a person's entrepreneurial passion (Dermol, 2010), but the literature asks for a deeper understanding of how entrepreneurial learning affects the development of a passion for entrepreneurship (Zainuddin, Mukhtar, Hasan, & Ali, 2019). Entrepreneurship education has been presented as an adequate approach to establish an entrepreneurial learning environment (Idris, Mukhadis, Pali, Akbar, & Iop, 2018). Further, a growing number of entrepreneurial education programs has arisen (Arpiainen & Tynjälä, 2017), which has resulted in more attention towards action-based entrepreneurship programs (Rasmussen & Sørheim, 2006). The emergence of action-based entrepreneurial programs has resulted in the term venture creation program (Donnellon, Ollila, & Williams Middleton, 2014). This entrepreneurship program facilitates for entrepreneurial learning by applying a real-life venture as the primary learning vessel (Lackeus, 2013).

The study applies a mixed method approach, including quantitative and qualitative research designs, to investigate entrepreneurial passion in a venture creation program context. The literature indicates a link between venture creation program and entrepreneurial passion. Since there is lacking research on this field – the authors investigate how the educational experiences (entrepreneurial competence acquired) in a venture creation program relate to entrepreneurial passion. This is done by applying a quantitative approach using an existing cross-sectional study investigating the relationship between educational experience and entrepreneurial passion, and how a venture creation program has an effect on this relationship. The results from the quantitative analysis laid the basis for the qualitative case-study, with in-depth interviews for data acquisition. When studying entrepreneurial learning in education, the literature lacks sufficient arguments explaining how entrepreneurs learn. However, growing evidence shows that significant "events" influence the entrepreneurial process, known as critical learning events (Cope, 2005). In the qualitative part of the thesis, the authors, therefore, further investigated how these critical learning events relate to entrepreneurial passion among graduates that participated in a venture creation program in Norway.

The findings of the study found that the main dimension of passion experienced in a venture creation program was passion for inventing. In addition, there exist critical learning events, and educational experience acquired, which positively influence graduates' entrepreneurial passion, mainly through social-and networking activities.

Sammendrag

Entreprenøriell lidenskap er ansett for å ha en viktig rolle i entreprenørskap (Melissa S. Cardon et al., 2009). Et par forskere har presentert at den entreprenørielle læringsprosessen kan bidra til å få entreprenøriell lidenskap (Dermol, 2010), men litteraturen ønsker en dypere forståelse av hvordan den entreprenørielle læringsprosessen påvirker utviklingen av entreprenøriell lidenskap (Zainuddin et al., 2019). Entreprenørskapsutdanning anses for å være en gunstig arena for å fasilitere for entreprenøriell læring (Idris et al., 2018). I tillegg viser litteraturen til et økende antall utdanningsprogrammer innen entreprenørskap (Arpiainen & Tynjälä, 2017), som har resultert i et større fokus på "action-based"-entreprenørskapsprogrammer. Oppblomstringen av slike programmer har resultert i begrepet "venture creation programs" (Donnellon et al., 2014). Denne typen utdanningsprogram fasiliteter for entreprenøriell læring ved bruk av oppstartsbedrifter som et læringsverktøy (Lackeus, 2013).

Denne studien bruker et "mixed-method"-design som inkluderer både kvantitativ og kvalitativ forskningsmetode, for å undersøke entreprenøriell lidenskap i en "venture creation program". Litteraturen indikerer en link mellom entreprenøriell lidenskap og "venture creation programs". På grunn av lite forskning på dette feltet, så undersøker oppgaven hvordan entreprenøriell utdanningskompetanse tilegnet i en "venture creation program" kan relateres til entreprenøriell lidenskap. Dette blir gjennomført ved hjelp av en kvantitativ metode ved bruk av en eksisterende tverrsnittstudie som undersøker sammenhengen mellom entreprenøriell utdanningskompetanse og entreprenøriell lidenskap, samt om et "venture creation program" har effekt på denne sammenhengen. Resultatene fra den kvantitative analysen la grunnlaget for den kvalitative casestudien med dybdeintervjuer som datainnsamling. Entreprenøriell læring i utdanningssammenheng mangler tilstrekkelige forskning som forklarer hvordan entreprenører lærer. Dette har ført til mer fokus på tydelige situasjoner som påvirker den entreprenørielle prosessen, definert som "critical learning events" (Cope, 2005). I den kvalitative delen av studien vil forfatterne videre undersøke hvordan slike "critical learning events" er relatert til entreprenøriell lidenskap blant uteksaminerte studenter fra et "venture creation program" i Norge.

Funnene fra studiene viser at "passion for inventing" er dimensjonen av lidenskap som oppleves hyppigst i et "venture creation program". I tillegg viser studien at det finnes en positiv sammenheng mellom den entreprenørielle lidenskapen til de uteksaminerte studentene og "critical learning events" opplevd, samt entreprenøriell utdanningskompetanse tilegnet seg i programmet. Dette skjer i hovedsak gjennom aktiviteter som legger til rette for sosialisering og etablering av entreprenørielle nettverk.

Preface


This master thesis is written by two master students at NTNU School of Entrepreneurship through the Department of Industrial Economics and Technology Management (IØT) at the Norwegian University of Science and Technology (NTNU).

The authors want to express their sincere gratitude to their supervisor, Torgeir Aadland, for his patience and positivity, his valuable feedback and encouragement, and sharing his wisdom and insight. We could not have done it without him, and his reflection has been priceless for the research. Additionally, the authors want to thank NTNU School of Entrepreneurship of the opportunity to use the existing dataset when conducting the quantitative analysis, making it possible to conduct a mixed method in this research.

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Helena Koch Haugane



Karoline Saastad

Abbreviations

The following abbreviations have been used in this thesis.

VCP Venture Creation Program

NSE NTNU School of Entrepreneurship

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1 Introduction

1.1 Background

Passion is a well-studied concept in psychology (R. J. Vallerand et al., 2003), and in 1951, researchers started to include passion when they explained entrepreneurial behaviour (Schumpeter, 1951). Today, entrepreneurial passion is considered to play an important role in entrepreneurship (Melissa S. Cardon et al., 2009). Entrepreneurial scholar explains the presence of passion as the entrepreneur's capability to view the venture as something they love, rather than "work" or "tasks" (Baum, Locke, & Smith, 2001; Melissa S. Cardon et al., 2009; R. J. Vallerand et al., 2003). Entrepreneurial passion literature tends to research the construct based on its outcomes, (Arshad, Farooq, & Afzal, 2018; Baum et al., 2001; Botha & Taljaard, 2019; M. S. Cardon & Kirk, 2015; Drnovsek, Cardon, & Patel, 2016; B. A. Mueller, Wolfe, & Syed, 2017; Pekka Stenholm, Nielsen, & Klyver, 2017), and few studies investigate how entrepreneurial passion emerge (Murnieks, Mosakowski, & Cardon, 2014).

However, the literature on entrepreneurship learning has started to investigate how entrepreneurial passion is affected by the entrepreneurial learning process. A few scholars have found that the entrepreneurial learning process can contribute to a person's entrepreneurial passion, e.g. (Dermol, 2010; Idris et al., 2018). Robert J Vallerand (2008) emphasizes the importance of the learning experience as a basis for the development of passion. This is because increased knowledge gained in the entrepreneurial process might facilitate for stronger passion for entrepreneurship (Dermol, 2010). Still, the literature asks for a deeper understanding of how entrepreneurial learning affects the development of a passion for entrepreneurship (Zainuddin et al., 2019). Further, literature states that learning that takes place within an entrepreneurial context, often is experiential in nature (Collins & Moore, 1970; Deakins & Freel, 1998; Minniti & Bygrave, 2001; Reuber & Fischer, 1993; Sarasvathy, 2001; Sullivan, 2000). This has resulted in Kolb's (1984) Experiential Learning Theory being one of the most used learning frameworks in an entrepreneurship context. He defines learning as "*the process whereby knowledge is created through the transformation of experience*" (p. 38). This theory is also widely used in the context of entrepreneurship education (Idris et al., 2018) because entrepreneurship scholars present education as an adequate approach of establishing an entrepreneurial learning environment (Rae & Carswell, 2001).

A few scholars also indicate a connection between the entrepreneurial learning a student gain through participation in an entrepreneurship education program and the emerge of entrepreneurial passion, e.g. (Idris et al., 2018). However, the literature lacks research on this area (Arshad, 2018; Robert J Vallerand, 2008; Zainuddin et al., 2019). When investigating the entrepreneurial learning process in an entrepreneurship education context, Johannisson (1991) learning components have been used to measure entrepreneurial competence (knowledge, skills, and abilities) in an entrepreneurship education (Gibb, 1993; Johannisson, 1991; Ronstadt, 1985). This is referred to as an educational experience in this thesis. Educational entrepreneurship programs can be organized in many ways (Samwel Mwasalwiba, 2010), but when comprehending how entrepreneurs learn, there has been a shift towards a shared recognition that entrepreneurs are action-oriented and much of their learning is experimentally based (Rae & Carswell, 2001). The interest in the field of action-based approaches in entrepreneurship

education has resulted in the term venture creation program (Adams, 2016; Donnellon et al., 2014).

A venture creation program (hereafter referred to as VCP) is *"an entrepreneurship education program which utilizes the on-going creation of a real-life venture as the primary learning vessel"* (M. Lackéus, 2015, p. 65). Such a program further emphasizes an experiential learning approach (Kolb, 1984), focusing on learning-by-doing in group settings and a network context (Burgoyne & Hodgson, 1983; Marsick & Watkins, 1990; Ollila & Williams-Middleton, 2011; Rasmussen & Sørheim, 2006). An underlying objective of a VCP is to develop student's entrepreneurial competencies (knowledge, skills, and abilities) (M. Lackéus, 2015). Further, the literature highlights entrepreneurial passion as an important construct in the entrepreneurial process (Melissa S. Cardon et al., 2009), which is the primary learning vessel in a VCP (M. Lackéus, 2015). The concept is rare, and the majority of the VCPs are newly established (Adams, 2016; G. Hägg, 2017; Samwel Mwasalwiba, 2010). However, there is a growing trend of adopting this approach in entrepreneurial education (M. Lackéus, 2015; Lockyer & Adams, 2014), which has resulted in the request for more research on the context of VCP, e.g. (Støren, Johansen, & Spilling, 2015; Sæter, Aaboen, Konstad, & Widding, 2018).

As mentioned, the learning environment in a VCP builds on Kolb's (1984) experiential learning theory. However, this theory has also received much criticism since it de-contextualizes and only accounts for limited factors influencing the entrepreneurial learning process (Kayes, 2002; M. Reynolds, 1998; Vince, 1998). In addition to claiming that students learn experientially through the new venture creation process, research has started to investigate in which situations students learn (Corbett, 2005). Due to the lack of sufficient arguments when explaining how entrepreneurs learn, there has been a shift towards Cope's (2005) Dynamic Learning Perspective of entrepreneurship, which show growing evidence that significant "events" or "episodes" influence the entrepreneurial process (emphasized by Deakins & Freel, 1998). Cope (2000) and Rae & Carswell (2001) demonstrated how learning and adaptation are stimulated through discontinuities or events (Kolb, 1984), defined as "critical learning events". Cope (2003) states that these events have *"a prominent role to play in how entrepreneurs learn"* (p.436). There is little research on these critical learning events, but Martin Lackéus (2014) has studied critical learning events in a VCP and has found an indirect link to entrepreneurial passion.

1.2 Purpose and research question

The emergence of action-based entrepreneurial programs has resulted in the venture creation approach in educational programs (Donnellon et al., 2014). The literature indicates that entrepreneurial passion may play an important role in a VCP (Lackeus, 2013). Scholars express a lack of research on entrepreneurial passion in a VCP context (Sæter et al., 2018), and in early-stage entrepreneurial experiences (Arshad et al., 2018; Stroe, Wincent, & Parida, 2018). Previously, there has only been investigated an indirect relationship between VCPs and entrepreneurial passion, e.g. (Lackeus, 2014). The authors, therefore, investigated how the educational experiences of a VCP relate to entrepreneurial passion. Thus, the purpose of the thesis is to

investigate how educational experiences in a venture creation program relates to entrepreneurial passion.

This is done by applying a mixed method, combining both quantitative and qualitative research methods (Creswell & Clark, 2007). Conducting a mixed method provides a richer perspective (Arora & Stoner, 2009) of how participation in a VCP is related to entrepreneurial passion. The authors first investigated the relationship between educational experience and entrepreneurial passion and how a VCP moderated this relationship, by using an existing cross-sectional study in quantitative analysis (Ringdal, 2014). A quantitative method makes it possible to reveal if there exists such a relationship because it provides more quantified data (Arora & Stoner, 2009). Further on, in order to investigate more in-depth on how educational experience relates to entrepreneurial passion in a VCP, the authors conducted qualitative in-depth interviews of graduates of a VCP. The inclusion of a qualitative method offers a different perspective and a richer and more complex picture of the situation, providing the needed depth of understanding (Arora & Stoner, 2009).

Further, research has presented an indirect link between critical learning events in a VCP and entrepreneurial passion (Lackeus, 2014). However, entrepreneurial passion was not of primary interest in Lackeus' (2014) work; therefore, the authors will investigate how such critical learning events are related to the study's purpose. Thus, the research question for the qualitative part of this thesis is:

How do critical learning events relate to entrepreneurial passion among graduates that participated in a Venture Creation Program?

By doing this research, the authors contribute to filling the gap of research on entrepreneurial passion in a VCP context (Sæter et al., 2018), and to the research on the emergence of entrepreneurial passion, asked for by several scholars, e.g. (Melissa S. Cardon, Post, & Forster, 2017; Murnieks, Cardon, & Haynie, 2018; P. Stenholm & Nielsen, 2019). By investigating how entrepreneurial passion relates to the educational experience in a VCP, the study also contributes to entrepreneurship education literature, asked for by, e.g. (Rasmussen & Sørheim, 2006) and (Lackeus, 2013). This is done by presenting the effect of such a program. Lastly, the study incorporates the concept of "critical learning events" in a VCP and how these events are related to the emergence of entrepreneurial passion (Cope, 2005).

1.3 Structure of the thesis

A literature review on how entrepreneurial learning in a VCP is related to entrepreneurial passion, conducted by the authors in their project thesis, lays the basis for this study. In the next chapter, the theoretical foundation of the thesis is presented. The relevant literature on the main themes – entrepreneurial passion, entrepreneurial learning, and VCPs is elaborated. Furthermore, the mixed method methodology is introduced. Based on the sequential implementation, the conduction of the quantitative method is first described, followed by the description of the conduction of the qualitative approach. Following the sequential layout, the findings from each approach are presented separately in the next chapter. Lastly, the findings are discussed, followed by a conclusion, contribution, further research, and limitations of the study.

2 Entrepreneurial Passion, Entrepreneurial Learning and Venture Creation Programs

This chapter presents the theoretical foundation of this study. The quantitative research investigates the relationship between "Educational Experience" and "Entrepreneurial passion" and how a VCP moderate this relationship. In the qualitative analysis, the authors investigate more in-depth how educational experience in a VCP is related to entrepreneurial passion, and how critical learning events might be related to entrepreneurial passion in such a program. In order to fulfil this, the relevant theory is presented from the respective fields. Entrepreneurial passion theory is presented in the first part, followed by relevant entrepreneurial learning theory and finished by relevant theory on venture creation programs.

2.1 Entrepreneurial Passion

Passion is a well-studied concept in psychology (R. J. Vallerand et al., 2003), and in 1951, researchers started to include passion when they explained entrepreneurial behaviour (Schumpeter, 1951). Today, entrepreneurial passion is considered to play an important role in entrepreneurship (Melissa S. Cardon et al., 2009). Entrepreneurial scholars explain the presence of passion as the entrepreneur's capability to view the venture as something they love, rather than "work" or "tasks" (Baum et al., 2001; Melissa S. Cardon et al., 2009; R. J. Vallerand et al., 2003). Entrepreneurial passion literature tends to research the construct based on its outcomes, (Arshad et al., 2018; Baum et al., 2001; Botha & Taljaard, 2019; M. S. Cardon & Kirk, 2015; Drnovsek et al., 2016; B. A. Mueller et al., 2017; Pekka Stenholm et al., 2017), and few studies investigate how entrepreneurial passion emerge (Murnieks et al., 2014). Before 2009, all studies on passion were qualitative and primarily conceptual (Melissa S. Cardon et al., 2009), leading to the literature asking for more empirical research (Drnovsek et al., 2016; Murnieks et al., 2014). This implies that entrepreneurial passion is a relatively new, but an emerging field of study (Santos & Cardon, 2019). However, the last couple of years, the research has focused more on the development of entrepreneurial passion and more quantitative and empirical studies have been present in the literature (Botha & Taljaard, 2019; M. S. Cardon & Kirk, 2015; Murnieks et al., 2018; P. Stenholm & Nielsen, 2019; Stroe et al., 2018). Still, there is a need for more research on the development of the construct itself (Murnieks et al., 2018).

There exist several perspectives on passion, but the most used and well established are Vallerands' Dualistic Model and Cardons' Conceptual Viewpoint. R. J. Vallerand et al. (2003) Dualistic Model divide passion into two aspects; harmonious and obsessive passion. Harmonious passion is when an individual experiences positive feelings regarding an activity and experience well-being and happiness. Obsessive passion, on the other hand, forces individuals to continue with activities the person enjoys, even though it influences their life negatively (R. J. Vallerand et al., 2003). Melissa S. Cardon et al. (2009) was the first to define passion in an entrepreneurial context. Melissa S. Cardon et al. (2009) builds on R. J. Vallerand et al. (2003) Dualistic Model as a basis for the development of her theory (2009, p. 515). She conceptualizes entrepreneurial passion as *"consciously accessible, intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the*

self-identity of the entrepreneur". Since the thesis is investigating concepts within an entrepreneurial context, the authors will use the theory of Melissa S. Cardon et al. (2009) as the basis when studying passion in this study. The concept of entrepreneurial passion is closely related to the entrepreneurs' identity and emotions experienced in the entrepreneurial process (M. S. Cardon & Kirk, 2015; Murnieks et al., 2014). According to this theory (Melissa S. Cardon et al., 2009), entrepreneurial passion is divided into two essential components – "the experience of intense positive feelings" and "the centrality of entrepreneurial activities for an entrepreneurs' self-identity".

2.1.1 The experience of intense positive feelings

The first important component of Cardons' Conceptual Viewpoint of entrepreneurial passion is intense positive feelings. Melissa S. Cardon et al. (2009) refers to intense positive feelings as "consciously accessible", meaning that the feelings are intentionally experienced by the entrepreneur in the entrepreneurial process (M. S. Cardon & Kirk, 2015; Murnieks et al., 2014). Consistently, R. J. Vallerand et al. (2003) defines passion as a strong inclination toward an activity that people find important and therefore invest time and energy into the activity. The majority of literature involving passion relates the construct to intense and positive emotions that stimulate energy (Melissa S. Cardon et al., 2009). When talking about intense positive feelings, scholars, e.g. Seo, Barrett, & Bartunek (2004), suggest that these feelings may result in harder work and longer hours, as well as more challenging goals and increased creativity to handle challenges.

2.1.2 The centrality of entrepreneurial activities for an entrepreneurs' self-identity

The second component in Cardons' Conceptual Viewpoint of entrepreneurial passion is identity centrality. The definition of entrepreneurial passion express that passion is not only about emotions, but also related to your identity and who you are as a person (M. S. Cardon & Kirk, 2015; Melissa S. Cardon et al., 2009; Murnieks et al., 2014; R. J. Vallerand et al., 2003). More specifically, the intense positive feelings are experienced towards activities that are important and meaningful to an entrepreneur's self-identity (Melissa S. Cardon et al., 2009). In addition to the intensity of positive feelings, entrepreneurial passion implies a deep identity connected to the object of those feelings (Melissa S. Cardon et al., 2009). This indicates that the concept of entrepreneurial passion is closely related to an entrepreneur's identity and emotions experienced in the entrepreneurial process (M. S. Cardon & Kirk, 2015; Murnieks et al., 2014). Over the past years, entrepreneurial scholars have studied the relationship between entrepreneurial identity and entrepreneurial passion (Murnieks et al., 2018; Murnieks et al., 2014). Findings show that passion rises and falls in connection with entrepreneurial identity (Murnieks et al., 2014).

The experience of intense positive feelings and identity centrality towards different tasks and activities is associated with separate parts of the entrepreneurial process. (Melissa S. Cardon, Gregoire, Stevens, & Patel, 2013), therefore, divides entrepreneurial passion into different dimensions that entrepreneurs can be passionate about.

2.1.3 Dimensions of passion

Melissa S. Cardon et al. (2009) suggests that there exist three primary dimensions of passion – passion for inventing, passion for founding, and passion for developing:

1. **Inventing new products and services (hereafter passion for inventing).** Passion for inventing includes activities associated with scanning the environment for new market opportunities, developing new products or services, and working with new prototypes (Melissa S. Cardon et al., 2009). Some entrepreneurs search for innovative ideas deeper and more frequently than others (Katila & Ahuja, 2002), and the desire to deliver new solutions to the market is often an important motivator (Melissa S. Cardon et al., 2009).
2. **The process of founding a business (hereafter passion for founding).** Passion for founding is related to activities associated with birthing a new firm, getting the firm out to existence, or being the owner of the firm (Melissa S. Cardon et al., 2017). Other related activities are fixing the necessary financial, human and social resources needed to create a new venture (Melissa S. Cardon et al., 2009), and is often a principal motivator for many entrepreneurs (Aldrich & Zimmer, 1986). It can be, but not necessarily, an entrepreneur who has launched several new ventures in their careers (Melissa S. Cardon et al., 2013).
3. **Growing and developing a business (hereafter passion for developing).** Passion for developing includes activities related to the growth and expansion of a company after the founding (Melissa S. Cardon et al., 2009). These activities include for example finding new customers and employees, expanding the market for products or services, and pushing the company and its members to perform better (Melissa S. Cardon et al., 2013; Melissa S. Cardon et al., 2009). Entrepreneurs that experience passion for developing, typically enjoy activities such as increasing sales and finding external investors to fund their developments (Drnovsek et al., 2016).

The literature is currently mostly based on Cardon's (2009) definition, which indicates that her dimensions of passion are an established model in the literature on entrepreneurial passion. As mentioned, research on entrepreneurial passion requests further studies on how passion develops (Murnieks et al., 2014). The literature on entrepreneurship learning has started to investigate how entrepreneurial passion is affected by the entrepreneurial learning process, e.g. (Idris et al., 2018; Zainuddin et al., 2019). Scholars of entrepreneurial learning have found that the entrepreneurial learning process can contribute to a person's entrepreneurial passion, e.g. (Dermol, 2010; Idris et al., 2018). Robert J Vallerand (2008) emphasizes the importance of the learning experience as a basis for the development of passion. This is due to the increased knowledge gained in the entrepreneurial process, which might facilitate for stronger passion for entrepreneurship (Dermol, 2010). Still, the literature asks for a deeper understanding of how entrepreneurial learning affects the development of a passion for entrepreneurship (Zainuddin et al., 2019). Therefore, the authors will further investigate this connection, but first, present the theoretical foundation of entrepreneurial learning in this paper.

2.2 Entrepreneurial Learning

Entrepreneurial learning literature is confronted with the somewhat difficult task of trying to describe or define what learning involves (Politis, 2005). Traditionally, entrepreneurship

research has focused on entrepreneurial traits of successful entrepreneurs, but during the 1990s, this shifted towards understanding entrepreneurship as a continuous learning process (Politis, 2008). A better theoretical understanding of entrepreneurial learning is important because it is through learning entrepreneurs can grow and develop (Cope, 2000). Several frameworks are developed within the entrepreneurial learning discipline, focusing mainly on how entrepreneurs learn in the entrepreneurial process (Cope, 2005; Minniti & Bygrave, 2001; Pittaway & Thorpe, 2012; Politis, 2005; Rae, 2005; Rae & Carswell, 2001). Literature states that learning that takes place within an entrepreneurial context, often is experiential in nature (Collins & Moore, 1970; Deakins & Freel, 1998; Minniti & Bygrave, 2001; Reuber & Fischer, 1993; Sarasvathy, 2001; Sullivan, 2000). Within an entrepreneurship context, one of the most used learning frameworks is Kolb's (1984) experiential learning theory (Politis, 2005; Rae & Carswell, 2001).

2.2.1 Experiential Learning Theory

Kolb's (1984) Experiential Learning Theory defines the learning process as an iterative process where experience, reflection, thinking, and acting are central to the learning process. His work combines learning theories from John Dewey, Kurt Lewin, and Jean Piaget, where he highlights the essential role of experience in the learning process. Kolb (1984) emphasizes that experiential learning consists of mainly two dimensions - acquisition and transformation and defines learning as "*the process whereby knowledge is created through the transformation of experience*" (p. 38), and emphasizes that experiential learning consists of mainly two dimensions - acquisition and transformation.

In an entrepreneurial context, the dimension of acquisition refers to an entrepreneur's experience, which is a "*direct observation of, or participation in, events associated with new venture creation*" (Politis, 2005, p. 401). Several entrepreneurial scholars highlight the importance of an entrepreneur's experience (A. Fayolle, 2013; Kyrö, 2008; Rae & Carswell, 2001) (Cope, 2000; Minniti & Bygrave, 2001). Cope (2005) highlights the importance of considering how entrepreneurs learn from previous entrepreneurial experience. Reuber & Fischer (1999) illustrates that each entrepreneur enters the startup process with a "stock of experience", consisting of the background or history each individual has acquired up to that point. Entrepreneurial experience can be linked to the way entrepreneurs perceive new situations (Cope, 2005), and previous research has frequently pointed out the role of prior startup experience, as essential for entrepreneurial learning (Box, White, & Barr, 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). Several scholars argue for those entrepreneurs involved in starting up a business also seem to be more effective and successful in starting up and managing their second and third organization, e.g. (Lamont, 1972; Ronstadt, 1988; Starr & Fondas, 1992; Vesper, 1990; Wright, Westhead, & Sohl, 1998).

The dimension of transformation refers to experientially acquired knowledge, which is "*the practical wisdom resulting from what an entrepreneur has encountered*" (Minniti & Bygrave, 2001, p. 401) and represents the knowledge derived from an entrepreneur's experience (Politis, 2005). Minniti & Bygrave (2001) further acknowledges this, stating that "*entrepreneurs learn by updating their stock of knowledge accumulated on the basis of past experiences*" (p. 5). Entrepreneurial scholars have adapted these concepts of experiential learning theory, in order to understand the transformation of entrepreneur's experience into entrepreneurial knowledge (Johannisson, 1991; Minniti & Bygrave, 2001; Politis, 2005). Additionally, entrepreneurial knowledge has been associated with

knowledge acquired experientially (Cope, 2005; Deakins & Freel, 1998), since studies confirm that entrepreneurs learn by doing (G. Hägg, 2017).

Summarized, Kolb's (1984) definition of learning describes entrepreneurial learning as an experiential process where the personal experience of the entrepreneur is transformed into knowledge, which in turn can be used to guide the choice of new experiences (Politis, 2005). Entrepreneurship education has been presented as an adequate approach to establish an entrepreneurial learning environment (Idris et al., 2018; Rae & Carswell, 2001). In entrepreneurship education, the Experiential Learning Theory has been widely used in entrepreneurial education theory and practice (G. Hägg, 2017). This theory has played a prominent role in understanding how entrepreneurs learn (G. Hägg, 2017), and has led to more attention towards teaching methods influenced by action- and experience-based pedagogy in entrepreneurship education (Rasmussen & Sørheim, 2006; Roberts, 2012, 2015).

As presented, the literature asks for a deeper understanding of how entrepreneurial learning affects the development of a passion for entrepreneurship in an entrepreneurship education (Zainuddin et al., 2019). In order to investigate this connection and measure the entrepreneurial learning process, the authors draw upon work by Johannisson (1991) and G. Hägg (2017), by measuring the entrepreneurial competencies acquired in an entrepreneurship program.

2.2.2 Educational Experience

An essential part of entrepreneurship education is to develop entrepreneurial competencies (Fayolle & Gially, 2008) (Johannisson, 1991), and is seen as important when educating students to become entrepreneurs (Fayolle & Gially, 2008) (Johannisson, 1991). In order to measure entrepreneurial competencies acquired in entrepreneurship education Johannisson (1991) developed a learning taxonomy. Johannisson (1991) builds on Ronstadt's (1985) work, and presents five learning components which are supposed to cover the range of learning situations required in an entrepreneurship program in order to develop entrepreneurial competencies (Alain, Gailly, & Lassas-Clerc, 2006). This learning taxonomy defines five learning components – know-what (attaining the knowledge base and information for new venture development), know-how (acquiring the technical abilities and skills needed to develop a business), know-when (achieving the sharp intuition to act at the right moment), know-why (developing the right attitudes and motivation for startup) and know-who (fostering networks and contacts for entrepreneurial ventures).

Further on, the interrelation between these types of learning components has been little addressed in entrepreneurship literature, but some scholars have started to discuss this topic (G. Hägg, 2017). G. Hägg's (2017) study includes research from entrepreneurial learning and entrepreneurship education, where he highlights the importance of Johannisson (1991) learning components. Based on G. Hägg (2017) findings, he implies that entrepreneurship education is dependent on the stimulation of different types of competences in order to develop domain-specific knowledge required in entrepreneurship (Alexander, Schallert, & Hare, 1991). In this study, the authors, therefore, draw on Johannisson (1991) five learning components, with the basis of G. Hägg's (2017) findings. However, the authors argue that several of the learning components in some degree are complementary, and therefore merge them into three main components: "Knowledge and skills related to the entrepreneurial process" (representing know-what and know-how

competence), “Judgemental ability and decision making related to entrepreneurial action” (representing know-when and know-why competence), and “Social- and networking abilities” (representing know-who competence). In this study, the authors refer to these main components of learning as an educational experience. The different components are described in the following section, explaining the connection between the learning components that complement each other.

2.2.2.1 Knowledge and skills related to the entrepreneurial process

This component of educational experience relates to the knowledge and skills to cope with the creation of a new venture, and refer to the various tasks related to the venture creation process (P. D. Reynolds, 1997). It can be associated with the development of factual knowledge and skills, i.e. know-what (attaining the knowledge base and information for new venture development) and know-how (acquiring the technical abilities and skills needed to develop a business) knowledge (Alexander et al., 1991; Johannisson, 1991) in an educational setting. This is recognized as necessary in the entrepreneurial learning process of how to overcome traditional obstacles when organizing and managing new ventures (Aldrich & Zimmer, 1986; Shepherd, Douglas, & Shanley, 2000; Starr & Fondas, 1992; Stinchcombe, 1965), which builds on the discussion of the importance of prior knowledge and how it creates opportunities to recognize business ideas (Shane & Venkataraman, 2000).

2.2.2.2 Judgemental ability and decision making related to entrepreneurial action

This component of educational experience relates to the judgemental ability to cope with decision-making under uncertain conditions. It is associated with know-when (achieving the sharp intuition to act at the right moment) and know-why (developing the right attitudes and motivation for a startup) entrepreneurial knowledge (Johannisson, 1991). It is related to the students' ability to regulate acquired entrepreneurial knowledge and skills when engaging in the entrepreneurial process (Alexander et al., 1991). This means that students know when to act intuitively based on entrepreneurial experiences, and knowing why to make decisions on how to act under uncertain conditions (G. Hägg, 2017). This type of learning would prepare students to develop an ability to take initial decisions based on judgment when facing ambiguity and uncertainty in the new venture creation process (Knight, 1921; Politis, 2008; Sarasvathy, 2001). This competence should make it possible for student entrepreneurs to regulate acquired entrepreneurial knowledge and skills when engaging in the entrepreneurial process (G. Hägg, 2017).

2.2.2.3 Social-and networking abilities

Entrepreneurship scholars emphasize that entrepreneurs learn within a wider context, using their entrepreneurial network and social communities (e.g. customers, family, and peers) (Cope, 2005; Gibb, 1997; Hines & Thorpe, 1995; Mäkinen, 2002). Originally, all types of learning objectives, except know-who are explained on a more fundamental basis in educational science (Alexander, 1992). Johannisson (1991) also included the aspect of social- and networking abilities as important when educating student entrepreneurs. This

is known as know-who knowledge (fostering networks and contacts for entrepreneurial ventures) and involves developing social-and networking abilities (Gustav Hägg & Politis, 2015; Radu Lefebvre & Redien-Collot, 2013). A few entrepreneurial scholars propose that interaction with real-world actors and peer-learning could enhance students entrepreneurial learning process (G. Hägg, 2017; Kassean, Vanevenhoven, Liguori, & Winkel, 2015; Aadland & Haneberg, 2019). However, this is less explored in the literature (Aadland, 2019). Additionally, students in action-based entrepreneurship education are also presented to learn from each other when they are a part of a venturing community involved in new venture creation (Aadland & Haneberg, 2019). Additionally, learning from others in a team-based setting (Harms, 2015; S. Mueller & Anderson, 2014; Pittaway & Cope, 2007), develops collaborative abilities and commutative skills (Sharan, 2015; Topping, 2005).

2.2.3 Educational Experience and Entrepreneurial Passion

Entrepreneurial passion is considered to play an important role in entrepreneurship and the entrepreneurial process (Baum et al., 2001; Melissa S. Cardon et al., 2009; R. J. Vallerand et al., 2003). The construct has been positively related to several outcomes in the entrepreneurial process, e.g. (Drnovsek et al., 2016; Sæter et al., 2018). Despite the broader range of research on entrepreneurial passion over the past years, few studies investigate the effect entrepreneurial education has on entrepreneurial passion (Arshad et al., 2018). There are currently not many articles which relate the construct to entrepreneurship students and nascent entrepreneurs, and it is only a few scholars that suggest that passion may be increased or teachable through entrepreneurship education or other entrepreneurial experiences, e.g. (Gielnik, Spitzmuller, Schmitt, Klemann, & Frese, 2015; P. Stenholm & Nielsen, 2019; Pekka Stenholm et al., 2017). Although there is lacking research on entrepreneurial passion in this context, the literature highlights entrepreneurial passion as an important construct in the entrepreneurial process (Melissa S. Cardon et al., 2009). The few studies on this area indicate a connection between the entrepreneurial learning a student gain through participation in an entrepreneurship education program and the emerge of entrepreneurial passion, e.g. (Idris et al., 2018; Zainuddin et al., 2019). Scholars have also confirmed a positive relationship between entrepreneurial passion and both entrepreneurial experience, e.g. (P. Stenholm & Nielsen, 2019) and entrepreneurial learning process, e.g. (Dermol, 2010).

The literature asks for a deeper understanding of how entrepreneurial learning affects the development of a passion for entrepreneurship in an entrepreneurship education context (Zainuddin et al., 2019). This is aligned with the research on entrepreneurial passion requesting further studies on how passion develops (Murnieks et al., 2014). Therefore, the authors want to investigate how an educational entrepreneurship program is related to the development of entrepreneurial passion. This is done by investigating student's educational experience presented as a measurement of entrepreneurial competence (knowledge, skills, and abilities) gained in an entrepreneurship education (Gibb, 1993; Johannisson, 1991; Ronstadt, 1985). The components of educational experience, presented in section [2.2.2](#), are investigated in connection with the experienced entrepreneurial passion, using Cardon's (2009) established a definition presented in section [2.1.3](#). The authors, therefore, investigate the following hypothesis in this thesis:

Hypothesis 1a: Educational experience is positively related to a passion for inventing.

Hypothesis 1b: Educational experience is positively related to a passion for founding.

Hypothesis 1c: Educational experience is positively related to a passion for developing.

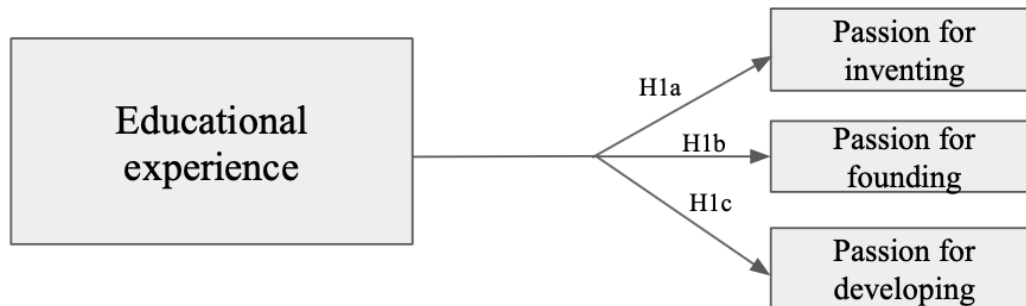


Figure 1 : Illustration of the relationship investigated between Educational Experience and the dimensions of Entrepreneurial Passion

2.3 Venture Creation Program

Entrepreneurship education has been thriving worldwide in the last decade (Alain Fayolle, 2013), which has resulted in a growing number of entrepreneurial education programs (Arpiainen & Tynjälä, 2017; Donnellon et al., 2014). Educational entrepreneurship programs can be organized in many ways and Samwel Mwasalwiba (2010) divides the different methods into "traditional methods" and "innovative methods". Traditionally, students have learned about entrepreneurship by the traditional ways of teaching with, e.g., lectures and seminars (Arpiainen & Tynjälä, 2017; Rasmussen & Sørheim, 2006). This way, the students learn the theory about entrepreneurship but do not explore the entrepreneurial process. Recently, there has arisen a debate in the literature whether these traditional ways of teaching are inadequate for teaching students to become entrepreneurs (Kassean et al., 2015; Neck & Greene, 2011; Rasmussen & Sørheim, 2006). In comprehending "how" entrepreneurs learn, there has been a shift towards a common recognition that entrepreneurs are action-oriented and much of their learning is experimentally based (Rae & Carswell, 2001). Consequently, more attention towards education which focuses less on traditional teaching and the use of experiential learning has increased (Fayolle & Gially, 2008; Pittaway & Cope, 2007; Solomon, Vincett, & Farlow, 2008), including more learning-by-doing activities (Rasmussen & Sørheim, 2006; Robinson, Neergaard, Tanggaard, & Krueger, 2016). These methods are categorized as innovative teaching methods and are denoted as action-based programs, where students learn different skills and mindset in order to become more entrepreneurial (Rasmussen & Sørheim, 2006). The interest in the field of action-based approaches in entrepreneurship education has resulted in the term venture creation program (Adams, 2016).

A venture creation program (referred to as VCP) is "an entrepreneurship education program which utilizes the on-going creation of a real-life venture as the primary learning

vessel" (M. Lackeus, 2015, p. 65). This term was developed "to allow the purposeful sampling of higher education programmes which have real-life venture as their primary learning vessel and thus part of the formal curriculum" (Lackeus, 2015, p. 17). VCPs facilitates students to experience the entrepreneurial process through real-life experiences by starting a real-life venture (Ollila & Williams-Middleton, 2011). The VCP emphasizes an experiential learning approach (Kolb, 1984), focusing on learning-by-doing in group settings and a network context (Burgoyne & Hodgson, 1983; Marsick & Watkins, 1990; Ollila & Williams-Middleton, 2011; Rasmussen & Sørheim, 2006). The concept is rare, and the majority of the VCPs are newly established (Adams, 2016; G. Hägg, 2017; Samwel Mwasalwiba, 2010). Due to systematics and cost-based challenges, action-based programs are more infrequent than traditional programs. Thus, it is important to understand the effect of such programs in order to ensure resources are used in an appropriate way (Lackeus, 2013). However, there is a growing trend of adopting this approach in entrepreneurial education (M. Lackeus, 2015; Lockyer & Adams, 2014). There are several ways of designing such a program (Aadland & Aaboen, 2018), but the aim is to allow the student to "test the water" and facing an entrepreneur's real-life experiences (Ollila & Williams-Middleton, 2011). The program is recognized as "an enabler in the transformation of students into being entrepreneurs" (M. Lackeus, 2015, p. 49). The students can explore entrepreneurial activities within a stable environment (Lockyer & Adams, 2014) and experience how to be an entrepreneur, instead of only learning about the topic (Aadland & Haneberg, 2019).

Gaining this type of entrepreneurial experience can be linked to the way entrepreneurs perceive new situations (Cope, 2005), and previous research has frequently pointed out the role of prior startup experience, as essential for entrepreneurial learning (Box et al., 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). Several scholars argue for those entrepreneurs involved in starting up a business also seem to be more effective and successful in starting up and managing their second and third organization (Lamont, 1972; Ronstadt, 1988; Starr & Fondas, 1992; Vesper, 1990; Wright et al., 1998).

2.3.1 Educational Experience and Entrepreneurial Passion in a Venture Creation Programs

The VCP facilitates students' to experience the entrepreneurial process through real-life experiences (Ollila & Williams-Middleton, 2011). An underlying objective of a VCP is to develop student's entrepreneurial competencies (knowledge, skills, and abilities) (M. Lackeus, 2015). With the shift towards more innovative teaching methods (Rasmussen & Sørheim, 2006), literature requests more research in the context of VCPs (Støren et al., 2015). Additionally, as mentioned in section [2.2.3](#), there is lacking research on entrepreneurial passion in an entrepreneurship education context (Arshad et al., 2018). Entrepreneurial passion is also little mentioned in a VCP context, e.g. (Sæter et al., 2018). The literature highlights entrepreneurial passion as an important construct in the entrepreneurial process (Melissa S. Cardon et al., 2009), which is the primary learning vessel in a VCP (M. Lackeus, 2015 and 2013). VCPs facilitate students' entrepreneurial learning process through entrepreneurial experiences (Kassean et al., 2015; Neck & Corbett, 2018; Neck & Greene, 2011; Pittaway & Cope, 2007; Rasmussen & Sørheim, 2006), aiming to increase their entrepreneurial competence in an entrepreneurial context. Therefore, the authors want to investigate if participation in a VCP moderates the relationship between the student's educational experience and entrepreneurial passion.

This is done by investigating VCP as a moderating effect on the relationship between the components of educational experience (see section 2.2.2) and entrepreneurial passion, using Cardon's (2009) dimensions of passion (see section 2.1.3). The authors, therefore, investigate the following hypothesis in this thesis:

Hypothesis 2a: The relationship between passion for inventing and educational experience is moderated by the attendance in a venture creation program.

Hypothesis 2b: The relationship between passion for founding and educational experience is moderated by the attendance in a venture creation program.

Hypothesis 2c: The relationship between passion for developing and educational experience is moderated by the attendance in a venture creation program.

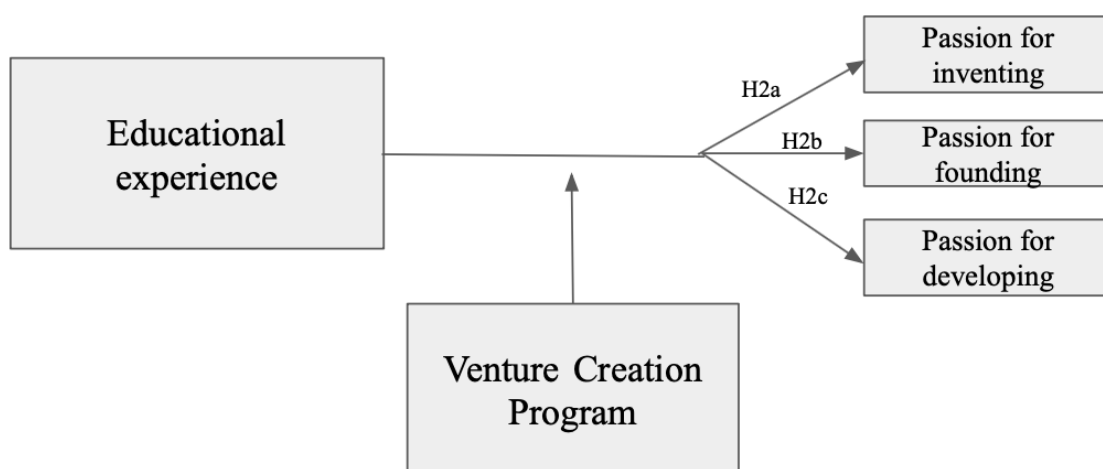


Figure 2: Illustration of the Venture Creation Program as a mediator on the relationship between Educational Experience and the dimensions of Entrepreneurial Passion.

2.3.2 Critical Learning Events in a Venture Creation Program

As mentioned in section 2.3, the learning environment in a VCP is built on Kolb's (1984) experiential learning theory. However, this theory has also received much criticism since it de-contextualizes and only accounts for limited factors influencing the entrepreneurial learning process (Kayes, 2002; M. Reynolds, 1998; Vince, 1998). In addition, to claim that students learn experientially through the new venture creation process, researchers have started to investigate in which situations student learn (Corbett, 2005). Reuber & Fischer (1993) argue that there is a need for a more deeply understanding on how entrepreneurs learn from formate experiences, through the identification of entrepreneurial learning "mechanisms" (Pittaway & Thorpe, 2012). Therefore, due to the lack of sufficient arguments when explaining how entrepreneurs learn, there has been a shift towards Cope's (2005) Dynamic Learning Perspective of entrepreneurship (Pittaway & Thorpe, 2012). In Cope's (2005) theory, he conceptualizes the dynamic nature of entrepreneurial learning and takes into account both the functional, personality-and behavioural perspectives of entrepreneurship.

Cope & Watts (2000) has pioneered research on and demonstrated how learning and adaptation are stimulated through distinct events, which are defined as "critical learning events". The literature shows growing evidence that significant "events" or "episodes" have an important role in the entrepreneurial learning process (Deakins & Freel, 1998; Pittaway & Thorpe, 2012; Rae & Carswell, 2001). These are situations that entrepreneurs experience as influential, effective, and meaningful for their learning process in retrospect (Cope, 2003; Cope, 2005). These "critical learning events" may, therefore, be looked at as important for the obtained entrepreneurial experience (Cope, 2005), and Cope (2003) state that these events have "*a prominent role to play in how entrepreneurs learn*" (Cope, 2003, p.436). The term critical refers to that the circumstances described in the event play an important role in their learning. Cope was the pioneer in the research on the notion of such "critical learning events", which has become an emerging theme within the literature of entrepreneurial learning (Cope, 2000; Deakins & Freel, 1998).

However, these events are somewhat "metaphorical" (Cope, 2005, p. 383) and little researched, resulting in a few concrete definitions of such events. Moreover, Lackeus' (2014) work has been capable of empirically confirming some aspects of Cope's framework for entrepreneurial learning, stating that critical learning events are central to how people become entrepreneurial (Pittaway & Thorpe, 2012). Lackeus (2014) investigates "critical learning events" in relation to entrepreneurial competence, and refers to action-based learning environments, as a VCP, as particularly suitable for studying such emotional aspects of entrepreneurial education. In order to define such events in a VCP, he draws upon Cope (2003 and 2005) statement, highlighting the importance of emotions in such events, and therefore builds upon Arpiainen et al. (2013) work. Arpiainen et al. (2013) presents three sources of emotions, including several events that lead to strong emotions during the students' entrepreneurial learning process in a learning-by-doing educational setting. Other researchers support this view, empirically showing that emotional exposure created through group dynamics played a significant role in effective student learning, e.g. (Pittaway & Cope, 2007). The events Lackeus (2014) adapts from Cope (2005) and Arpiainen et al. (2013, p. 336-340) to define critical learning events in a VCP is presented in Table 1.

Table 1: Arpiainen et al. (2013, p. 336-340) three sources of emotions including events during student's entrepreneurial learning process, adapted by Lackeus (2014) in order to concretize critical learning events in a venture creation program.

New kind of learning environment	
Event	Description
Uncertainty and confusion	E.g. face new situations, solve new problems, and handle confusion and stress.
Theory versus practice	Find a balance between theory and practice, seeking the relevant information by themselves
Support from the outside world	Support from "outside" the program, e.g. from the management and co-lecturers.
Collaborative teamwork environment	
Teamwork	Including team pressure and team support.
Time management	E.g. constant lack of time, which can be stressful, but also helps to keep students up with the study-related tasks.
Individual difference	E.g. different socio-cultural backgrounds, previous knowledge, and learning
Challenging tasks	
Overcoming knowledge and skill gaps	Due to lack of previous knowledge and experience.
Interacting with the outside world	E.g. talking to potential customers and stakeholders outside the program
Leadership and managing people	E.g. leadership issues as handling conflicts.

This thesis built upon Lackeus (2014) concretization of critical learning events, in order to investigate how critical learning events is related to entrepreneurial passion in entrepreneurship education. With the basis of Cope's (2003) critical learning events and the results of Arpiainen et al. (2013) research, Lackeus (2014) did find a link between the critical learning events – "interaction with the outside world" and "teamwork experience" with entrepreneurial passion in a VCP. However, since entrepreneurial passion was not of primary interest in Lackeus (2014) work, the authors want to investigate this link further in the qualitative part of the thesis.

3 Methodology

This chapter presents the mixed method methodology applied in this thesis, consisting of a quantitative and qualitative method, presented respectively. The research design of the thesis is presented in the first part, followed by the sample and context for the thesis. In order to investigate the relationship between “Educational experience” and “Entrepreneurial passion”, and how a “Venture creation program” moderate this relationship, the authors conducted a quantitative analysis presented in section [3.3](#). In order to further investigate how the educational experience in a VCP is related to entrepreneurial passion, and how critical learning events might be related to entrepreneurial passion in such program, the authors conducted qualitative interviews of the sample, presented in section [3.4](#). Lastly, a summary and reflection of the method are presented.

3.1 Research design

This thesis applies a mixed method approach, combining both quantitative and qualitative research methods (Creswell & Clark, 2007). Conducting a mixed method provides a richer perspective of how the educational experience in a VCP is related to entrepreneurial passion. This is because quantitative and qualitative research methods have different purposes and advantages (Arora & Stoner, 2009). A quantitative approach, using an existing cross-sectional study, was applied in order to investigate the relationship between educational experience and entrepreneurial passion (Ringdal, 2014). The quantitative data provide a quantifiable reality of this relationship, measured from a large sample of respondents (Creswell & Clark, 2007). Therefore, result from the quantitative analysis was used as a basis when conducting the qualitative case-study, with in-depth interviews for data acquisition, where the purpose is leading to the choice of method (Krumsvik, 2013). Because the authors want to answer more in-depth about how educational experience is related to entrepreneurial passion, and further how critical learning events are related to entrepreneurial passion in a VCP, a qualitative case study is chosen as a research design (YIN, 2014). The goal of this qualitative research is for example to capture realities from the perspectives of the informants, by aiming to select informants that can provide rich information about their experience in the VCP (Creswell & Clark, 2007). The authors chose a multiple case study in order to get an in-depth understanding of entrepreneurial passion in a VCP from the individuals perspective (EISENHARDT & GRAEBNER, 2007).

There exist several ways of combining quantitative and qualitative methods in research (Tashakkori & Teddlie, 2010). The thesis focuses on two phases sequential, starting with a quantitative approach before continuing with a qualitative approach. With the use of both qualitative and quantitative methods, the authors can take advantage of the strengths of both methods, including representativeness (quantitative) and depth (qualitative) (Creswell & Clark, 2007). The mixed method applied in this thesis uses an explanatory sequential design, where the results from the quantitative analysis were used as a basis for the qualitative research (Creswell & Clark, 2007). Since the data acquisition of the quantitative phase was already conducted, the authors were responsible for the data analysis and interpretation (illustrated in Figure 3).

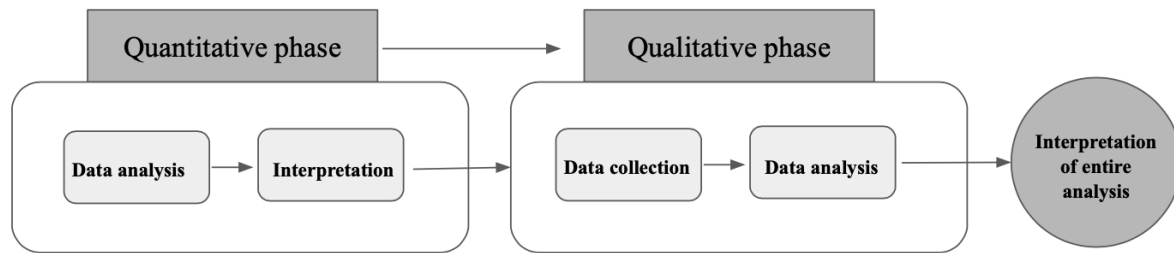


Figure 3: Model of sequential explanatory mixed methods design.

3.2 Sample and context

Entrepreneurship has expanded out of business schools and into many other university departments worldwide since entrepreneurial competencies have been accepted to be suitable for many disciplines (Aadland, 2019). Currently, there is an ongoing research project between three universities offering a VCP – Norwegian University of Technology (NTNU) and Science, Lund University, and Chalmers University. This project seeks to study how a VCP prepares students for entrepreneurship. Accordingly, a social survey was sent out to graduates, in slightly different variants, from each VCP. The VCP at NTNU, NTNU School of Entrepreneurship, was the only one sending out this survey to students that applied for and were interviewed for the program but did not get accepted. This enables investigation of differences between the two groups (discussed in section 3.2.2) and is one of the reasons why the VCP at NTNU is chosen for this study. In addition, the VCP was picked because it fulfils the criterias of a VCP by adopting a learning-by-doing approach, where the students establish a new venture during their study at the program (M. Lackéus, 2015). This VCP is presented in the next section.

3.2.1 NTNU School of Entrepreneurship

In (NIFU, 2015) awarded NTNU School of Entrepreneurship (NSE) as one of the leading environments for action-based entrepreneurship education programs in Norway (D. H. Haneberg, Brandshaug, & Aadland, 2018). The VCP is a two-year 120 ECST master program facilitating a venture creation approach at Norwegian University of Science and Technology, where the venture creation is the primary learning vessel (M. Lackéus, 2015). The students establish and develop a startup, in addition to, a full academic workload focused on business development (Warhuus & Basaiawmoit, 2014). This reinforces a unique combination of theory and practice as an educational model, offering students the possibility to develop entrepreneurial skills in a real-life context.

The students are interdisciplinary with various backgrounds of study disciplines, like engineering and technology, economic and management, social science, medicine-, health- and natural science. Each cohort contain approximately 35 students (Aadland & Haneberg, 2019). According to the faculty at NSE, the students are selected on the basis, among other criteria, their tendency of showing entrepreneurial passion. The first semester contains a course involving feasibility studies, which forms the fundament of the business idea for the students' ventures. The startups are developed throughout the remaining three semesters, in teams usually consisting of two to five NSE-students (D. H. Haneberg et al., 2018). On average, fifty percent of the students start in their own venture

after graduating (Aadland & Haneberg, 2019). An overview of the structure of the program is adopted from (Kaloudis et al., 2019) and presented in Figure 4..

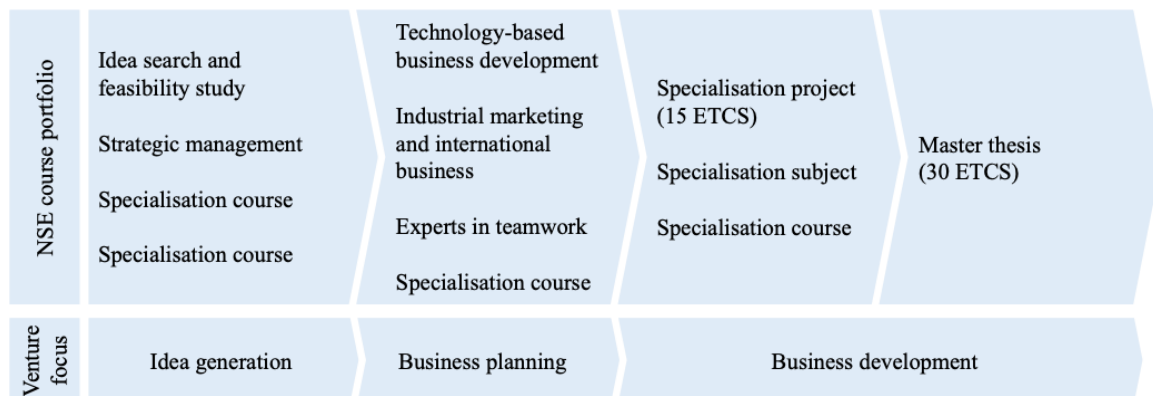


Figure 4: NTNU School of Entrepreneurship (NSE) program design with courses and business focus. All courses are 7.5 ECTS unless stated otherwise, with the specialization courses selected by the students based on their prior study background (Kaloudis et al., 2019)

3.2.2 Quantitative data acquisition

The study sample in the quantitative research is graduates that participated in, and students that applied for and were interviewed for NSE. As presented, a social survey was sent to the sample by NSE in 2018. The social survey is one of the main methods in order to collect data from a large number of people (Bryman, 1992). It makes it possible to investigate similarities and differences in the respondent's answers, so generalization of the results to the whole population can be adapted (Johannessen, Tufte, & Christoffersen, 2010). Several studies have asked for the use of a control group in future research on the effect of entrepreneurship education (De Clercq, Honig, & Martin, 2013; Rauch & Hulsink, 2015). Only some were selected to the program, and some were not, which allows for having a treatment and control group (Nardi, 2014). This thesis refers to candidates who attend the VCP as the treatment group (hereafter referred to as participants), and those who did not as a control group (hereafter referred to as non-participants). The students interviewed for the program are assumed to have high motivation for participation since all candidates needed to write a motivational letter in advance. Therefore, the only difference between the two groups is assumed to be who got selected into the program (Martin, McNally, & Kay, 2013).

The survey was answered in retrospect, by individuals who graduated from 2004 to 2018, both participants and non-participants. The data contains information on several relevant topics of entrepreneurship education. However, the authors only used the data relevant for this thesis – the topics of entrepreneurial passion and education experience (see [attachment 3](#)). A control group improves the ability of the authors to make accurate claims of the relationship between educational experience in a VCP and entrepreneurial passion (Martin et al., 2013). In total, 452 answers were conducted. 97 answers were void, resulting in 354 valid answers. This data consisted of 154 answers from participants and 200 answers from non-participants (also presented in section [4.1](#)).

3.2.3 Qualitative data acquisition

In the qualitative research, the sample is narrowed down to graduates participated in NSE. The qualitative data acquisition is an extension of the quantitative results (Creswell & Clark, 2007). In the qualitative research, the authors conducted in-depth interviews (see section 3.4.1) of six (6) different graduates from NSE, graduating between 2014 and 2019. Accounting for the importance of prior entrepreneurial experience (see section 2.2.1) and the results of the quantitative analysis, the informants were split into two groups - participants with prior startup experience and participants without startup experience prior to NSE. An equal number of informants for each gender was selected, as gender may influence the effect on the graduate's educational experience and startup-activity (Fjærli, Iancu, & Raknerud, 2013; Johansen, 2013). An overview of the informants is presented in Table 2 below.

Table 2: Presenting an overview of the informants.

Participants with previous startup experience			Participants without previous startup experience		
Informant 3 (Female) Graduate Year 2018	Informant 5 (Male) Graduate Year 2019	Informant 6 (Male) Graduate Year 2014	Informant 1 (Female) Graduate Year 2015	Informant 2 (Female) Graduate Year 2017	Informant 4 (Male) Graduate Year 2019

The purpose of the interviews was to gain more in-depth insight into how the VCP is related to the relationship between educational experience and entrepreneurial passion. The quantitative analysis lays a basis for the qualitative analysis, and therefore the authors continue with the same VCP as the sample in the quantitative analysis (presented in section 3.2.2). In addition to fulfilling the criteria of a VCP (M. Lackeus, 2015), the authors' prior relation to the program and the availability had an impact on the choice. The informants were identified and chosen based on information provided by the school's homepage. The informants got information about purpose and project plan of the thesis beforehand and that it was voluntarily and could withdraw at any time (Kvale, 2006). Due to COVID-19, and regulation set by the government, the interviews were held through the video conference program Zoom. To avoid the informants being recognized, due to sensitive subjects brought up in the interview (Tjora, 2010), the informants are anonymous.

3.3 Quantitative method

The purpose of the quantitative method was to investigate the relationship between "Educational Experience" and "Entrepreneurial Passion", and how a "Venture Creation Program" is related to this relationship. As a part of the mixed method, the authors first conducted a quantitative analysis. The measures used and how the data analysis conducted is presented in the next sections.

3.3.1 Measures

The variables presented below are selected to measure the concepts and characteristics of the sample from a theoretical perspective (Ringdal, 2014).

3.3.1.1 Entrepreneurial passion

Entrepreneurial passion is the dependent variable, which is the phenomenon this thesis aim to investigate (Nardi, 2014). To measure this construct, the existing survey used a scale developed by Melissa S. Cardon et al. (2013), which is specially made in order to measure an entrepreneur's experience of passion. The measurement model is based on Melissa S. Cardon et al. (2009) Conceptual Viewpoint, categorizing passion into different dimensions (inventing, founding and developing) based on which part of the entrepreneurial process an entrepreneur experience "Intense positive feelings" and "Identity centrality" towards (see section [2.1](#)). These items were reported on a 7-point Likert scale from 1=strongly disagree to 7= strongly agree (M. S. Cardon & Kirk, 2015). The authors have formed separate variables for each dimension of entrepreneurial passion (Melissa S. Cardon et al., 2013), in order to be consistent with theory (Melissa S. Cardon et al., 2009) presented in section [2.1.3](#). In the existing survey, each dimension of passion consisted of items measuring "Intense positive feelings" and an item measuring the "Identity centrality" towards the corresponding dimension (Melissa S. Cardon et al., 2013). A single variable for "Intense positive feelings" was formed by a weighted average of the items. A score for the corresponding dimension of passion was formed by multiplication of the score between "Intense positive feelings" and "Identity centrality", as described by (Melissa S. Cardon et al., 2013).

3.3.1.2 Educational Experience

When measuring the entrepreneurial competence gained in entrepreneurial education, the theory from Johannisson (1991) and G. Hägg (2017) is used, as presented in section [2.2.3](#). Educational experience is separated into three distinct categories; "Knowledge and skills related to the entrepreneurial process" (hereafter Knowledge and skills), "Judgemental ability and decision making related to entrepreneurial action" (hereafter Judgemental ability and decision making) and "Social- and networking abilities" in the existing survey. Each category consists of several items, which were also reported on a 7-point Likert scale.

However, based on exploratory factor analysis presented in section [3.3.2.1](#) the category "Social- and networking abilities" were separated into two different variables, where one measuring the team aspect (hereafter called Teamwork abilities) and the other one measuring the social-and networking aspect of the learning component (hereafter called Social- and networking abilities) related to know-who knowledge presented in section [2.2.2.3](#). The items for each component were averaged to form a single measure of each category. Summarized, "Educational experience" is therefore separated into four variables: "Knowledge and skills", "Judgemental ability and decision making", "Social- and networking abilities" and "Teamwork abilities". These components are the independent variables (Nardi, 2014).

3.3.1.3 Venture Creation Program

The survey registered if the respondents attended a VCP, measured by a dummy variable "Venture creation program", with value one for participants and zero for non-participants in such programs.

3.3.1.4 Control variables

The control variables are assumed to be related to entrepreneurial passion. These are included in the regression, being constant, in order to ensure that an observed relationship between educational experience and entrepreneurial passion is present (Hair, Black, Babin, & Anderson, 2013; Midtbø, 2012). The control variables derived from the survey and used in the analysis is presented below. These variables are chosen based on statistics provided by Fjærli et al. (2013) on factors influencing an entrepreneurs' activity in Norway.

Gender. This variable measures if the respondents is a female or male, represented by a dummy variable with value one for females and zero for males.

Education Background. This variable measures the respondents' educational background when applying for enrollment in NSE. This variable is coded into three educational disciplines, "Business", "Social Science" and "STEM – Science, Technology, Engineering and Maths". The regression models presented in section [4.1.1](#) (Table 12, Table 13 and Table 14) and section [4.1.2](#) (Table 15, Table 16 and Table 17) use the educational background "Business" as reference. This means that the coefficients associated with the educational background "Social Science" or "STEM" are compared to subjects which have "Business" as educational background.

Graduate year. The survey was sent out in 2018. This variable is measured as the number of years since the subject's graduation from their educational program.

Status. This variable measures the respondents family situation when answering the survey, and is coded into three relationship statuses: "Single", "Partner", or "Married" when answering the survey. The regression models presented in section [4.1.1](#) (Table 12, Table 13 and Table 14) and section [4.1.2](#) (Table 15, Table 16 and Table 17) use the status "Single" as reference. This means that the coefficients associated with status "Partner" or "Married" are compared to subjects which have "Single" as status.

Children. This variable measures if the respondents have a child or not when answering the survey, represented by a dummy variable with one for respondents having a child and zero for respondents with no children.

Parents with higher education. This variable measures if the respondents have at least one parent with a higher education, represented by one for parents with higher education and zero for not having parents with higher education. Higher education is defined as at least having a bachelor's degree.

Grades above average. This variable measures if the respondents have grades above average in higher education in general, represented by a dummy variable with value one for grades above average and zero for grades equal to or below average.

Entrepreneurs in family or friends. This variable measures if the respondents have any parents, siblings, grandparents, or friends who have started a business, represented by a dummy variable with one having an entrepreneur in family or friends and zero if not.

In addition to the mentioned control variables, «Age When Applying» was also included in the analysis. This variable measured the age of the respondents when applying for the venture creation program. However, the authors decided to discard this control variable

since the variable contained fewer observations, approximately 100 fewer observations compared to the other control variables included in the analysis. This variable should be included in further studies.

3.3.2 Data analysis

This section presents the conducted exploratory factor analysis and testing of statistical assumptions on the data before applying regression models. Additionally, the regression models applied are proposed.

3.3.2.1 Exploratory Factor Analysis

Exploratory factor analysis is conducted to examine the existing relationship between items and factors, by identifying inappropriate items and the dimensionality of the construct (Netemeyer, Bearden, & Sharma, 2003). Since the component "Identity centrality" of entrepreneurial passion was measured by one item, a factor analysis was not necessary. A factor analysis with varimax rotation was carried out on all the items in the survey measuring the "Intense positive feelings" for the different dimensions of entrepreneurial passion. A factor analysis with varimax rotation was also carried out on the items within the topic of educational experience in the survey. In order to ensure that the items composing the factors were closely related to the factor analysis, Cronbach's Alpha test was applied (Ringdal, 2014). Cronbach's Alpha test measures the degree of internal consistency between the factors included in the composite variables (Ringdal, 2014).

Consistent with theory (Melissa S. Cardon et al., 2009), the factor analysis on the items associated with Entrepreneurial Passion, loaded on three factors representing the intense positive feelings for inventing, founding and developing (see [attachment 4](#)). Every item was retained since they had loadings greater than .50, which is recommended (Ringdal, 2014). Additionally, Cronbach's Alpha test was applied to the variables. It resulted in Cronbach's alpha= 0.8662 for intense positive feelings for passion for inventing, Cronbach's alpha= 0.8927 for intense positive feelings for passion for founding and Cronbach's alpha = 0.8263 for intense positive feelings for passion for developing (see [attachment 6](#)). According to (Ringdal, 2014) the requirement is that this value must be above 0.5, which is fulfilled for these variables.

The factor analysis on the items associated with educational experience resulted in one out of 15 items in the survey was removed, due to high cross-loadings with other factors. The removed item measured the subject's satisfaction with the educational program. All remaining items had loadings greater than .50 and were retained (Ringdal, 2014). This factor analysis proposed four different components of educational experience. Two of the components were "Knowledge and skills" (Cronbach's alpha=0.9332) and "Judgemental ability and decision making" (Cronbach's alpha= 0.8643) (see [attachment 6](#)). The last component "Social skills and networking abilities" were divided into two components, based on the factor loadings (see [attachment 5](#)). This indicates that the original component should have been divided into separate variables (Ringdal, 2014), and based on the corresponding items from the survey it seems like the original component embodies two separate themes within educational experience. Therefore, the authors divide this component into separate variables, denoted as "Social- and networking abilities"

(Cronbach's alpha= 0.8863) and "Teamwork abilities" (Cronbach's alpha= 0.7688) (see [attachment 6](#)). "Social- and networking abilities" captures the social skills and networking abilities related to the entrepreneurial process, whereas "Teamwork abilities" captures the ability to work and handle challenges in a team process. As before, the authors considered (Ringdal, 2014) requirement of a Cronbach alpha value above 0.5, which is fulfilled for these variables.

3.3.2.2 Statistical assumptions

Before applying a multivariate regression model, some statistical assumptions should be tested in order to trust the results from the model. If the data satisfy these requirements, then the estimator is unbiased (average of the estimates in repeated measurements is identical to the population parameter) and accurate (smallest possible variance) (Midtbø, 2012). Violation can lead to misleading coefficients and misleading tests of significance. First, the error terms (hereafter residuals) should typically be distributed in order to make valid inferences from the regression models (Midtbø, 2012). This is tested with a q-q plot to verify that the residuals are symmetric so that the probability of under- and overestimating a value is the same (Midtbø, 2012). Since the residuals in the q-q plot were mostly present on a 45-degree line, it implies that the residuals are normally distributed, and that data satisfies the assumption (Midtbø, 2012). This is also verified by a Skewness and kurtosis test for normality, testing whether the residuals are symmetric (Midtbø, 2012). This was verified since the statistical test was not rejected on a 0.05 significance level.

Moreover, to ensure valid statistical tests, the amount of error should be consistent across the full range of the observed data. The residuals should show a homoscedasticity tendency, that the variance of the residuals should be independent of the educational experience components. This is tested graphically plotting the residuals against the predicted values of entrepreneurial passion, for each independent variable of the educational experience. Since the graphical plots did not show a clear tendency, i.e. the residuals seem randomly spread, this assumption is satisfied (Midtbø, 2012). The statistical test, Breusch-Pagan test can also test this. Since the statistical test is not rejected on a 0.05 significance level, it implies that the error variance is not heteroscedastic enough to cause problems (Midtbø, 2012). In order to ensure that coefficients in the regression model are reliable, the dataset is also tested for outliers. This is tested by plotting the leverage against the squared residuals, by a `lvr2plot` (Midtbø, 2012). Outliers in the dataset were tested, and since the data observations do not appear too far from each other, all data points are included in the analysis.

Further on, the residuals should be independent and should not show a tendency of internal correlation. Consequently, this can lead to low standard errors and too optimistic tests of significance (Midtbø, 2012). This is done by estimating the intraclass correlation coefficient, which measures how much of the total variation the variation between the groups consists of from a scale from 0 to 1 (Midtbø, 2012). This is satisfied since the intra correlation coefficient was not too high. Lastly, the regression needs to ensure the absence of multicollinearity, that the independent variables should not be too highly correlated with each other (Thrane, 2017). A too high correlation between the independent variables can cause difficulties in estimating the size of the individual coefficients, and small changes in the model can lead to big changes in the results (Midtbø, 2012). This is measured by investigating the VIF (Variance Inflation Factor) score between the independent variables.

Since the VIF scores between the components of educational experience were less than 10, none of the variables was discarded (Midtbø, 2012).

3.3.2.3 Regression analysis

After the data is tested for the appropriate statistical assumptions, a multivariate regression can be applied. In a quantitative method, the intention is to apply statistical analysis on a representative collection of data (Ringdal, 2014). To test the relationship in hypotheses 1a, 1b, and 1c (see section [2.2.3](#)), a multiple regression analysis is appropriate since the investigation look at the relationship between a single dependent variable (entrepreneurial passion) and several independent variables (a component of educational experience and control variables) (de Vaus, 1991). Hypothesis 2a, 2b and 2c (see section [2.3.1](#)) were tested using (Fairchild & MacKinnon, 2009) general model of testing moderation effects by applying multiple regression analysis with interaction terms. This is appropriate in order to test if participation in a venture creation program moderates the relationship between educational experience and entrepreneurial passion confirmed in hypothesis 1a, 1b, and 1c. Moderate effects can include enhancing, reducing, or changing the influence of educational experience on entrepreneurial passion (Fairchild & MacKinnon, 2009). This effect is tested looking at the interaction term between the components of educational experience and venture creation program, where the coefficient estimate in the regression provides an estimate of the moderation effect of such program (Fairchild & MacKinnon, 2009). If this coefficient is statistically significant, the model reveals that the venture creation program has a significant moderation on the relationship.

3.4 Qualitative method

The purpose of the quantitative analysis was to investigate the relationship between “Educational experience” and “Entrepreneurial passion”, and how a “Venture creation program” moderate this relationship. As a part of a mixed method, the authors also applied a qualitative method in order to investigate further in-depth how the educational experience in a VCP is related to entrepreneurial passion, and how critical learning events may be related to entrepreneurial passion in such program. The qualitative method consists of in-depth interviews presented in the next section.

3.4.1 *In-depth interviews*

In the qualitative research, the authors conducted in-depth interviews of six (6) different graduates from NSE, graduating between 2014 and 2019. The interviews were held through the video conference program Zoom and lasted between 40 to 60 minutes each. An interview guide (see [attachment 2](#)) was formed to the in-depth interviews in order to structure the interviews and categorizing the different themes (Dalen, 2013; Tjora, 2010) related to the theoretical framework presented in Table 3, Table 4 and Table 5. In order to conduct these interviews, an application, including the interview guide, was sent to NSD – Norwegian Centre for Research Data. NSD has reviewed the use of personal data in this project to comply with the privacy regulations (see [attachment 1](#)). Due to this, information derived from the qualitative interviews which reveal personal information, e.g. name, has been anonymized. Any other information possible of identifying the informants, like name and details of the startup, is also anonymized.

The first part of the guide (see [attachment 2](#)) contains background information and previous entrepreneurship activities, in order to get a short initiation of who the informant is (Widerberg & Bolstad, 2001). This calms the informant and builds trust between the informant and the authors (Thaagard, 2002). Further, the authors introduce the themes relevant for this study, each at the time, as presented in the interview guide (see [attachment 2](#)). The interview guide is designed based on the theory presented in chapter 2. The first part of the guide propose questions related to entrepreneurial learning gained in the VCP. This part also includes questions trying to capture critical learning events experienced during the informants' participation in the VCP. The second part proposes questions relation to entrepreneurial passion. These sections introduced open questions facilitating reflection and input from the informants' experiences (Thaagard, 2002). The author included a finishing section opening up for the informants to talk about other themes related to the topic, which maintain the flexibility of the interviews. However, the authors maintain a form of a structure by guiding reflection within each of the different themes (Thaagard, 2002).

3.4.2 Thematic data analysis

The data analysis of the collected data aims to connect the data to the purpose investigated (Tjora, 2010). The authors followed Braun & Clarke (2006) six-stage guide for thematic analysis. There are various approaches, but the six-stage thematic analysis is an adequate approach to analyse the data when having a large amount of data. It is an accessible and theoretically-flexible approach for analysing qualitative data, used for identifying, analysing, and reporting patterns (themes) within the data (Braun & Clarke, 2006). To provide a detailed description of the data set the authors transcribed each interview in detail based on an approved tape recording of the interview, which is the first stage of the thematic analysis. This is needed to conduct the complex and detailed analysis (Braun & Clarke, 2006). Transcription can avoid losing useful information and incorporates moments such as breaks where informants find it challenging to put into words, which may be relevant in the analysis. The interviews were conducted on the informants' mother tongue, the quotes in this thesis are therefore translated to English, maintaining the informants' anonymity (Tjora, 2010). Further in this stage, the authors read through the transcribed data, looking for possible meanings and connections (Braun & Clarke, 2006).

3.4.2.1 Coding of qualitative data

As the second step of the thematic analysis, the authors marked possible themes and connections with comments in different colours for each theme, which formed the first initial codes. When coding the qualitative data, the authors used excel in order to organize the data. These initial codes should be broad, marking basic segments and raw information (Braun & Clarke, 2006). In this study, an initial code was for example "learning from others", indicating broad information where the informant talks about how the informant learned from others. For the third step, the data should be organized and coded based on set themes (Braun & Clarke, 2006). Themes or patterns within data can be identified in two primary ways in thematic analysis, inductive or deductive. In this study, the authors conducted a deductive or theoretical approach, meaning that the themes are formed based on existing theory. Based on the purpose of the qualitative method, theory from entrepreneurial passion, educational experience, and critical learning events was incorporated into separate coding frameworks. Entrepreneurial passion, educational

experience, and critical learning events each contain different themes with respective coding frameworks (see Table 3, Table 4 and Table 5). Each theme usually has sub-themes which is more specific, making it easier for the author to place the different codes (Braun & Clarke, 2006). The coding frameworks are presented in Table 3, Table 4 and Table 5 below, in addition to the author's interpretation when coding the data.

Table 3: Coding framework for Entrepreneurial Passion.

Themes	Sub-themes used for coding	Authors' interpretation when coding data
Definition of entrepreneurial passion	Intense positive feelings	Intense positive feelings for an activity that people find important.
	Identity centrality	Intense positive feelings are experienced towards activities that are important and meaningful to an entrepreneur's self-identity.
Adapted from R. J. Vallerand et al. (2003) and Melissa S. Cardon et al. (2009)		
Dimensions of passion	Passion for inventing	Searching for problems/needs in the market. Creating new solutions and prototyping.
	Passion for founding	Birthing firms. Assembling the necessary financial, human and social resources.
	Passion for developing	Growth and expansion after the founding. Daily operations.
Adapted from Melissa S. Cardon et al. (2009)		

Table 4: Coding framework for Educational Experience.

Theme used for coding	Authors' interpretation when coding data
Knowledge and skills	Know-what (attaining the knowledge base and information for new venture development). Know-how (acquiring the technical abilities and skills needed to develop a business).
Judgemental ability and decision making	Know-when (achieving the sharp intuition to act at the correct moment). Know-why (developing the right attitudes and motivation for a startup).
Social- and networking abilities	Know-who (fostering networks and contacts for entrepreneurial ventures) – Social- and networking abilities related to an entrepreneurial process.
Teamwork abilities	Know-who (fostering networks and contacts for entrepreneurial ventures) – Abilities to work in a team and handle challenges in a team process.
Adapted from Johannisson (1991) and G. Hägg (2017)	

Table 5: Coding framework for Critical Learning Events in entrepreneurship education.

Themes	Sub-themes used for coding
New kind of learning environment	Uncertainty and confusion
	Theory versus practice
	Support from outside of the learning environment
Collaborative learning	Teamwork experience
	Time pressure
	Individual differences between the students
Challenging tasks	Overcoming knowledge and skill gaps
	Interacting with the outside world
	Leadership and managing people
Adapted from Lackeus (2013)	

The fourth step is to place the codes within the different themes and sub-themes, and Braun & Clarke (2006) suggests that the data should be systematically organised. Therefore, the authors formed a custom template presented in Table 6. When placing codes, the authors looked for quotes of data (hereafter referred to as strings of data) that matched the themes set in the coding frameworks (see Table 3, Table 4 and Table 5). Table 6 shows an example of how this was done. For example, the authors found the string of data when reading through the transcribed interview of informant 4. The authors analysed this string of data based on theory in connection to the themes and sub-themes, before placing it under the corresponding sub-theme.

Table 6: Template placing codes in relation to the themes and sub-themes.

Theme	Sub-theme	Informant 1	Informant 2	Informant 3	Informant 4	Informant 5	Informant 6
Entrepreneurial passion	Passion for inventing				My daily life when studying at NSE consisted of mapping customers needs and prototype ideas we wanted to present to the market. It was the most engaging part!		

As suggested by Braun & Clarke (2006), there was also made a theme called "Codes that do not fit in", housing codes that did not fit in under any of the themes from the coding frameworks.

For the qualitative part of this study, the authors wanted to investigate more in-depth how educational experience is related to entrepreneurial passion in a VCP, and how critical learning events are related to entrepreneurial passion in a VCP. For the next part of step four in the thematic analysis, the authors, therefore, formed an extension of the custom template presented in Table 6. The template presented in Table 7, presents how links were uncovered between the themes (entrepreneurial passion, educational experience, and critical learning events), through their respective sub-themes. In this example, the sub-theme "Passion for inventing" from the theme "Entrepreneurial passion" was linked to the sub-theme "Interaction with the outside world" from the theme "Critical learning event" in the quote presented by Informant 4. The links are made when a quote from the data (a string of data) include more than one theme or sub-theme.

Table 7: Template placing codes link different themes and sub-themes.

Themes		Informant 1	Informant 2	Informant 3	Informant 4	Informant 5	Informant 6
Entrepreneurial passion	Critical learning events				"Passion for inventing" and "Interacting with the outside world" When I work on the development of solutions based on obtained user insight, i actually find it very engaging		

When the transcription is read, and the codes are placed based on the coding frameworks (see Table 3, Table 4 and Table 5). As step five, the authors read through the data placed in the different themes, making sure the codes still are in relation to the theme, and there is an overall context (Braun & Clarke, 2006). If the codes in the theme "Codes that do not fit in" still not have a suitable place within the codes from the coding frameworks, they should be cut because they most likely do not fit under the overall context (Braun & Clarke, 2006). However, in this study, a large amount of data ended up in the "Codes that do not fit in", the main essence of these codes will, therefore, be presented in section [4.2.4](#) and further discussed in section [5.4](#).

According to Braun & Clarke (2006), the last step of the six-stage thematic analysis is to present the qualitative findings, which is done in section [4.2](#). When presenting the finding, the authors used two templates (see Table 8 and Table 9) to present the uncovered occurrences and links. When forming these templates, the authors drew inspiration from the grounded theory presented by Strauss & Corbin (1997). The authors used the template in Table 8 to present the uncovered occurrences of data for each group related to the different themes. An occurrence is a string of data, including quotes which can be related to theory from a theme or sub-theme. The table presents the number of occurrences for each group (see Table 2) and in total. The main findings from the analysis will be highlighted with a grey shade in the template, where a darker shade indicates a higher number of occurrences.

Table 8: Template for analysis of number of occurrences uncovered of each theme.

Codes		Participants with previous startup experience	Participants without previous startup experience	Total number of occurrences
Theme	Sub-theme			

Further, when presenting the links uncovered, a separate template is used. This template is presented below in Table 9 illustrating how each sub-theme of the themes (in this illustration the theme “Entrepreneurial passion”, with following sub-theme “Passion for inventing”, and the theme “Critical learning events”, with the following sub-theme “Interaction with the outside world”) is linked. The table presents the number of occurred links for each group and in total. The main findings from the analysis will be highlighted with a grey shade in the template.

Table 9: Template for analysis of linkages that occurred between themes, linked through each themes’ sub-themes.

Coding based linkages in interviews		Participants with previous startup experience	Participants without previous startup experience	Number of occurrences in total
Entrepreneurial passion	Critical learning events			
Passion for inventing	Interaction with the outside world			

3.5 Summary of Mixed Method

This thesis applies a mixed method approach with explanatory sequential design (Creswell & Clark, 2007), combining a quantitative cross-sectional study and a qualitative case study. The purpose of quantitative analysis is to investigate the relationship between “Educational experience” and “Entrepreneurial passion”, and test whether participation in a “Venture creation program” moderate this relationship. The results of the quantitative analysis form the purpose of the qualitative analysis, trying to capture in-depth data on how educational experience in a VCP is related to entrepreneurial passion, and further how critical learning events in such programs is related to entrepreneurial passion.

Table 10 presents a summary of the two methodological approaches. Followed is a reflection of each approach, including validity and reliability which is important in order to account for the data quality requirements (Nardi, 2014).

Table 10: Summary of mixed method.

Phase	Research design	Data Analysis	Sample	Level of analysis
Quantitative	Cross-sectional study (existing self-reporting survey)	Multiple regression	452 answers (354 valid) from graduates applied, and interviewed for NSE	Student level – prior participants and non-participants of a VCP. Non-participants were interviewed for enrollment in the program.
Qualitative	Case-study	Thematic analysis	6 in-depth interviews of graduates from NSE	Student level – interviewing graduates from a VCP. Including two groups, graduates with previous startup experience before participating in the program and graduates without previous experience.

3.6 Limitations of Mixed Method

Although a mixed method has a lot to offer to the research, there are some limitations to the method. Combining research designs can be complex, resulting in the process being time- and resource-consuming (Doyle, Brady, & Byrne, 2009). In this study, the authors solved this by analysing an already conducted survey in quantitative analysis (further discussed in section [3.6.1](#)) and conducted a limited number for interviews in qualitative analysis (further discussed in section [3.6.2](#)). Moreover, planning and implementing one method by drawing on the findings of another method is proven to be difficult (Doyle et al., 2009), but can result in a more rich and detailed perspective (Arora & Stoner, 2009). Each separate method has its limitations, which is elaborated in the following sections.

3.6.1 Limitations of quantitative method

Systematic errors could be present and influence the data's validity (Ringdal, 2014). The survey described in section [3.2.2](#), was answered in retrospect by both participants and non-participants who graduated in the period of 2004-2018. This means that some of the respondents had longer time since graduation, which could impair their ability to remember the time spent in their educational program (Nardi, 2014). Response bias could also be a problem, where the respondent reports higher entrepreneurial passion or educational experience than what is factual (Nardi, 2014). This may be due to justify the time spent on the educational program or enhance their appearance on the program. Since the survey is a self-reporting survey, errors during reporting could be present. The results can be influenced by self-reporting bias, for instance, by informants subjectively opinion about their previous experience or recall period (Nardi, 2014). Also, the respondents may have a different understanding of the Likert Scales in the survey, which can influence their evaluation and responses (Bowen, Rose, & Pilkington, 2017). It is hard to catch if such systematic errors exist, and this could have influenced the data's validity negatively (Ringdal, 2014).

Since the survey is only given at one point in time, the quantitative analysis requires fewer resources. However, it may not be ideal for uncovering relationships that require a representation of a time sequence (Nardi, 2014), which might be the case in this study. The explanatory sequential design of the mixed method, also leads to that the results from the quantitative analysis are given less attention (Creswell & Clark, 2007). This may lead the authors not to highlight the quantitative results. Additionally, the application process for the enrollment could suffer from selection bias, since it is not guaranteed that the two groups for analysis (participants and non-participants) in the sample are randomized. This might result in the findings not being generalizable to other VCPs since randomization ensures that the sample obtained is representable and could be generalized (Nardi, 2014). In order to investigate the discriminant validity of the items in the survey, and that the items measured what it was supposed to measure (Nardi, 2014), exploratory factor analysis was conducted on the relevant items. This is presented in section [3.3.2.1](#). In addition, the survey has been evaluated and tested by focus groups from the Norwegian University of Science and Technology, Lund University and Chalmers University.

In addition, random errors might occur, which can influence the data's reliability (Ringdal, 2014). Random errors could occur when filling out the survey, for instance, if the respondent checks the wrong answer box (Ringdal, 2014). Another way of measuring the

reliability of the data is based on how the data is conducted (Ringdal, 2014). A limitation is that the authors used a current cross-sectional study and were only responsible for the data analysis and interpretation, and not data acquisition (see section 3.1). The authors were not a part of the consideration of sources, design of the survey, and how the data was conducted. This may influence the data analysis and interpretation part of the thesis, and reduce the study's reliability (Ringdal, 2014). However, the reliability of the data is measured by the Cronbach's Alpha test (Ringdal, 2014), to ensure that the same results will appear if the measurements are repeated (Nardi, 2014). The results are presented in section 3.3.2.1. In addition, before starting the statistical analysis, the authors removed the void answers from the dataset ending up with 354 after removing 97 answers. The data was checked for values outside the range of each item and non-answers, which were decoded or assigned as missing values.

3.6.2 Limitations of qualitative method

In order to enhance validity (Tjora, 2010), the authors explain the choices made and how the study was conducted in section 3.4. Because the authors conducted a mixed method, it limited the number of interviews the authors were able to conduct. Since in-depth interviews were chosen for the qualitative study, it limits the resources due to the interviews lasting for 40-60 minutes (Tjora, 2010). The authors asked open questions during the interviews, which lead to a lot of irrelevant information (Bjørndal, 2011). Handling the irrelevant information was attempted to be solved by thematic analysis and a deductive approach (Braun & Clarke, 2006). For this study, the authors conducted a thematic analysis, which is a flexible approach, providing rich and detailed data (Braun & Clarke, 2006; Bryman, 1992). However, a limitation of such an analysis is that it might not lead to new and innovative findings because, as in this case, it is much grounded in existing theory (Bowen et al., 2017). Since the informants graduated between 2014-2019, the informants told about their educational experience from the VCP and their entrepreneurial passion in retrospect. Telling about an experience in retrospect might influence the informants' ability to remember (Nardi, 2014), and could lead to potential biases as not remembering critical learning events. During the interviews, the informants also seemed to have problems with concretizing what they learned and in which context, due to lack of memory.

In this study, the authors assumed that the main difference between the informants was their prior entrepreneurial experience. This might not be the case, and the motivation for attending the program could vary between the informants, which could influence the result (Bjørndal, 2011). The authors' interest and pre-understanding of the topic might have influenced the informants to look at the authors as serious and engaged, which could improve the reliability (Bjørndal, 2011). This is because the authors were able to ask follow-up questions and keep the dialogue going during the interviews. The authors knew the informants to some degree before this study. The prior relationship between the informants and authors might lead the informants to have more trust in what they tell the authors, but also make them limit themselves based on the existing impression they want to keep with the authors (Bjørndal, 2011). All interviews were also conducted through the video conference program Zoom. This could have resulted in the informants limiting themselves if they, for instance, find it inconvenient (Bjørndal, 2011). On the other hand, the latter factors could also have made the informants more comfortable and honest, which enhances reliability (Kvale, 2006; Tjora, 2010).

4 Findings

This chapter presents the results from the quantitative and qualitative analysis applied in this thesis, presented respectively. In order to investigate the relationship between “Educational experience” and “Entrepreneurial passion”, and how a “Venture creation program” moderate this relationship, the authors present the results from the quantitative analysis in the first part. In order to further investigate how the educational experience in a VCP is related to entrepreneurial passion in such program and how critical learning events may be related to entrepreneurial passion in such program, the results from the qualitative analysis are presented in the second part.

4.1 Quantitative findings

Table 11 presents descriptive statistics on selected variables from the sample, containing the control variables presented in section [3.3.1.4](#) and the variable “Venture Creation Program” in section [3.3.1.3](#). The table presents the number of observations (Obs), mean (Mean), and standard deviation (Std.Dev) of the sample, in addition to type and domain of the corresponding variable (Type (Domain)). For the dummy variables, the mean indicates the proportion of occurrences. The type indicates if the variable is a dummy or continuous variable, whereas the domain indicates the set of possible values. The existing cross-sectional study had in total 452 answers where 97 was void, resulting in 354 valid answers (see variable “Venture Creation Program” in figure 5). The data consisted of 154 valid answers from the participant group and 200 valid answers from the non-participant group (see Obs in Table 11). The coding of the control variables are described in section [3.3.1.4](#). “Year since graduation” is the only continuous variable in Table 11, and ranges from 1-14 years, which means years since graduation varies between the respondents.

Table 11: Descriptive statistics of selected variables from the sample.

VARIABLES	Obs	Mean	Std.Dev.	Type (Domain)
Venture Creation Program	354			Dummy (1/0)
1=Participants	154	0.56497	0.49646	
0=Non-participants	200	0.43502	0.49646	
Gender	339			Dummy (1/0)
1=Female	234	0.69026	0.49306	
0=Male	105	0.30973	0.49306	
Education Background	352			Dummy (1/2/3)
1=Business	64	0.18181	0.38624	
2=STEM	232	0.65909	0.47468	
3=Social Science	56	0.15909	0.36628	
Year Since Graduation	352	4.29154	3.08118	Continuous (1-14)
Status	352			Dummy (1/2/3)
1=Single	95	0.26988	0.44453	
2=Partner	178	0.50568	0.500679	
3=Married	79	0.22443	0.41789	
Children	353			Dummy (1/0)
1=Have Children	261	0.260623	0.43959	
0=None Children	92	0.73937	0.43959	
Grades above Average	354			Dummy (1/0)
1=Have Grades above Average	264	0.74576	0.43604	
0=Grades average or below	90	0.25423	0.43604	
Parent with Higher Education	354			Dummy (1/0)
1= Have Parent with Higher Education	281	0.79378	0.40515	
0= None Parent with Higher Education	73	0.20621	0.40515	
Entrepreneurs in Family or Friends	343			Dummy (1/0)
1= Have an Entrepreneur in Family or Friends	286	0.833819	0.37278	
0=None Entrepreneur in Family or Friends	57	0.16618	0.37278	

4.1.1 Educational experience and Entrepreneurial Passion

In hypothesis 1a, 1b, and 1c (see section 2.2.3), the authors argued that the educational experience is positively related to passion for inventing, founding and developing. Firstly, hypothesis 1a is tested for passion for inventing, without (model 1, 2, 3 and 4 in Table 12) and with control variables (model 5, 6, 7, 8 in Table 12). This relationship is confirmed by regression for the components "Knowledge and skills" ($\beta=2.653$, $p<.01$), "Judgement ability and decision making" ($\beta=2.561$, $p<.01$), "Social- and networking abilities" ($\beta=2.500$, $p<.01$) and "Teamwork abilities" ($\beta=2.308$, $p<.01$) for "Passion for inventing". These results are bold in Table 12, meaning that the components of educational experience influence passion for inventing, positively. This result confirms hypothesis 1a. Among the control variables, the variables "Year since Graduation» and «Parent with Higher Education» are significant on a $p<.05$ level. This means that for instance that the respondents with longer time since graduation has lower passion for inventing score and having a parent with higher education have a positively affect. "Entrepreneurs in family or

friends" are also significant on a $p < .01$ level, and «Educational Background, STEM=2» is significant, but only on a $p < .1$ level in three of the models.

Table 12: Result for hypothesis 1a - multivariate regression of "Knowledge and skills", "Judgement ability and decision making", "Social-and networking abilities" and "Teamwork abilities" on "Passion on inventing".

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Passion for inventing	Passion for inventing	Passion for inventing	Passion for inventing	Passion for inventing	Passion for inventing	Passion for inventing	Passion for inventing
Knowledge and skills	2.916*** (0.394)				2.653*** (0.435)			
Judgement ability and decision making		3.027*** (0.415)				2.561*** (0.453)		
Social- and networking abilities			2.787*** (0.363)				2.500*** (0.381)	
Teamwork abilities				2.857*** (0.466)				2.308*** (0.488)
Gender = 1, Female					-0.362 (1.420)	-0.264 (1.434)	-0.822 (1.405)	-0.973 (1.446)
Educational Background = 2, STEM					4.293*** (1.656)	3.238* (1.687)	2.902* (1.644)	3.103* (1.692)
Educational Background = 3, Social Science					-0.147 (2.261)	-1.711 (2.232)	-1.477 (2.181)	-1.911 (2.245)
Year since Graduation					-0.582*** (0.244)	-0.511** (0.248)	-0.521** (0.245)	-0.542*** (0.250)
Status = 2, Partner					-0.602 (1.557)	-0.305 (1.562)	-0.531 (1.536)	-0.591 (1.582)
Status = 3, Married					-2.289 (2.122)	-2.665 (2.142)	-2.207 (2.112)	-2.395 (2.173)
Children					1.782 (1.830)	1.834 (1.854)	1.751 (1.821)	1.805 (1.875)
Grades Above Average					-2.128 (1.421)	-2.162 (1.436)	-1.663 (1.408)	-1.495 (1.448)
Parent with Higher Education					0.988 (1.586)	1.172 (1.616)	1.118 (1.578)	1.597 (1.620)
Entrepreneurs in Family or Friends					4.067** (1.718)	3.814** (1.724)	3.909*** (1.701)	3.987** (1.756)
Constant	21.14*** (1.775)	18.89*** (2.091)	20.61*** (1.774)	18.39*** (2.532)	20.01*** (3.476)	19.62*** (3.683)	20.45*** (3.374)	19.40*** (3.882)
Observations	344	343	346	345	312	311	314	315
R-squared	0.138	0.135	0.147	0.099	0.187	0.178	0.201	0.150

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Secondly, hypothesis 1b is tested for passion for founding, without (model 1,2, 3 and 4 in Table 13) and with control variables (model 5, 6, 7, 8 in Table 13). This relationship is confirmed by regression for the components "Knowledge and skills" ($\beta=2.151$, $p<.01$), "Judgement ability and decision making" ($\beta=1.532$, $p<.01$), "Social- and networking abilities" ($\beta=2.374$, $p<.01$) and "Teamwork abilities" ($\beta=1.167$, $p<.1$) for "Passion for founding". These results are bold in Table 13, meaning that the components of educational experience influence passion for founding, positively. This result confirms hypothesis 1b. Among the control variables, "Gender" is significant on a $p<.01$ level. This indicates that female respondents have a lower passion for founding score.

Table 13: Result of hypothesis 1b - multivariate regression of "Knowledge and Skills", "Judgement ability and Decision making", "Social- and networking abilities" and "Teamwork abilities" on "Passion for founding".

VARIABLES	(1) Passion for founding	(2) Passion for founding	(3) Passion for founding	(4) Passion for founding	(5) Passion for founding	(6) Passion for founding	(7) Passion for founding	(8) Passion for founding
Knowledge and skills	2.975*** (0.455)				2.151*** (0.491)			
Judgement ability and decision making		2.534*** (0.490)				1.532*** (0.518)		
Social- and networking abilities			2.853*** (0.416)				2.374*** (0.422)	
Teamwork abilities				2.007*** (0.542)				1.167*** (0.546)
Gender = 1, Female					-7.553*** (1.587)	-7.981*** (1.611)	-7.889*** (1.541)	-8.147*** (1.605)
Educational Background = 2, STEM					1.185 (1.857)	-0.146 (1.904)	-0.0162 (1.813)	0.374 (1.887)
Educational Background = 3, Social Science					-1.541 (2.512)	-3.555 (2.498)	-2.547 (2.384)	-3.421 (2.483)
Year since Graduation					-0.286 (0.275)	-0.328 (0.281)	-0.236 (0.271)	-0.277 (0.281)
Status = 2, Partner					-1.702 (1.728)	-1.296 (1.745)	-1.353 (1.677)	-1.574 (1.747)
Status = 3, Married					-1.965 (2.374)	-1.619 (2.408)	-1.746 (2.321)	-2.001 (2.416)
Children					-0.700 (2.058)	-0.243 (2.095)	-0.816 (2.011)	-0.789 (2.095)
Grades Above Average					-0.712 (1.600)	-0.414 (1.625)	-0.456 (1.558)	-0.0667 (1.620)
Parent with Higher Education					0.429 (1.767)	0.852 (1.808)	0.348 (1.727)	0.906 (1.794)
Entrepreneurs in Family or Friends					2.711 (1.878)	2.813 (1.897)	2.282 (1.827)	2.777 (1.914)
Constant	11.52*** (2.058)	11.95*** (2.483)	10.91*** (2.044)	13.47*** (2.948)	17.39*** (3.894)	19.76*** (4.159)	16.46*** (3.707)	20.52*** (4.296)
Observations	346	345	348	347	314	313	316	317
R-squared	0.111	0.072	0.120	0.038	0.185	0.165	0.216	0.148

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Lastly, hypothesis 1c is tested for passion for developing, without (model 1,2, 3 and 4 in Table 14) and with control variables (model 5, 6, 7, 8 in Table 14). This relationship is confirmed by regression for the components "Knowledge and skills" ($\beta=2.381$, $p<.01$), "Judgement ability and decision making" ($\beta=1.630$, $p<.01$), "Social- and networking abilities" ($\beta=2.318$, $p<.01$) and "Teamwork abilities" ($\beta=1.606$, $p<.01$) for "Passion for developing". These results are bold in Table 14, meaning that the components of educational experience influence passion for developing, positively. This result is confirmed hypothesis 1c. Among the control variables, "Gender" and "Entrepreneurs in family or friends" is significant on a $p<.01$ and $p<.05$ level, respectively.

Table 14: Result of hypothesis 1c - multivariate regression of "Knowledge and skills", "Judgement ability and Decision making", "Social- and Networking abilities" and "Teamwork abilities" on "Passion for developing".

VARIABLES	(1) Passion for developing	(2) Passion for developing	(3) Passion for developing	(4) Passion for developing	(5) Passion for developing	(6) Passion for developing	(7) Passion for developing	(8) Passion for developing
Knowledge and Skills	2.814*** (0.385)				2.381*** (0.431)			
Judgement ability and Decision Making		2.406*** (0.414)				1.630*** (0.455)		
Social- and Networking abilities			2.786*** (0.349)				2.318*** (0.372)	
Teamwork abilities				2.337*** (0.452)				1.606*** (0.476)
Gender = 1, Female					-4.390*** (1.390)	-4.994*** (1.424)	-4.844*** (1.357)	-5.063*** (1.414)
Educational Background = 2, STEM					1.005 (1.626)	0.0600 (1.684)	-0.189 (1.598)	0.163 (1.664)
Educational Background = 3, Social Science					-1.685 (2.199)	-3.426 (2.207)	-2.956 (2.098)	-3.577 (2.186)
Year since Graduation					-0.194 (0.240)	-0.209 (0.247)	-0.145 (0.237)	-0.167 (0.246)
Status = 2, Partner					-0.686 (1.517)	-0.126 (1.547)	-0.290 (1.481)	-0.493 (1.544)
Status = 3, Married					-1.085 (2.080)	-0.761 (2.132)	-0.943 (2.046)	-1.183 (2.131)
Children					-0.720 (1.798)	-0.444 (1.848)	-0.991 (1.767)	-0.975 (1.842)
Grades Above Average					-1.806 (1.397)	-1.257 (1.432)	-1.359 (1.367)	-1.003 (1.422)
Parent with Higher Education					0.0893 (1.545)	0.967 (1.596)	0.121 (1.519)	0.640 (1.579)
Entrepreneurs in Family or Friends					4.270*** (1.656)	3.971*** (1.688)	3.544*** (1.620)	3.763*** (1.698)
Constant	14.21*** (1.747)	14.59*** (2.097)	13.28*** (1.715)	13.84*** (2.457)	16.06*** (3.426)	18.35*** (3.678)	16.57*** (3.271)	18.24*** (3.779)
Observations	345	344	347	346	313	312	315	316
R-squared	0.134	0.090	0.156	0.072	0.193	0.154	0.213	0.144

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Summarized, hypothesis 1a, 1b and 1c are confirmed revealing a positive relationship between the components of educational experience, "Knowledge and skills", "Judgement ability and decision making", "Social- and networking abilities" and "Teamwork abilities" and passion for inventing, founding and developing, respectively.

4.1.2 Venture Creation Program as a Moderator on the relationship between Educational Experience and Entrepreneurial Passion

In hypothesis 2a, 2b, and 2c (see section [2.3.1](#)), the authors argued that the relationship confirmed in hypothesis 1a, 1b, and 1c, is moderated by participation in a VCP. This is tested by using (Fairchild & MacKinnon, 2009) general model for testing moderation effects, as presented in section [3.3.2.3](#). Firstly, hypothesis 2a investigates the relationship between the components of "Educational experience" and "Passion for inventing", without (model 1,2, 3 and 4 in Table 15) and with control variables (model 5, 6, 7, 8 in Table 15). This moderation effect is only confirmed on the relationship between "Social- and networking abilities" and "Passion for inventing", presented in model 7 in Table 15. The regression coefficient for the interaction term between "Social- and networking abilities" and "Venture creation program" ($\beta=2.102$, $p<.1$), which is an estimate of the moderation effect, is significant on a $p<.1$ level. This is presented in bold for the term "Interaction term: Venture creation program and Social- and networking abilities" in model 7 in Table 15. The coefficient indicates how much the score of "Passion for inventing" is expected to increase from "Social- and networking abilities" in a VCP, compared to non-participants in such a program. Although the result is only significant on a $p<.1$ level, this result is interesting to investigate further in the qualitative analysis. None of the other interaction terms between the other components of educational experience and "Venture creation program" is significant, presented in bold in Table 13. This result partly confirms hypothesis 2a, revealing that "Venture creation program" moderate the relationship between the component "Social-and Networking abilities" and "Passion for inventing". Among the control variables, "Year since graduation" and "Entrepreneuris in Familiy or Friends» are significant on a $p<.05$ level in the majority of the models.

Table 15: Result of hypothesis 2a - general model for testing venture creation program as a moderator on the relationship between "Knowledge and skills", "Judgement ability and decision making", "Social- and networking abilities" and "Teamwork abilities" and «Passion for inventing».

VARIABLES	(1) Passion for inventing	(2) Passion for inventing	(3) Passion for inventing	(4) Passion for inventing	(5) Passion for inventing	(6) Passion for inventing	(7) Passion for inventing	(8) Passion for inventing
Knowledge and skills	1.981*** (0.495)				1.610*** (0.564)			1.847*** (0.623)
Interaction term: Knowledge and skills and Venture Creation Program	1.214 (1.055)	2.300*** (0.534)			1.500 (1.081)	1.814*** (0.604)		
Judgement ability and decision making		0.0595 (1.064)	1.766*** (0.480)			0.0932 (1.118)	1.533*** (0.525)	
Interaction term: Judgement ability and decision making and Venture Creation Program			2.234** (1.074)				2.102* (1.089)	
Social- and networking abilities				2.346*** (0.583)				
Interaction term: Social- and networking abilities and Venture Creation Program				-0.304 (0.996)				-0.200 (1.048)
Teamwork abilities					7.420 (5.562)			
Interaction term: Teamwork abilities and Venture Creation Program								
Venture Creation Program = 1, Participant	-1.328 (5.164)	4.163 (5.749)	-8.337 (5.847)	7.420 (5.562)	-2.862 (5.234)	3.904 (5.956)	-8.028 (5.850)	6.554 (5.821)
Gender = 1, Female					-1.123 (1.424)	-1.074 (1.456)	-1.406 (1.415)	-1.683 (1.430)
Educational Background = 2, STEM					2.995* (1.687)	2.842 (1.713)	2.159 (1.655)	2.220 (1.669)
Educational Background = 3, Social Science					-0.522 (2.241)	-1.418 (2.213)	-1.291 (2.164)	-1.359 (2.207)
Year since Graduation					-0.657*** (0.242)	-0.589*** (0.247)	-0.555*** (0.245)	-0.657*** (0.247)
Status = 2, Partner					-0.574 (1.537)	-0.346 (1.545)	-0.776 (1.527)	-0.654 (1.545)
Status = 3, Married					-2.522 (2.096)	-2.862 (2.119)	-2.517 (2.098)	-2.669 (2.123)
Children					1.632 (1.809)	1.671 (1.833)	1.513 (1.811)	1.833 (1.833)
Grades Above Average					-2.017 (1.417)	-1.889 (1.465)	-1.707 (1.404)	-1.222 (1.439)
Parent with Higher Education					0.645 (1.572)	0.642 (1.609)	0.964 (1.574)	0.791 (1.618)
Entrepreneurs in Family or Friends					3.591** (1.702)	3.531** (1.707)	3.464** (1.691)	3.464** (1.721)
Constant	23.02*** (1.961)	20.44*** (2.398)	23.47*** (1.992)	18.61*** (2.992)	24.44*** (3.821)	22.74*** (4.110)	24.39*** (3.691)	21.48*** (4.238)
Observations	344	343	346	345	312	311	314	315
R-squared	0.168	0.163	0.171	0.152	0.213	0.202	0.219	0.195

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Secondly, hypothesis 2b investigates the relationship between the components of "Educational experience" and "Passion for founding", without (model 1,2, 3 and 4 in Table 16) and with control variables (model 5, 6, 7, 8 in Table 16). The moderating effect on the relationship between the components of "Educational experience" and "Passion for founding" is rejected. This is because none of the interaction terms between the components of educational experience and venture creation program is significant, presented in bold in Table 16. These results reject hypothesis 2b. Among the control variables, the control variable "Gender" is significant on a $p < .01$ level.

Table 16: Result hypothesis 2b - general model for testing venture creation program as a moderator on the relationship between "Knowledge and skills", "Judgement and decision making", "Social- and networking abilities" and "Teamwork abilities" on "Passion for founding».

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Passion for founding	Passion for founding	Passion for founding	Passion for founding	Passion for founding	Passion for founding	Passion for founding	Passion for founding
Knowledge and skills	2.481*** (0.578)				1.257** (0.635)			
Interaction term: Knowledge and skills and Venture Creation Program	0.165 (1.247)				0.697 (1.233)			
Judgement ability and decision making		2.001*** (0.635)				0.404 (0.684)		
Interaction term: Judgement ability and decision making and Venture Creation Program		-0.427 (1.291)				0.626 (1.281)		
Social- and networking abilities			2.274*** (0.556)				1.515*** (0.583)	
Interaction term: Social- and networking abilities and Venture Creation Program			1.360 (1.253)				1.687 (1.212)	
Teamwork abilities				1.433** (0.684)				0.395 (0.695)
Interaction term: Teamwork abilities and Venture Creation Program				0.0109 (1.176)				0.505 (1.161)
Venture Creation Program = 1, Participant	2.214 (6.133)	6.150 (7.007)	-5.341 (6.838)	5.237 (6.573)	1.239 (5.990)	2.368 (6.850)	-5.966 (6.514)	3.315 (6.438)
Gender = 1, Female					-8.382*** (1.600)	-9.153*** (1.629)	-8.420*** (1.560)	-9.054*** (1.586)
Educational Background = 2, STEM					-0.0561 (1.901)	-1.218 (1.926)	-0.700 (1.834)	-0.750 (1.865)
Educational Background = 3, Social Science					-1.707 (2.499)	-3.199 (2.465)	-2.385 (2.377)	-2.622 (2.441)
Year since Graduation					0.274 (0.274)	-0.358 (0.278)	-0.274 (0.272)	-0.368 (0.276)
Status = 2, Partner					-1.620 (1.713)	-1.289 (1.717)	-1.548 (1.675)	-1.540 (1.706)
Status = 3, Married					-2.143 (2.352)	-1.828 (2.371)	-2.004 (2.314)	-2.213 (2.360)
Children					-0.793 (2.040)	-0.469 (2.063)	-1.001 (2.007)	-0.826 (2.049)
Grades Above Average					-0.481 (1.598)	-0.210 (1.612)	-0.451 (1.556)	-0.0386 (1.602)
Parent with Higher Education					0.0741 (1.755)	0.277 (1.788)	0.164 (1.726)	0.294 (1.778)
Entrepreneurs in Family or Friends					2.305 (1.868)	2.548 (1.868)	2.004 (1.825)	2.310 (1.873)
Constant	12.29*** (2.297)	12.89*** (2.859)	12.57*** (2.319)	14.19*** (3.512)	20.89*** (4.300)	24.45*** (4.631)	20.11*** (4.081)	23.85*** (4.723)
Observations	346	345	348	347	314	313	316	317
R-squared	0.120	0.088	0.126	0.074	0.206	0.197	0.228	0.192

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Lastly, hypothesis 2c investigates the relationship between the components of "Educational experience" and "Passion for developing", without (model 1,2, 3 and 4 in Table 17) and with control variables (model 5, 6, 7, 8 in Table 17). This moderation effect is only confirmed on the relationship between "Social-and networking abilities" and "Passion for developing". The regression coefficient for interaction term between "Social-and networking abilities" and "Venture creation program" ($\beta=1.956$, $p<.1$), which is an estimate of the moderation effect, is significant for $p<.1$. This is presented in bold for the term "Interaction term: Venture creation program and Social-and networking abilities" in model 7 in Table 17. The coefficient indicates how much the score of "Passion for developing" is expected to increase from "Social-and networking abilities" in a VCP, compared to non-participants in such program. Although the result is only significant on a $p<.1$ level, this result is interesting to investigate further in the qualitative analysis. None of the other interaction terms between the other components of educational experience and venture creation program is significant, presented in bold in Table 15. This result partly confirms hypothesis 2c, revealing that VCP moderates the relationship between the component "Social-and networking abilities" and "Passion for developing". Among the control variables, "Gender" and "Entrepreneurs in family or friends" are significant on a $p<.01$ and $p<.05$ level, respectively.

Table 17: Result hypothesis 2c - general model for testing venture creation program as a moderator on the relationship between "Knowledge and skills", "Judgement and decision making", "Social- and networking abilities" and "Teamwork abilities" on "Passion for developing».

VARIABLES	(1) Passion for developing	(2) Passion for developing	(3) Passion for developing	(4) Passion for developing	(5) Passion for developing	(6) Passion for developing	(7) Passion for developing	(8) Passion for developing
Knowledge and skills	2.472*** (0.491)				1.928*** (0.563)			
Interaction term: Knowledge and skills and Venture Creation Program	-0.0689 (1.043)				0.0778 (1.075)			
Judgement ability and decision making		2.147*** (0.538)				1.141* (0.608)		
Interaction term: Judgement ability and decision making and Venture Creation Program		-0.993 (1.064)				-0.608 (1.113)		
Social- and networking abilities			2.314*** (0.466)				1.674*** (0.513)	
Interaction term: Social and networking abilities and Venture Creation Program			1.685 (1.042)			1.956* (1.060)		
Teamwork abilities				2.129*** (0.576)				1.331** (0.617)
Interaction term: Teamwork abilities and Venture Creation Program				-0.610 (0.970)				-0.381 (1.015)
Venture Creation Program = 1, Participant	2.688 (5.119)	8.431 (5.750)	-8.097 (5.680)	7.403 (5.411)	2.368 (5.217)	7.179 (5.927)	-8.992 (5.699)	6.480 (5.618)
Gender = 1, Female					-4.889*** (1.449)	-5.653*** (1.449)	-5.129*** (1.375)	-5.647*** (1.409)
Educational Background = 2, STEM					0.340 (1.676)	-0.408 (1.713)	-0.674 (1.618)	-0.602 (1.658)
Educational Background = 3, Social Science					-1.711 (2.204)	-3.019 (2.193)	-2.865 (2.094)	-3.102 (2.167)
Year since Graduation					-0.241 (0.240)	-0.291 (0.247)	-0.141 (0.239)	-0.256 (0.245)
Status = 2, Partner					-0.655 (1.513)	-0.726 (1.533)	-0.453 (1.479)	-0.550 (1.521)
Status = 3, Married					-1.192 (2.076)	-0.973 (2.112)	-1.107 (2.043)	-1.378 (2.100)
Children					-0.736 (1.796)	-0.572 (1.830)	-1.236 (1.767)	-0.892 (1.818)
Grades Above Average					-1.593 (1.409)	-0.903 (1.433)	-1.493 (1.369)	-0.773 (1.422)
Parent with Higher Education					-0.136 (1.546)	0.506 (1.589)	0.0860 (1.520)	0.0201 (1.579)
Entrepreneurs in Family or Friends					4.056** (1.659)	3.825** (1.672)	3.324** (1.619)	3.478** (1.675)
Constant	14.644*** (1.956)	14.58*** (2.425)	14.84*** (1.945)	13.21*** (2.961)	17.73*** (3.811)	20.10*** (4.120)	19.47*** (3.597)	19.25*** (4.196)
Observations	345	344	347	346	313	312	315	316
R-squared	0.143	0.107	0.163	0.102	0.203	0.176	0.223	0.175

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Summarized, hypothesis 2a and 2c is partly confirmed, but only on a $p < .1$ significance level. This result reveals that "Venture creation program" has a positive moderating effect on the relationship between "Social- and networking abilities" and "Passion for inventing", and «Social-and networking abilities» and «Passion for developing». Hypothesis 2b is rejected, "Venture creation program" is not found to moderate the relationship between the components of educational experience and "Passion for founding".

4.2 Qualitative findings

The results from the quantitative analysis revealed that educational experience has a positive influence on all dimensions of entrepreneurial passion (confirmed in hypothesis 1a, 1b, and 1c in section [4.1.1](#)). Additionally, the venture creation program turned out to have a positive moderating effect on the relationship between the component "Social-and networking abilities" of educational experience and "Passion for inventing" and "Passion for developing" (confirmed in hypothesis 2a and 2c in section [4.1.2](#)). The quantitative analysis indicates that there exists a relationship between educational experience, entrepreneurial competence (knowledge, skills and abilities) acquired in entrepreneurship education, and entrepreneurial passion. A VCP might seem to have a moderating effect, through facilitating for educational experience related to social-and networking abilities. These results laid the basis for the conduct of the qualitative case study.

In the qualitative analysis, investigating in-depth how educational experience in a VCP is related to entrepreneurial passion. Since a VCP might have a moderating effect, the authors further want to investigate how critical learning events experienced in a VCP is related to entrepreneurial passion. The following sections present the result from the qualitative analysis. The authors have transcribed and analyzed six in-depth interviews with Braun & Clarke's (2006) thematic analysis. The results will be separated into three parts, presenting the occurred codes related to "Entrepreneurial passion", "Educational experience" and "Critical learning events". For each section, the links uncovered between the themes will also be presented. The tables presenting the findings in this chapter are explained in section [3.4.2](#).

4.2.1 Entrepreneurial Passion and Educational Experience

Table 18 separates “Entrepreneurial passion” into sub-themes and presents the number of occurrences of the-sub themes, for each group (see Table 2) and in total. Codes marked with red indicates negative or obsessive passion. A shade of grey is used to elevate important findings where a darker shade indicates a higher number of occurrences.

Table 18: Occurrences of Entrepreneurial passion codes.

Codes		Participants with previous startup experience (Informant 3, 5 and 6)	Participants without previous startup experience (Informant 1, 2 and 4)	Total number of occurrences
Main Theme	Sub-theme			
Entrepreneurial passion	Intense positive feelings	10	6	16
	Identity centrality	7	6	13
	Passion for inventing	9	17	26
	Passion for founding	3	2	5
	Passion for developing	3(1)	2	5(1)

The most frequent dimension of entrepreneurial passion is “Passion for inventing”. This dimension of passion occurred amongst all informants in the study, and Informant 4 describes:

“My daily life, when studying at NSE consisted of mapping customers' needs and prototype ideas we wanted to present to the market. It was the most engaging part!”

The two components of entrepreneurial passion presented by Melissa S. Cardon et al. (2009), “Intense positive feelings” and “Identity centrality” do also show a high number of occurrences in the data. Several of the graduates linked their passion to their identity as an entrepreneur, as Informant 2 states:

“NSE is what I needed to be able to be an entrepreneur.”

During the interviews, all informants showed the presence of entrepreneurial passion which was connected to their participation in the program. This was presented by, e.g. Informant 5, stating that:

“If I could choose any job I wanted, the one I got through my startup at NSE would be my dream job. I learned a lot, starting up a business during my time in the program, which was essential to be able to form my role.”

Additionally, all informants described themselves as generally easily engaged people. Three of the informants also stated that participation in NSE had a direct influence on their entrepreneurial passion. This is stated by e.g. Informant 5:

"I did definitely obtain entrepreneurial passion from my time at NSE."

Another interesting finding was Informant 6 description of "Passion for inventing" experienced when participating in the VCP, which is linked to the emerged "Passion for developing" later on.

"What I like to work within the startup has varied based on the needs. In the beginning, I liked working with development. Later it became sales, which might actually be what I find most engaging today. The adrenaline and rush you get when signing a million-dollar deal, and be able to see the value of something you build from the bottom."

On the other hand, Informant 5, who just graduated from the VCP, showed negative emotions related to "Passion for developing".

"I do not find operations inspiring to work with, and do not like the tasks related to customer support and sales."

However, "Passion for developing" was only present amongst two of the informants. These informants have both longer time since graduation and currently work in a startup.

Table 19 separate "Educational experience" into sub-themes and presents the number of occurrences of the sub-themes, for each group (see Table 2) and in total. A shade of grey is used to elevate important findings where a darker shade indicates a higher number of occurrences.

Table 19: Occurrences of Educational Experience codes.

Codes		Participants with previous startup experience (Informant 3, 5 and 6)	Participants without previous startup experience (Informant 1,2 and 4)	Total number of occurrences
Main Theme	Sub-theme			
Educational experience	Knowledge and skills	3	7	10
	Judgemental ability and decision making	2	5	7
	Social- and networking abilities	6	9	15
	Teamwork abilities	1	4	5

The most frequent component of "Educational experience" is "Social- and networking abilities", which is common for all six informants. The importance of the network they gained during their participation in the VCP, is highlighted in the data in all interviews, e.g. described by Informant 1:

"We had to learn things we did not know anything about from before, made us find new networks and people that could help us. It was one important ability I got from my time at NSE. The culture of sharing at NSE is unique. It is an environment of interdisciplinary backgrounds and competence, with people willing to share their knowledge and experiences - which I really like. You can always reach out to someone via ESAF (alumni network) or the network you gain during NSE."

Further on, the components “Knowledge and skills” and “Judgemental ability and decision making” occurring amongst most of the informants. For example, did “Judgemental ability and decision making” turn out to be an important learning component for several of the informants, as described by Informant 4:

"During my time at NSE I learned to be very objective regarding your assumption of the customers' needs, and not to base too much on your own opinion. You do not always know best. Therefore you have to take into account objective fact and be critical to your assumption."

4.2.1.1 The link between Entrepreneurial Passion and Educational Experience

Table 20 shows the links between “Entrepreneurial passion” and “Educational experience”. Each of the main themes is separated into the different components the variable consists of (see Table 3 and Table 4). Further, the table presents how these sub-themes from “Entrepreneurial passion” and “Educational experience” are linked through the data. This is presented as the number of occurrences for each link, of each group (see table 2) and in total.

The analysis resulted in a total of 11 strings of text, connecting “Entrepreneurial passion” and “Educational experience”. This is presented in the following table. A shade of grey is used to elevate important findings where a darker shade indicates a higher number of occurrences.

Table 20: Links uncovered between Entrepreneurial passion and Educational experience.

Coding based linkages in interviews		Participants with previous startup experience (Informant 3, 5 and 6)	Participants without previous startup experience (Informant 1, 2 and 4)	Number of occurrences in total
Entrepreneurial passion	Educational experience			
Intense positive feelings	Teamwork abilities	-	1	1
Passion for inventing	Judgemental ability and decision making	-	3	3
Intense positive feelings	Judgemental ability and decision making	1	-	1
Intense positive feelings	Knowledge and skills	-	1	1
Identity centrality	Knowledge and skills	-	2	2
Intense positive feelings	Social- and networking abilities	-	1	1
Identity centrality	Social- and networking abilities	-	1	1
Passion for inventing	Social- and networking abilities	1	-	1

The most frequent link between the development of "Entrepreneurial passion" and the "Educational experience" is the "Passion for inventing" and "Judgemental ability and decision making". This appeared in, e.g. the reflection to Informant 1:

"I felt that I was able to contribute to something important. It was very motivational to visions that we would deliver the final product. We solved a direct problem which would change the workdays for many people."

Further, "Social- and networking abilities" has second most number of links to the different components of "Entrepreneurial passion", "Intense positive feelings", "Identity centrality" and "Passion for inventing". "Passion for inventing" is the only dimension of passion represented, and is connected to the following components of "Educational experience", "Judgemental ability and decision making" and "Social- and networking abilities". The group "Participants without previous startup experience" had the most links between "Entrepreneurial passion" and "Educational experience".

4.2.2 Critical Learning Events and Educational Experience

The link between "Critical learning events" and "Educational Experience" was not the main focus in the qualitative analysis. However, 10 strings of text which linked "Critical learning events" to "Educational experience" occurred during the interviews, presented in Table 21. As described in section [2.3.2](#), significant "events" or "episodes" might influence the entrepreneurial learning process experienced in an entrepreneurship education (Cope & Watts, 2000; Deakins & Freel, 1998; Rae & Carswell, 2001). This might indicate that there is a link between critical learning events and educational experience in an entrepreneurship education setting.

These strings occurred based on the informants' open reflection on their educational experience. Each of the main themes is separated into the different components the variable consists of (see Table 4 and Table 5). Further, the table presents how these sub-themes from "Critical learning events" and "Educational experience" is linked through the data. This is presented as the number of occurrences for each link, of each group (see table 2) and in total. A shade of grey is used to elevate important findings where a darker shade indicates a higher number of occurrences.

Table 21: Links uncovered between Educational experience and Critical learning events.

Coding based linkages in interviews		Participants with previous startup experience (Informant 3, 5 and 6)	Participants without previous startup experience (Informant 1, 2 and 4)	Number of occurrences in total
Educational experience	Critical learning events			
Social- and networking abilities	Uncertainty and confusion	-	1	1
Teamwork abilities	Overcoming knowledge and skills gaps	-	1	1
Teamwork abilities	Teamwork experience	1	-	1
Social- and networking abilities	Interacting with the outside world	-	3	3
Knowledge and skills	Interacting with the outside world	1	-	1
Social- and networking abilities	Uncertainty and confusion	-	1	1
Teamwork abilities	Overcoming knowledge and skills gaps	-	1	1
Teamwork abilities	Teamwork experience	1	-	1

“Teamwork abilities” and “Social- and networking abilities” is the educational experience components that have the most links to different critical learning events. The most frequent link between “Educational experience” and “Critical learning events” is “Social- and networking abilities” and “Interacting with the outside world”, which also have occurred amongst most informants. Informant 4 expressed:

“One of the most surprising abilities I find most important from my time at NSE is as simple as having the guts to pick up the phone and call relevant people you would benefit from talking to. It is beneficial, and I think I first realised how important it is after I graduated from NSE.”

In relation to the results presented in Table 21, the group of informants “Participants without previous startup experience” turned out to be the group with the most links between “Educational experience” and “Critical learning events”.

4.2.3 Critical Learning Events and the link to Entrepreneurial Passion

Table 22 separate “Critical learning events” into sub-themes and presents the number of occurrences for the sub-themes, for each group (see Table 2) and in total. Codes marked with red indicates that the data is linked to negative emotions or obsessive passion. A shade of grey is used to elevate important findings where a darker shade indicates a higher number of occurrences.

Table 22: Occurrences of Critical learning events codes.

Codes		Participants with previous startup experience (Informant 3, 5 and 6)	Participants without previous startup experience (Informant 1, 2 and 4)	Total number of occurrences
Main Theme	Sub-theme (axial codes)			
Critical learning events	Uncertainty and confusion	3	6	9
	Theory versus practice	5	-	5
	Support from outside of the learning environment	3	3	6
	Teamwork experience	6	8(3)	14(3)
	Time pressure	3	1(1)	4(1)
	Individual differences between the students	17	4	21
	Overcoming knowledge and skills gaps	2	8	11
	Interacting with the outside world	6	9	15
	Leadership and managing people	-	2(1)	2(1)

The most frequent «Critical learning event» is “Individual differences between the students”. For this critical learning event, there was a big difference in the number of occurrences between the two groups, “Participants with previous startup experience” and “Participants without previous startup experience”. The data that appeared in the critical learning event “Individual differences between the students” for the group, “Participants with previous startup experience”, highlighted the importance of their previous startup experience, an existing network consisting of friends and family and previous educational experience. The previous educational experience did relate to both entrepreneurial education and other types of education. Informant 6 did describe the impact of his previous education:

“With a goal of running my own business at the end, I learned economics and business establishment at high school. Management from the Norwegian Army, one year of entrepreneurship and economics at NTNU Business School, followed by civil engineering in computer engineering before NSE.”

Further, “Interacting with the outside world” is the second most frequent event. This is also the only event all of the informants have experienced in the VCP. Informant 3 describes the importance of “Interacting with the outside world” for her learning during the program:

"We were challenged to use our network, which I found intimidating, to begin with. However, after the feasibility studies, I got the attitude of "I will rather just call this person" because people usually want to help. It has led me not to be afraid of asking for help."

"Interacting with the outside world" is closely followed by the critical learning event "Teamwork experience". As expressed by Informant 6, he includes the teamwork experience during the feasibility studies as an important source for his educational experience and entrepreneurial passion.

"I especially remember the feasibility studies. The work moral was great, and we worked hard to accomplish goals during a short period. A great team is a motivating factor for me."

4.2.3.1 The link between Critical Learning Events and Entrepreneurial Passion

Table 23 shows the links between "Entrepreneurial passion" and "Critical learning events". Each of the main themes is separated into the different components the variable consists of. Further, the table presents how these sub-themes are linked through the data. This is presented as the number of occurrences for each link, of each group (see Table 2) and in total. Each "Critical learning event" has a summary of how many links each separate event has to "Entrepreneurial passion".

There is limited research on this field. However, as presented in section [2.3.2](#), there has been found a link between the "Critical learning events" and "Entrepreneurial passion" (Lackeus, 2013), but entrepreneurial passion was not of primary interest in Lackeus' (2013) work. In this study, the authors were able to uncover a total of 38 strings of data, connecting "Critical learning events" to "Entrepreneurial passion". This is presented in the following table. A shade of grey is used to elevate important findings where a darker shade indicates a higher number of occurrences.

Table 23: Links uncovered between Critical learning events and Entrepreneurial Passion.

Coding based linkages in interviews		Participants with previous startup experience (Informant 3, 5 and 6)	Participants without previous startup experience (Informant 1, 2 and 3)	Number of occurrences in total
Entrepreneurial passion	Critical learning events			
Intense positive feelings	Uncertainty and confusion	-	1	1
Identity centrality	Uncertainty and confusion	-	1	1
Total links of sub-themes of Entrepreneurial Passion and Uncertainty and confusion				2
Intense positive feelings	Overcoming knowledge and skills gaps	4	4	8
Passion for inventing	Overcoming knowledge and skills gaps	-	1	1
Total links of between sub-themes of Entrepreneurial Passion and Overcoming knowledge and skills gaps				9
Intense positive feelings	Teamwork experience	1	3	4
Passion for founding	Teamwork experience	-	1	1
Passion for developing	Teamwork experience	-	-	1
Obsessive passion	Teamwork experience	-	1(1)	(1)
Total links of sub-themes of Entrepreneurial Passion and Teamwork experience				7(1)
Intense positive feelings	Interacting with the outside world	3	2	5
Identity centrality	Interacting with the outside world	-	1	1
Passion for inventing	Interacting with the outside world	3	3	6
Total links of Entrepreneurial Passion and Interacting with the outside world				12
Intense positive feelings	Support from outside of the learning environment	2	-	2
Passion for inventing	Support from outside of the learning environment	-	1	1

Total links of between sub-themes of Entrepreneurial Passion and Support from outside of the learning environment				3
Intense positive feelings	Time pressure	1	-	1
Obsessive passion	Time pressure	-	1(1)	1(1)
Total links of between sub-themes of Entrepreneurial Passion and Time pressure				2(1)
Intense positive feelings	Individual differences between the students	1	-	1
Total links of between sub-themes of Entrepreneurial Passion and Individual differences between the students				1
Passion for inventing	Theory versus practice	2	-	2
Total links of between sub-themes of Entrepreneurial Passion and Theory versus practice				2

According to the data from the interviews, "Interaction with the outside world" was the most frequent "Critical learning event" linked to the emergence of "Entrepreneurial passion". Related to the dimensions of passion, this event was only linked to "Passion for inventing", as felt by Informant 4:

"When I work on the development of solutions based on obtained user insight, I actually find it very engaging."

The most frequent link, reported by all informants, is the link between the component "Intense positive feelings" of entrepreneurial passion and the critical learning event "Overcoming knowledge and skill gaps". Informant 4 describe the experience as:

"For one that did not know a lot about entrepreneurship from before, the first feasibility studies were very educational, and the learning curve was steep. It was a good feeling, going from knowing nothing, to actually feel like I know what I was doing."

This link was reported by all informants, and in addition, e.g. Informant 3 state:

"Through my startup, I was able to help others. I love helping others, and to see that I actually was able to do so through my startup was a really good feeling. It made me want to help even more."

All dimensions of entrepreneurial passion are present, but it is mainly the presence of "Passion for inventing" that can be linked to the "Critical learning events". However, the critical learning events "Teamwork experience" and "Time pressure" was linked to obsessive passion by one of the informants. Informant 2 linked the experience of obsessive passion to, e.g. the critical learning event "Teamwork experience":

"I have several times thought about why it did not work with my startup at NSE. I used much time on it, for example, over six months only on expectation clarification. In retrospect, I can see that my passion for the idea draw me not to see that it was not a great team for me to work in."

4.2.4 "Codes that do not fit in"

As mentioned in section [3.4.2.1](#), after placing the data from the interviews in accordance to the different themes, there was still a large amount of data that ended up under the theme "Codes that do not fit in". These codes did not have a suitable place under the themes and sub-themes in (Table 3, Table 4 and Table 5), and did not have a natural place under the overall context. All informants ended up with codes placed in "Codes that do not fit in". The essence of these codes was mainly concerning the informants' experience of working in a startup as a part of their education, and strings of data concerned the internal learning environment. Most frequent of these was the informants' elaboration of the internal learning environment, mainly focusing on the culture at NSE. The culture of the internal learning environment could be linked to positive associations as described by Informant 6:

"NSE gave me the freedom and accept to work my ass off for my startup I got support from the faculty and knowledge from the students in the class above."

As well as negative associations to the internal learning environment as described by Informant 3:

"The students in the year above us was tough on us, on the tip of creating a bully-culture. It made me unsure in, for example, the presentations of the feasibility studies. I felt everyone was better than me, making me feel bad and that I should have known more. Because of the culture at NSE, I felt a lot of pressure and was often tired. But the "written rule" of never being tired, made me feel like I could not tell anyone."

5 Discussion

The quantitative analysis revealed that educational experience has a positive influence on all dimensions of entrepreneurial passion (confirmed in hypothesis 1a, 1b and 1c in section [4.1.1](#)). Additionally, VCP turned out to have a positive moderating effect on the relationship between the component "Social- and networking abilities" of educational experience and "Passion for inventing" and "Passion for developing" (partly confirmed in hypothesis 2a and 2c in section [4.1.2](#)). The quantitative analysis indicated that there exists a relationship between educational experience, entrepreneurial competence (knowledge, skills and abilities) obtained in entrepreneurship education, and entrepreneurial passion. A VCP might seem to have a moderating effect, through facilitating for educational experience related to social-and networking abilities. These results laid the basis for the qualitative case study.

This chapter discusses the findings of both quantitative and qualitative analysis. Consistent with the quantitative findings, the qualitative analysis revealed that passion for inventing was the primary dimension of entrepreneurial passion experienced among the graduates from a VCP. The importance of entrepreneurial passion in a VCP will be discussed in section [5.1](#). Further, "Social- and networking abilities" appeared as the most frequent educational experience obtained in the program, and was one of the educational experiences most linked to entrepreneurial passion. In addition, the qualitative analysis revealed a link between "Judgment ability and decision making" and entrepreneurial passion. The links between educational experience and entrepreneurial passion are discussed in section [5.2](#). The qualitative analysis also revealed links between critical learning events and entrepreneurial passion. Most frequent was the link between "Interaction with the outside world" and "Passion for inventing". How the critical learning events were linked to the graduates' entrepreneurial passion, and the importance of these events in a VCP will be discussed in section [5.3](#).

5.1 Entrepreneurial Passion in a Venture Creation Program

The debate on whether entrepreneurial passion is teachable through entrepreneurship education is present (Gielnik et al., 2015). In the quantitative phase, it was found that educational experience in entrepreneurship education has a positive effect on entrepreneurial passion in retrospect (hypothesis 1a, 1b and 1c in section [4.1.1](#)). This indicates that the entrepreneurial experience the respondents acquired in an entrepreneurship program in general, contributes positively to their experience of entrepreneurial passion. In relation to entrepreneurship literature, the authors argue that this finding supports the entrepreneurship scholars suggestion that entrepreneurial learning contributes to entrepreneurial passion (Dermol, 2010; Idris et al., 2018).

Scholars present the importance of the impact that the entrepreneurial learning process has on entrepreneurial passion (Dermol, 2010; Idris et al., 2018). Entrepreneurship education has been presented as an adequate approach to establish an entrepreneurial learning environment (Idris et al., 2018; Rae & Carswell, 2001). A discussion of how to best organize entrepreneurship education has arised (Samwel Mwasalwiba, 2010), and a shift towards more innovative methods has emerged (Kassean et al., 2015; Rasmussen & Sørheim, 2006). Consequently, more attention towards education which focuses less on

traditional teaching and the use of experiential learning has increased (Fayolle & Gially, 2008; Pittaway & Cope, 2007; Solomon et al., 2008), including more learning-by-doing activities (Rasmussen & Sørheim, 2006). The interest in the field of action-based approaches in entrepreneurship education has resulted in the term venture creation program (Adams, 2016). However, the literature still asks for more research of entrepreneurial passion in a VCP context (Sæter et al., 2018). In the qualitative part of this study, the authors focused on graduates of a VCP. Three of the informants stated a direct link between their entrepreneurial passion and their participation in the program through the qualitative interviews (see section [4.2.1](#)). Their somewhat bold statements might indicate that they have a clear experience of gaining this feeling of entrepreneurial passion through the education and that feeling of entrepreneurial passion might not have been as strong before they participated in the program. However, a few scholars suggest that entrepreneurial passion may increase through entrepreneurship education, e.g. (Gielnik et al., 2015; P. Stenholm & Nielsen, 2019; Pekka Stenholm et al., 2017). Since the faculty of NSE are seeking students that show tendencies of entrepreneurial passion, the findings in the qualitative interviews might instead explain that the graduates' entrepreneurial passion increased through their participation in the VCP.

Further, a few scholars highlight the importance of the learning experience in connection with the development of entrepreneurial passion (Dermol, 2010; P. Stenholm & Nielsen, 2019; Robert J Vallerand, 2008), which you can gain through entrepreneurship education (Gielnik et al., 2015; P. Stenholm & Nielsen, 2019; Pekka Stenholm et al., 2017). A VCP facilitates learning experience through real-life entrepreneurship experiences (M. Lackéus, 2015). According to the qualitative interviews, some of the graduates especially fronted the use of real-life experiences, for example when they had to establish a business, as an important factor for the passion they experience towards entrepreneurship today. The finding promotes the scholars shift towards these more innovative learning-by-doing approaches, focusing more on experiential learning (Fayolle & Gially, 2008; Pittaway & Cope, 2007; Solomon et al., 2008), and indicates that this approach may be related to entrepreneurial passion in a VCP. Since VCPs are different from other entrepreneurship education programs, with the use "*on-going creation of a real-life venture as the primary learning vessel*" (M. Lackéus, 2015, p. 65), it might indicate that the use of these real-life ventures might have an extra impact on their students' learning.

When describing entrepreneurial passion, M. S. Cardon & Kirk (2015) and Murnieks et al. (2014) emphasize the importance of the entrepreneurs' identity and the emotions experienced in the entrepreneurial process. Thus, according to Melissa S. Cardon et al. (2009) theory, "the centrality of entrepreneurial activities for an entrepreneurs' self-identity" is an important component of her definition of entrepreneurial passion. Several of the graduates in the qualitative part of the study linked their entrepreneurial passion gained at NSE to their identity as an entrepreneur (see section [4.2.1](#)). This in line with the goal of VCPs as being "*an enabler in the transformation of students into being entrepreneurs*" (M. Lackéus, 2015, p. 49). The second component of Melissa S. Cardon et al. (2009) definition of entrepreneurial passion is "the experience of intense positive feelings". Findings from the qualitative interviews did show that the informants related the entrepreneurial passion experienced in the VCP to both of these components, which further might emphasize a presence of entrepreneurial passion among students participating in a VCP. The theory of

Melissa S. Cardon et al. (2013) explains how intense positive feelings and identity centrality may be experienced towards different tasks and activities, associated with separate parts of the entrepreneurial process. She, therefore, divided entrepreneurial passion into different dimensions that the entrepreneurs could be passionate about, passion for inventing, founding and developing (Melissa S. Cardon et al., 2009). Collectively, the study group from the qualitative part of the study did show passion for all three dimensions of passion. This is in line with the quantitative results, where hypothesis 1a, 1b, and 1c confirm a positive relationship between entrepreneurial experience and entrepreneurial passion in a general entrepreneurship program. However, when focusing on how a VCP has facilitated this relationship, the findings from hypotheses 2a and 2c in the quantitative analysis, indicated that a VCP mainly facilitates passion for inventing and developing. The hypotheses were only confirmed on a $p < .1$ significance level, indicating a low significance. Moreover, the qualitative analysis was partly consistent and showed that passion for inventing was most frequent, further discussed in the next section.

5.1.1 Passion for inventing in a Venture Creation Program

Of all dimension presented by Melissa S. Cardon et al. (2009), passion for inventing was the one most experienced dimension of passion by all informants in the qualitative part of this study (see section [4.2.1](#)). According to theory, passion for inventing is associated with activities like scanning the environment for new market opportunities (Melissa S. Cardon et al., 2009). People with experiencing this dimension of passion often search for innovative ideas more frequently than other (Katila & Ahuja, 2002), and has a desire to deliver new solutions to the market (Melissa S. Cardon et al., 2009). A big part of the content of the VCP is linked to these kinds of activities. For example, the students undergo the course "Idea search and market assessment" (see Figure 4) where they conduct feasibility studies during the first semester. According to the informants of the qualitative part of the study, their passion for inventing is often related to the feasibility studies conducted during the course "Idea search and market assessment" (see section [4.2.1](#)). The informants link the content of these activities related to passion for inventing, as talking to stakeholders in the search for new market opportunities. Further, passion for inventing is also linked to activities like developing new products or services, and working on new prototypes (Melissa S. Cardon et al., 2009). As the VCP uses real-life ventures as the primary learning vessel (M. Lackeus, 2015), meaning that the students have to establish a startup, the learning vessel of the VCP can be related to entrepreneurial passion for inventing.

The qualitative analysis revealed that passion for inventing in a VCP might evolve to passion for developing later on. In the qualitative analysis, passion for developing was primarily present amongst two of the informants, characterized by the longest time since graduation and which currently works in a startup. These informants mainly described entrepreneurial passion towards activities, including growth and expansion of their company (see section [4.2.1](#)), which is seen as a central part of passion for developing. However, on the other hand, an informant just graduated from the VCP showed negative emotions towards passion for developing (see section [4.2.1](#)). A possible explanation was presented by Informant 6, who had the longest since graduation (see section [4.2.1](#)), where he explained how his passion for inventing might have been facilitated through participation in the VCP, and developed to passion for developing later on. This finding might indicate that participation in a VCP mainly can be related to passion for inventing. As passion for developing is related to growth and expansion of a company after founding

(Melissa S. Cardon et al., 2009, p. 521), it does make sense that this dimension of passion may emerge later on in the entrepreneurial process. Central activities, like finding new customers and employees (Melissa S. Cardon et al., 2013; Melissa S. Cardon et al., 2009), is more linked to companies further down the entrepreneurship line. As the students in the sample VCP first establish their startup at the beginning of the second semester (see Figure 4), they might not have come as far with their venture, making them able to connect to activities related to passion for developing.

According to the interviews of the qualitative part of the study and theory from entrepreneurship literature, the authors can present a clear relation between participation in a VCP and entrepreneurial passion for inventing. These results are emphasized by the quantitative results of this study (confirmation of hypothesis 1a in section [4.1.1](#) and partly confirmation of hypothesis 2a in section [4.1.2](#)). This also results in the first key takeaway of this study - entrepreneurial passion for inventing is related to participation in a VCP.

5.2 The effect of Educational Experience in a Venture Creation Program on Entrepreneurial Passion

As few studies have investigated the effect entrepreneurship education has on the emerge on entrepreneurial passion (Arshad et al., 2018). Therefore, the authors investigate the educational experience acquired and how this is related to entrepreneurial passion. In the quantitative analysis, when solely looking at the link between educational experience (including participants and non-participants) and entrepreneurial passion, all four components of educational experience (see section [2.2.2](#)) were linked to the separate dimensions of entrepreneurial passion (inventing, founding and developing). This indicate that all of Johannisson (1991) learning components presented in the literature is important to consider when assessing entrepreneurial competence obtained in entrepreneurship education (see section [2.2.2](#)). This is aligned with literature stating the importance of acquiring the required competencies in order for students to become entrepreneurs (Fayolle & Gially, 2008).

Additionally, this support G. Hägg (2017) view of the importance of stimulation of different types of competences in order to develop domain-specific knowledge required in entrepreneurship (Alexander et al., 1991). However, when analysing "Venture creation program" as a moderating effect, it was only significant for the relationship between the educational experience component "Social- and networking abilities" and the dimensions of entrepreneurial passion, "Passion for inventing" and "Passion for developing" (confirmed in hypothesis 2a and 2c). An underlying objective of a VCP is to develop student's entrepreneurial competencies (knowledge, skills, and abilities) (M. Lackéus, 2015), but this finding indicates that it is especially the abilities you gain linked to social skills and networking (Johannisson, 1991) in a VCP has a positive influence on entrepreneurial passion for inventing and developing. As discovered in the qualitative analysis, this might be linked to the environment fostered and the "forced" networking during for example feasibility studies in the course "Idea search and market assessment", where the students, for example, have to contact relevant people outside NSE.

Based on the number of occurrences of "Educational experience" that appeared in the qualitative analysis, the entrepreneurial competence (knowledge, skills and abilities) acquired in the program seems to be of great importance for the informants. In the

qualitative analysis, the group of informants "Participants without previous startup experience" before the program had higher occurrences related to educational experience than the group "Participants with previous startup experience". Therefore, it might seem like this group obtained higher educational experience. In line with Kolb's (1984) definition of learning, is the knowledge gained due to transformation of experiences. Therefore, informants with previous startup experience might already have more of the knowledge required to, e.g. establish a new venture in the program (see section [2.2.1](#)), compared to the group without previous startup experience (Box et al., 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). However, the authors found it challenging to capture the presence of entrepreneurial passion based on the informants' elaboration of their educational experience in the qualitative analysis. This might be because the authors focused on the informants' elaboration of their educational experience, trying not to coerce a connection. This resulted in few links to "Entrepreneurial passion" compared to the total number of occurrences in "Educational experience".

Nevertheless, the links present in qualitative analysis are mostly consistent with the result of the quantitative analysis. The component "Social- and networking abilities" was one of the most frequent in the qualitative analysis. Consistent with the key takeaway presented in section [5.1](#), this component is linked to passion for inventing. In addition, this was also present for the component "Judgment ability and decision making", which is not captured in hypothesis 2a (see section [4.1.2](#)). The effect of the components "Social- and networking abilities" and "Judgement ability and decision making" is further discussed in the next section.

5.2.1 Social- and Networking abilities and Entrepreneurial Passion

As presented by Johannisson (1991), social- and networking abilities are known as know-who knowledge, including activities as fostering networks and contacts for entrepreneurial ventures. Further, a few entrepreneurial scholars propose that interaction with real-world actors and peer-learning, which can be seen in relation to social- and networking abilities, can enhance the students entrepreneurial learning process (G. Hägg, 2017; Kassean et al., 2015; Aadland & Haneberg, 2019). The quantitative analysis in this study presented a positive relationship between "Social- and networking abilities" and the entrepreneurial passion dimensions, "Passion for inventing" and «Passion for developing», moderated by VCP (confirmed in hypothesis 2a in 2c). When further investigating this result in the qualitative analysis, "Social- and networking abilities" came out as the most frequent variable of educational experience, experienced by all six informants. Prior research has found that students of an action-based entrepreneurship education learn from each other when they are a part of a venturing community, involving new venture creation (D. Haneberg & Aadland, 2019). The results from the qualitative analysis emphasize this research because the informants of the qualitative study present the culture and environment from their education at NSE as especially important for their entrepreneurial learning gained through the program (see section [4.2.1](#)). This is also consistent with the statement of Johannisson (1991) emphasizing that social- and networking abilities are important when educating student entrepreneurs.

The results of the quantitative and qualitative analysis were consistent, both presenting a relation between the educational experience of social- and networking abilities in a VCP

and entrepreneurial passion for inventing. In relation to the discussion in section [5.1](#), it might indicate that the social- and networking abilities the graduates of NSE gain through for example contacting relevant stakeholders through the feasibility studies in the course "Idea search and market assessment" has a positive impact on their experience of passion for inventing. As passion for inventing include, for example, search for new market opportunities (Melissa S. Cardon et al., 2009), contacting relevant entrepreneurial ventures (Johannisson, 1991) might be of the essence. This is in line with previous research connecting the entrepreneurial learning process and entrepreneurial passion (Dermol, 2010).

5.2.2 Judgement ability and Decision making and Entrepreneurial Passion

When further investigating how the educational experience in a VCP may be linked to entrepreneurial passion, "Judgment ability and decision making" appeared as the component of educational experience with the most links to entrepreneurial passion according to the qualitative analysis (see section [4.2.1.1](#)). Judgment ability and decision making are related to the students' ability to regulate acquired entrepreneurial knowledge and skills when engaging in the entrepreneurial process (Alexander et al., 1991). This means that students know when to act intuitively based on entrepreneurial experiences, and knowing why to make decisions on how to act under uncertain conditions (G. Hägg, 2017). This component of educational experienced among almost all of the informants in the qualitative part of the study, and is highlighted as an important ability when coping with decision making under uncertain condition (Johannisson, 1991). Consistent with the key takeaway presented in section [5.1](#), "Judgment ability and decision making" was only linked to the entrepreneurial passion dimension, "Passion for inventing" in the qualitative analysis. This emphasizes that participation in a VCP might have several links to the development of passion for inventing. The component turned out to be an important learning component for several informants in the qualitative part of the study in relation to their experience of passion for inventing. E.g. as presented in section [4.2.1](#) and section [4.2.1.1](#), when the informants search for new market opportunities, the ability to take initial decisions based on judgment when facing ambiguity and uncertainty in the new venture creation process (Knight, 1921; Politis, 2008; Sarasvathy, 2001) was important.

Even though participation in a VCP did not seem to have a moderating effect on this relationship in the quantitative analysis, the qualitative analysis revealed the importance of "Judgement ability and decision making" in relation to entrepreneurial passion. It, therefore, seems like the graduates from this program has learned what knowledge they have gained during the program and how to use it, which will prepare the students for ambiguity and uncertainty in entrepreneurial processes (Alexander et al., 1991; G. Hägg, 2017; Knight, 1921; Politis, 2008; Sarasvathy, 2001).

Scholars have confirmed a positive relationship between entrepreneurial passion and both entrepreneurial experience e.g. (P. Stenholm & Nielsen, 2019; Robert J Vallerand, 2008) and entrepreneurial learning process e.g. (Dermol, 2010). In this study, the quantitative analysis highlighted "Social- and networking abilities" as significant for the development of entrepreneurial passion in a VCP. This is not studied much in entrepreneurship literature, but a few scholars have highlighted the importance of social- and networking abilities for students in entrepreneurship education (G. Hägg, 2017; Kassean et al., 2015;

Aadland & Haneberg, 2019). This was consistent in qualitative analysis, besides including the importance of "Judgement ability and decision making". This is aligned with entrepreneurship literature, presenting the importance of the learning experience as a basis for the development of passion (Robert J Vallerand, 2008). Additionally, consistent with the key takeaway presented in section [5.1](#), correlating results of both the qualitative and quantitative analysis indicated that the presented educational experiences in a VCP only might be linked to entrepreneurial passion dimension, passion for inventing.

5.3 Critical Learning Events and Entrepreneurial Passion

As described in section [2.3.2](#), significant "events" or "episodes" might influence the entrepreneurial learning process experienced in an entrepreneurship education (Cope & Watts, 2000; Deakins & Freel, 1998; Rae & Carswell, 2001), known as "critical learning events". Martin Lackeus (2014) has been able to present a link between the critical learning events – "Interaction with the outside world" and "Teamwork experience" with entrepreneurial passion in a VCP. However, since entrepreneurial passion was not of primary interest, the authors investigated this link further in the qualitative part of this study. The findings in this study also indicated a link between critical learning events and educational experience. This was not the primary focus of this study but appeared naturally from the qualitative interviews. Thus, these links will be discussed firstly in this part, followed by the link between critical learning events and entrepreneurial passion.

5.3.1 The link between Critical Learning Events and Educational Experience

In addition to claiming that students learn experientially through the new venture creation process, the researchers started to investigate in which situations students learn (Corbett, 2005). Scholars asked for a better understanding of how entrepreneurs learn from formate experiences (Reuber & Fischer, 1993). A shift was therefore put towards Cope (2005) Dynamic Learning Perspective of entrepreneurship (Pittaway & Thorpe, 2012). Cope & Watts (2000) has pioneered research on and demonstrated how learning and adaptation are stimulated through distinct critical learning events. In this study, the relationship between these critical learning events and the educational experience in a VCP was not the main focus. However, some links occurred during the qualitative interviews. This was most present for the group "Participants without prior startup experience" (see section [4.2.2](#)). In the VCP, it was the components of educational experience – "Social- and networking abilities" and "Teamwork abilities" that had the most links to different critical learning events. Both of these components measure different aspects of know-who competence (see section [3.3.1.2](#)). This indicates that critical learning events experienced in a VCP have the most impact on entrepreneurial competence (knowledge, skills and abilities) gained related developing social- and networking abilities (Gustav Hägg & Politis, 2015; Radu Lefebvre & Redien-Collot, 2013), as well as learning from others, resulting in the development of collaborative abilities and commutative skills (Sharan, 2015; Topping, 2005).

The most frequent link amongst the informants, between "Educational experience" and "Critical learning event", was the link between the component "Social- and networking abilities" and the event "Interaction with the outside world". This indicates that interaction with people outside the learning environment in a VCP can improve your social-and

networking abilities subsequently. This is consistent with the theory highlighting the positive impact of using the entrepreneurial network and social communities (Cope, 2005; Hines & Thorpe, 1995; Mäkinen, 2002) for the entrepreneurial learning process. The informants in the qualitative interviews emphasize social- and networking abilities as one of the most important abilities from their time at NSE, often in connection with cold calling during, e.g. in the course "Idea search and market assessment" (see section [4.2.2](#)). Therefore, based on the qualitative analysis, it seems like critical learning events are present in relation to the educational experience acquired in a VCP. This finding emphasizes the statements of Cope (2005), arguing that these critical learning events are important for the acquired entrepreneurial experience.

5.3.2 The link between Critical Learning Events and Entrepreneurial passion

As these critical learning events is seen as important for the entrepreneurial experience (Cope, 2005), and has a significant role in the entrepreneurial learning process (Deakins & Freel, 1998; Pittaway & Thorpe, 2012; Rae & Carswell, 2001), it can be argued that these event might have an important role in connection with entrepreneurial passion (Cope, 2005; Dermol, 2010; P. Stenholm & Nielsen, 2019; Robert J Vallerand, 2008). As mentioned, Lackéus (2014) has been able to present a link between the critical learning events – "Interaction with the outside world" and "Teamwork experience" with entrepreneurial passion in a VCP. However, entrepreneurial passion was not of primary interest in Lackéus (2014) work. In this study, the authors were able to uncover a total of 38 strings of data, connecting "Critical learning events" to "Entrepreneurial passion". Just about all the critical learning events uncovered in the qualitative data can be linked to entrepreneurial passion. The critical learning events in a VCP which were most frequent in relation to entrepreneurial passion were the events "Interaction with the outside world", "Teamwork experience" and "Knowledge and skills" (see Table 23). This is mostly consistent with the findings of Lackéus (2014) research.

"Interaction with the outside world" was one of the most frequent critical learning event linked to the emergence of entrepreneurial passion, further elaborated in section [5.3.2.1](#). "Teamwork experience" was also a frequent critical learning event in relation to entrepreneurial passion in this study, consistent with the findings of Lackeus (2013). As expressed by Informant 6 (see section [4.2.3](#)), he includes the teamwork experience during the feasibility studies as an important source to his educational experience and entrepreneurial passion. This is consistent with the component "Teamwork abilities" being positively related to entrepreneurial passion in entrepreneurship education, confirmed in hypothesis 1a, 1b and 1c (see section [4.1.1](#)) of the quantitative part of the study. Learning from others in a team-based setting develops collaborative abilities and commutative skills (Harms, 2015; S. Mueller & Anderson, 2014; Pittaway & Cope, 2007), which is seen as important in an entrepreneurship education (Sharan, 2015; Topping, 2005). In addition to the feasibility studies, the teamwork experience in the student's ventures also turned out as an important factor in this critical learning event, based on the qualitative interviews. This is consistent with the relation to "Teamwork abilities" presented, which includes the importance of learning from others in a team-based setting (Harms, 2015; S. Mueller & Anderson, 2014; Pittaway & Cope, 2007). The critical learning event "Teamwork experience" is mainly expressed in relation to entrepreneurial passion when the informants talk about their participation in either a feasibility study or when working in their selected

team for their new venture. This might indicate that there are mainly these two situations facilitating for the connection to entrepreneurial passion in this critical learning event.

The findings have contained mainly intense positive feelings mostly related to R. J. Vallerand et al. (2003) harmonious passion. On the other, there exist another aspect of passion – obsessive passion. Obsessive passion was not the main focus of this study but appeared prominent in this interview. In this study, the authors also uncovered a link between the critical learning events and obsessive passion. Among one of the informants in the qualitative interviews, “Teamwork experience” was connected to “Obsessive passion”. She linked, e.g. “Teamwork experience” to the experience of pressure from for example the team in her new venture, forcing her to continue the work she enjoyed, but on behalf of for example rest and her mental health. In line with the definition of obsessive passion (R. J. Vallerand et al., 2003), she continued the entrepreneurial activities she enjoyed, even though it influenced her life negatively. This could be further studied.

Being able to develop factual knowledge and skills related to the new venture in an educational setting (Alexander et al., 1991; Johannisson, 1991; P. D. Reynolds, 1997) is shown to be important in the learning process (Shepherd et al., 2000; Starr & Fondas, 1992; Stinchcombe, 1965). In this study, all informants expressed educational experience in the form of knowledge and skills in the entrepreneurial process, captured in the critical learning event “Overcoming knowledge and skill gaps”. This event turned out to be the most frequent critical learning event linked to the component “Intense positive feelings” of “Entrepreneurial passion”, experienced by all informants of the qualitative study. These learning events covers situations where the informants were able to overcome knowledge and skill gaps, due to, for example, lack of prior knowledge or experience (Arpiainen et al., 2013). The informants describe this as important for their confidence in their work during their participation in the VCP. As Informant 3 stated in her interview (see section [4.2.3.1](#)), was overcoming these gaps important for her confidence in the startup she started with her team during her participation in the VCP. It resulted in her investing more time and energy into the activity (emphasizing research of, e.g. (Melissa S. Cardon et al., 2009)). This is consistent with the component “Knowledge and skills” being positively related to entrepreneurial passion in entrepreneurship education, confirmed in hypothesis 1a, 1b, and 1c (presented in section [4.1.1](#)) in the quantitative part of the study.

All dimensions of entrepreneurial passion were present, but mainly “Passion for inventing” that was connected to the critical learning events. This is consistent with the key takeaway in section [5.1](#) that participation in a VCP is related to passion for inventing. For example, one of the most frequent critical learning event “Interaction with the outside world” was only linked to “Passion for inventing”. This link is further elaborated in the section below.

5.3.2.1 “Interaction with the outside world” and Passion for inventing

In this study, the critical learning event “Interaction with the outside world” was the most frequent critical learning event linked to the emergence of entrepreneurial passion (see section [4.2.3.1](#)). This is consistent with the findings of Lackeus (2014). “Interaction with the outside world” is linked to events where the students of the VCP, for example, talk to potential customers or relevant stakeholders for their ventures (Arpiainen et al., 2013). According to the informants of the qualitative part of the study, the VCP facilitates the interaction with important entrepreneurial stakeholders outside the internal learning

environment. Several of the informants categorized the feasibility studies during the course "Idea search and market assessment" as one of the important situations facilitating for the critical learning event "Interaction with the outside world". Besides, several informants stated that the networks established during the VCP have been important in the entrepreneurial process, also after graduation. As argued previously in this chapter, a second key takeaway is the importance of social- and networking activities experienced by students during the participation in the program.

When connecting this critical learning event to entrepreneurial passion (see section [4.2.3.1](#)), the way of connecting the task experienced in relation to "Interacting with the outside world" to something the informants enjoyed doing stood out. This can be seen in strong connection with entrepreneurial scholars explain the presence of passion as the entrepreneurs' capability to view the venture as something they enjoy doing, rather than "work" or "tasks" (Baum et al., 2001; Melissa S. Cardon et al., 2009; R. J. Vallerand et al., 2003). The authors, therefore, argue for an evident connection between this critical learning event and entrepreneurial passion. More specifically, the entrepreneurial dimension of passion, "Passion for inventing", as the informants in this study mainly connected their passion to activities associated with this dimension. Consistent with the theory on passion for inventing (Melissa S. Cardon et al., 2009), the informants mainly connected the critical learning event and dimension of passion through activities as obtain user insight and making new prototypes.

This is consistent with the key takeaway presented in section [5.1](#), that participation in a VCP seems to be related to passion for inventing. For three of the most frequent critical learning events "Interaction with the outside world", "Teamwork experience" and "Knowledge and skills", the feasibility studies experienced in the course "Idea search and market assessment", turned out to be one of the main facilitators for these events in relation to the entrepreneurial passion. This indicates that the VCP could be an important factor for the emergence of this dimension of passion. Therefore, the authors argue that this means that the presence of critical learning events in a VCP and uncovering these may be essential for facilitating entrepreneurial passion among students in such program.

5.3.3 The importance of Previous Startup Experience in the Critical Learning Event "Individual differences between students"

When analysing critical learning events in the qualitative part of the study, the event "Individual differences between students" was the most frequently experienced event (see section [4.2.3](#)). However, this critical learning event had few connections to entrepreneurial passion (see Table 23). "Individual differences between students" are linked to events where the students experience the impact of, for example, the different background and prior knowledge or experience between the students of a program (Arpiainen et al., 2013). In the qualitative part of this study, the critical learning events were most frequent among the group "Participants with previous startup experience". When investigating the event, the authors found it to mainly be linked to different aspects of the informants' previous entrepreneurial experience. The most frequent aspects of data related to "Individual differences between students" mostly included their previous startup experience, existing network (friends and family) and prior educational background. This is in line with literature stating that students may have different prior experience, background and

underlying motivation, which can influence the students entrepreneurial learning process (Zainuddin et al., 2019).

In line with the discussion in section [5.2](#), it seems like the group "Participants without previous startup experience" obtained higher educational experience in NSE. Since differences between the groups were also highlighted in the critical learning event "Individual differences between students", it seems like the informants with previous startup experience might already have more of the knowledge required to, e.g. establish a new venture in the program (see section [2.2.1](#)), compared to the group without previous startup experience (Box et al., 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). This can be seen in connection to the results from the in-depth interviews related to this critical learning event, where all of these informants most frequently mentioned previous startup experience. This is in line with entrepreneurship literature, stating that previous startup experience might influence the entrepreneurial learning process (Box et al., 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). This might indicate that the prior experience the informants in this group brought into their participation in the VCP influenced their entrepreneurial learning in the program. Further, it indicates the importance of including prior startup experience when investigating the entrepreneurial learning process in a VCP.

Control variables are taken into account in the quantitative analysis, trying to capture individual differences that can influence an entrepreneur's entrepreneurial passion. Consistent with the finding in the event "Individual differences between students" in the qualitative analysis, the control variable "Entrepreneurs in family or friends" stood out, since it was significant for both "Passion for inventing" and "Passion for developing" in hypothesis 1a and 1c (see section [4.1.1](#)). In the qualitative analysis, the informants previous network was frequently mentioned, turning out to be mainly friends and family. Previous research has pointed out the role of prior entrepreneurial experience and knowledge as essential for entrepreneurial learning (Box et al., 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). The authors also uncovered prior educational background, including both entrepreneurial and other types of education, as important in the event. This was mainly referring to the entrepreneurial competence (knowledge, skills and abilities) gained. However, it indicates how educational experience is linked to the way entrepreneurs perceive new situations (Cope, 2005), and that it is essential to consider the knowledge and skills gained before for example participation in a VCP.

5.4 "Codes that do not fit in"

As mentioned in section [3.4.2.1](#), after placing the qualitative data from the interviews in accordance to the different themes, there was still a large amount of data that ended up under the theme "Codes that do not fit in". As all informants ended up with codes within this theme, which to some degree included similar content, and the authors argue that it is important to discuss these findings.

The main essence of these codes was related to critical learning events because the informants elaborated about events they found important for their learning (Cope & Watts, 2000; Deakins & Freel, 1998; Rae & Carswell, 2001) when participating in the VCP. As an overall context, these codes were mainly in relation to the informants' experience of working in a startup as a part of their education and strings of data in relation to the internal learning environment. Most frequent of these was the informants' elaboration of

the internal learning environment, mainly focusing on the culture at NSE. For this event, the informants, for example, emphasized the importance of the faculty, culture at NSE and alumni network for their entrepreneurial learning. It emphasized the literatures' statement saying that this critical learning event is experienced as influential, effective and meaningful for the entrepreneurs learning process, and is important for the entrepreneurial experience obtained (Cope, 2005). In this case, it means that the internal learning environment and culture has been essential for the educational experience obtained of all the informants at NSE. Recent literature on entrepreneurial learning has a growing focus on emotions (Arpiainen et al., 2013) and group dynamic (Pittaway & Cope, 2007), which is important factors in the extension of critical learning events (Cope, 2003, 2005; M. Lackéus, 2015). However, as presented one of the informants also experienced negative emotions due to the internal learning environment at NSE (see section [4.2.3](#)), which might lead to obsessive passion.

As described by Cope (2005), the critical learning events somewhat “metaphorical” and little researched, resulting in few concrete definitions. This might be an explanation of why the authors ended up with a large amount of data they were not able to place under the existing theory-driven codes. From the theme “Codes that do not fit in”, the authors found a broad number of aspects that may be seen in relation to critical learning events. For further research on critical learning events, the authors, therefore, argue that a better categorization and dilution of more concrete critical learning events should be done. In addition, from the codes that did not fit in within the existing theory-driven coding framework (see section [3.4.2.1](#)), the authors especially found the internal learning environment and culture in a VCP to be an important factor among the graduates. This is in line with the research of (Lackeus, 2013), stating that a VCP is a suitable environment for studying emotions in relation to entrepreneurial education. The authors argue that this could be included in further research.

6 Conclusion

The purpose of the study was to "*investigate how educational experiences in a venture creation program relates to entrepreneurial passion*". This was done by applying a mixed method approach, combining both quantitative and qualitative research methods (Creswell & Clark, 2007). Entrepreneurial passion is little studied in an entrepreneurship education context (Arshad et al., 2018), and the literature asks for further studies on how entrepreneurial passion emerge (Murnieks et al., 2014). However, a few scholars also indicate a connection between the entrepreneurial learning a student gain through participation in an entrepreneurship education program and the emerge of entrepreneurial passion, e.g. (Idris et al., 2018; Robert J Vallerand, 2008; Zainuddin et al., 2019). Therefore, a quantitative approach, using an existing cross-sectional study, was applied in order to investigate the relationship between educational experience and entrepreneurial passion in a VCP (Ringdal, 2014).

In the quantitative analysis, the authors investigated if educational experience was related to the different dimensions of entrepreneurial passion – inventing, founding and developing. These hypotheses were confirmed, revealing that educational experience has a positive influence on all dimension of entrepreneurial passion. In comprehending "how" entrepreneurs learn, there has been a shift towards a common recognition that entrepreneurs are action-oriented and much of their learning is experimentally based (Rae & Carswell, 2001). The interest in the field of action-based approaches in entrepreneurship education has resulted in the term venture creation program (Adams, 2016), which is seen as the extreme of the action-oriented approaches (Donnellon et al., 2014). There is a growing trend of adopting this approach in entrepreneurial education, e.g. (M. Lackéus, 2015; Lockyer & Adams, 2014), which has resulted in the request of more research on the context of VCPs (Støren et al., 2015; Sæter et al., 2018). Further, the literature highlights entrepreneurial passion as an important construct in the entrepreneurial process (Melissa S. Cardon et al., 2009), which is the primary learning vessel in a VCP (M. Lackéus, 2015). Therefore, the authors investigated if participation in a VCP moderates the relationship between educational experience and the emergence of entrepreneurial passion. A relation was confirmed in hypothesis 2a and 2c between the component "Social- and networking abilities" of educational experience and "Passion for inventing" and "Passion for developing".

Summarized, the quantitative analysis indicates that there exists a relationship between educational experience acquired in entrepreneurship education and entrepreneurial passion. A VCP might seem to have a moderating effect, however, only through facilitating for educational experience related to social- and networking abilities. In order to provide a deeper understanding of such a relationship (Arora & Stoner, 2009), a qualitative method was applied, and the results from the quantitative analysis laid a basis for the conduction of the qualitative case study.

In the qualitative analysis, the authors investigated more in-depth on how educational experience relates to entrepreneurial passion in a VCP. The qualitative analysis revealed that passion for inventing was the main dimension of entrepreneurial passion experienced among the graduates from a VCP, which is the first key takeaway in this study. This might be because a large part of the content in such program can be linked to activities facilitating for passion for inventing, e.g. feasibility studies and new venture creation as

the primary learning vessel (M. Lackeus, 2015). When investigating in-depth which components of educational experience which were related to entrepreneurial passion, "Social- and networking abilities" and "Judgement ability and decision making" appeared prominent. This is consistent with quantitative findings, where "Social- and networking abilities" appeared as an important educational experience linked to entrepreneurial passion. This support the scholars findings, confirming a positive relationship between entrepreneurial passion and both entrepreneurial experience e.g. (P. Stenholm & Nielsen, 2019; Robert J Vallerand, 2008) and entrepreneurial learning process e.g (Cope, 2005; Dermol, 2010). However, the qualitative analysis revealed more in-depth in which situations the educational experience occurred. This resulted in links between informants educational experience and critical learning events, which was not the main focus of this thesis.

In addition, to claim that students learn experientially through the new venture creation process, extent research has started to investigate in which situations student learn (Corbett, 2005). Cope (2000) demonstrated how learning and adaptation are stimulated through discontinuities or events (Kolb, 1984), known as "critical learning events". Cope (2003) state that these events have *"a prominent role to play in how entrepreneurs learn"* (p.436). There is little research on these critical learning events, but Lackeus (2014) has presented an indirect link between critical learning events in a VCP and entrepreneurial passion. Therefore, the authors further investigated how critical learning events are related to entrepreneurial passion, in the qualitative analysis, by the following research question: *"How does critical learning events relate to entrepreneurial passion among graduates that participated in a Venture Creation Program?"*. Answering this research question, the authors found that critical learning events are related to graduates entrepreneurial passion, mainly through three events adapted from Lackeus (2014). These events were "Interaction with the outside world", "Teamwork experience" and "Knowledge and skills". Consistent with the key finding that a VCP might be related to the passion for inventing – the critical learning events were mostly related to passion for inventing. The appearance of critical learning events related to entrepreneurial passion, mainly occurred during social- and networking activities, for example when cold calling during feasibility studies or working with the teams in the new ventures. The critical learning events mainly linked to know-who competence of educational experience, indicating that critical learning events experienced in a VCP have the most impact on entrepreneurial competence (knowledge, skills and abilities) acquired related developing social- and networking abilities (Gustav Hägg & Politis, 2015; Radu Lefebvre & Redien-Collot, 2013), as well as learning from others, resulting in the development of collaborative abilities and commutative skills (Sharan, 2015; Topping, 2005). This means that when investigating educational experience and critical learning events in relation to entrepreneurial passion in a VCP, the analysis revealed the importance of interacting with different entrepreneurial networks. The informants in the qualitative interviews emphasize social- and networking abilities as one of the most important abilities from their time at NSE, often in connection with cold calling during, e.g. the course "Idea search and market assessment" (see section [4.2.2](#)). This resulted in the second key takeaway in this study – in a VCP there exist critical learning events and educational experience acquired which positively influence graduates entrepreneurial passion, mainly through social- and networking activities. Therefore, the authors argue that this means that the presence of critical learning events in a VCP and uncovering these may be essential for facilitating the entrepreneurial passion among graduates in such program.

6.1 Contribution and implications

The study contributes to the research on the emergence of entrepreneurial passion, asked for by several scholars, e.g. (Melissa S. Cardon et al., 2017; Murnieks et al., 2018; P. Stenholm & Nielsen, 2019). This is done by investigating how entrepreneurial passion relates to the educational experience in a VCP. Secondly, the study contributes to entrepreneurship education literature. It is important to understand the effect of such entrepreneurship program in order to find out how to design these programs since the best practice is currently not agreed upon (Rasmussen & Sørheim, 2006). Due to systematics and cost-based challenges, action-based programs are more infrequent than traditional programs. Thus, it is important to understand the effect of such programs in order to ensure resources are used in an appropriate way (Lackeus, 2013). This is done by investigating the educational experience obtained by graduates in a VCP. Thirdly, the authors contribute to filling the gap of research on entrepreneurial passion in VCPs (Sæter et al., 2018), by investigating the relationship between educational experience and entrepreneurial passion in a VCP setting. This may strengthen the role of entrepreneurial passion as an important variable to be accounted for in future entrepreneurial programs. Lastly, the study incorporates the concept of "critical learning events" in a VCP and how these events are related to the emergence of entrepreneurial passion (Cope, 2005). Consistent with the little research on such events, this study has followed Lackeus (2014) work on empirically confirming some aspects of Cope's framework for entrepreneurial learning stating that critical learning events are central to how people become entrepreneurial (Pittaway & Thorpe, 2012).

For practitioners, the findings imply that in venture creation programs should be organized in a way that students can establish relationships and interact with different entrepreneurial networks in order to facilitate entrepreneurial passion. From this study, the feasibility studies were specially highlighted. As the feasibility studies were only present in one course of the venture creation program, the program could organize opportunities for establishing relationships and interacting with different entrepreneurial networks throughout the program.

6.2 Limitations and Further research

This chapter presents the limitations of the study, followed by possible areas of further research. The sample of the study consists of students applied for and interviewed for a VCP in Norway, it is not possible to generalize the results to an arbitrary student, but to students applied and participating in a similar VCP. Since there are several ways of designing such programs (Aadland & Aaboen, 2018), it is uncertain which others venture creation programs than NSE these results can be generalized to. In the quantitative analysis, the authors discarded the control variable «Age When Applying» due to fewer observations than the other control variables. This variable should be included in further studies.

Another limitation of the study is related to the qualitative data analysis. Sometimes, the informants found it challenging to elaborate about their educational experience in retrospect. The informants expressed that it was easier to remember concrete events than the entrepreneurial competence gained in the program. This might be because the critical learning events are experienced as influential, effective and meaningful for entrepreneurs

learning process in retrospect (Cope, 2003, 2005). The interview guide was designed with open questions and was not narrowed down into the components of educational experience and concrete critical learning events. In retrospect, the authors would have included more specific questions on educational experience in order to capture more data.

Additionally, in the qualitative analysis, it was sometimes difficult for the authors to capture the difference between the entrepreneurial passion that emerged during the informants' participation in the VCP, from the entrepreneurial passion the informants entered the program with. This is in line with the literature stating that it is difficult to assess the effects of entrepreneurial education, and thus to prove that it is the venture creation program itself that causes the selective outcome, e.g. Martin Lackéus (2014) and M. Lackéus (2015). Another important limitation is that the authors of this thesis graduated from NSE, which is the VCP investigated in this thesis. This means that the authors have a strong insight into the program, which can influence the authors' interpretation of the data.

Besides the limitations presented, the authors found several other areas possible for further research. However, there were mainly three findings that stood out which the authors will present. Firstly, the authors have found that this study indicates that educational experience obtained and critical learning events experienced in the VCP is related to passion for inventing. However, since the authors focused on Melissa S. Cardon et al. (2009) dimensions of passion, further research should consider R. J. Vallerand et al. (2003) Dualistic Model– consisting of obsessive- and harmonious passion. This is because when investigating how critical learning events were related to entrepreneurial passion, some events appeared to be related to graduates obsessive passion (see section [5.3.2](#)) The authors focused on Melissa S. Cardon et al. (2009) dimensions of entrepreneurial passion, and not the emergence of obsessive passion. Therefore, future work could investigate if and how such critical learning events in a VCP could lead to obsessive passion.

Secondly, the most frequent critical learning event "Individual differences between students", adapted from Lackeus (2014), was found to be most frequent among the group "Participants with previous startup experience". The data related to this event were mainly linked to different aspects of the informants' previous entrepreneurial experience, e.g. previous startup experience. Individual differences between the informants were also emphasized in the quantitative analysis by the control variables presented in section [3.3.1.4](#). It seemed like the group without previous startup experience had higher occurrences related to educational experience, indicating that this group obtained higher educational experience. Therefore, informants with previous startup experience might already have more of the knowledge required to, e.g. establish a new venture in the program, compared to the group without previous startup experience (Box et al., 1994; Lamont, 1972; Ronstadt, 1988; Sapienza & Grimm, 1997). In line with previous literature (Cope, 2005; Politis, 2005; Zainuddin et al., 2019), the authors emphasize the importance of including prior experiences in further research when studying the effect of a VCP.

Thirdly, in the qualitative analysis, some codes did not have a suitable place under the themes and sub-themes in the coding frameworks and did not have a natural place under the overall context. The essence of these codes was mainly related to the internal environment and culture in the VCP. Even though these codes did not fit in under the theory-driven framework (see section [3.4.2](#)), the informants used the data to describe

meaningful and influential events for their participation in the VCP in retrospect. Since the theory states that critical learning events are situations that entrepreneurs experience as influential, effective, and meaningful for their learning process in retrospect (Cope, 2003, 2005). The authors, therefore, argue that further research should take the internal learning environment and culture into account when investigating critical learning events in a VCP.

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Attachment 1

Attachment 1: NSD - Norwegian Centre of Research Data's review of use of personal data in the thesis.

NSD sin vurdering

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Prosjekttittel

Relationship between Entrepreneurial Learning Events and Entrepreneurial Passion in a Venture Creation Program

Referansenummer

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Registrert

30.03.2020 av Helena Koch Haugane - helenakh@stud.ntnu.no

Behandlingsansvarlig institusjon

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Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Torgeir Aadland , torgeir.aadland@ntnu.no, tlf: 95773628

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Kontaktinformasjon, student

Helena Koch Haugane, helenakh@stud.ntnu.no, tlf: 90111216

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27.03.2020 - 31.12.2020

Status

03.04.2020 - Vurdert

Vurdering (1)

03.04.2020 - Vurdert

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 03.04.2020, samt i meldingsdialogen innmelder og NSD.

Behandlingen kan starte.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde:

https://nsd.no/personvernombud/meld_prosjekt/meld_endringer.html

Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 31.12.2020.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet leter om et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som dokumenteres, og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrerte samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER

NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål og ikke behandles til nye, uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: åpenhet (art. 12), informasjon (art. 13), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 13.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen

FØLG DIN INSTITUSJONS RETNINGSLINJER

NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1 f) og sikkerhet (art. 32).

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET

NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Attachment 2

Attachment 2: Interview guide designed to in-depth interviews in qualitative analysis.

Interview guide

Introduction

1. Describe the purpose of the study
2. Privacy (the interview is held within the master group and anonymized unless otherwise requested)
3. Promote the opportunity to contact at a later date if there are any questions

Introduction Questions

1. Age, gender
2. Relationship
3. Current job situation
4. Years since ended a study
5. Participation in startup (number and type)
6. Years since joining the startup
7. Previous entrepreneurial experience
8. Entrepreneurial network

Entrepreneurial learning before participation in a VCP

1. **What kind of education and work experience did you have before joining NSE?**
 - a. Why did you choose this direction?
 - b. Name three things you learned most from?
- i. How has this experience contributed further?
 2. **Describe situations before you started your education at NSE where you experienced that you learned something about entrepreneurship**
 - . What did you learn?
 - a. How did you use this learning at a later date?
 3. In what situations do you experience that you work with entrepreneurship?
 - . What motivates you?
 - a. What do you learn?

Entrepreneurial learning in a VCP

1. **Briefly describe the education you received at NSE**
 - a. What knowledge and characteristics did you gain from the education received?
 - b. What knowledge and attributes have proved to be most useful? Why?
 - c. How did you acquire this knowledge and characteristics?
2. **Name three moments that you perceive have been most important for you to develop as an entrepreneur during your two years at NSE. Briefly explain why these three are so important**
3. What/who has had the most impact on the development of your project during your time at NSE?
 - . Why this/these?
 - a. What did they give you?
 - b. In what situations did this happen?
4. **Are there any situations/areas that you have learned more from in your study program? For example, select three situations that the subject explains in-depth**
 - . What did you learn from these situations? Why?

- a. Why do you remember these situations as something you learned from?

Entrepreneurial passion when participating in a VCP

- 1. Why do you want to work with entrepreneurship?**
 - a. What makes you want to work with entrepreneurship? And where does the lust come from?
- 2. How would you describe the feeling you get when working with entrepreneurship?**
 - . Do you only get this feeling when working with entrepreneurship or in other settings as well?
 - a. Is this feeling constant or does it change?
- 3. Describe what it was like to work in a startup during your time at NSE**
 - . What was the best?
 - a. What was the worst?
 - b. What motivated you?
 - c. What role did you take?
 - d. What did you learn?
- 4. When you work with entrepreneurship, what role do you prefer to have?**
 - . Why?
 - a. What does it give you/what do you learn?
- 5. Name three situations during your time at NSE that you experienced as particularly positive and educational**
 - . What triggered this?
 - a. What happened, what did you learn, what was the outcome?
 - b. Did you experience this often during your participation in NSE?
- 6. Name three situations during your time at NSE where you experienced continuing an entrepreneurial activity you enjoyed despite having negative consequences**
 - . What triggered this?
 - a. What happened, what did you learn, what was the outcome?
 - b. Did you experience this often during your participation in ES?

Include if it has not been mentioned before

Normally, one can say that one divides passion for entrepreneurship into three different dimensions, passion for inventing, finding, and developing.

Inventing

1. Describe your relationship to
 - a. Search for problems and needs in the market
 - b. Create a new solution
2. Are there any situations/areas that you have learned more from in your study program? For example, select three situations that the subject explains in-depth
 - . What did you learn from these situations? Why? Why do you remember these situations as something you learned from?
3. How would you relate this to what you learned at NSE?
4. How would you relate this to past experiences?

Founding

1. Describe your relationship to:
 - a. Start a new company
 - b. Provide necessary financial, human and social resources
2. Are there any situations/areas that you have learned more from in your study program? For example, select three situations that the subject explains in-depth
 - . What did you learn from these situations? Why? Why do you remember these situations as something you learned from?

3. How would you relate this to what you learned at NSE?
4. How would you relate this to past experiences?

Development

1. Describe your relationship to:
 - a. Contribute to growth and expansion after establishing a company
 - b. Daily chores in a business
2. Are there any situations/areas that you have learned more from in your study program? For example, select three situations that the subject explains in-depth
 - . What did you learn from these situations? Why? Why do you remember these situations as something you learned from?
3. How would you relate this to what you learned at ES?
4. How would you relate this to past experiences?

Entrepreneurial passion after graduating from a VCP

1. **Describe your dream job after graduation**
 - a. Does that include entrepreneurship?
 - b. What role do you prefer to have?
2. **Describe the importance for you of working with entrepreneurship**
 - . Has it become part of everyday life?
3. Describe your situation as it is today
 - . What drives you to do entrepreneurship?
- a. What factors could have caused you to stop working with entrepreneurship?
4. Is working in a startup essential for you to say you work with entrepreneurship?
 - . Why/why not?

The impact of education on the current situation

1. **Has the education you received at NSE been useful or useless in the context of your current situation?**
 - a. If it has been useful, how? (What knowledge and attributes do you use on a daily basis? Give specific examples).
 - b. If the education has been useless, explain why.
 2. Has the education you received at NSE had an impact on how you do your work today? Explain.
 3. Compared to other types of education, has the entrepreneurial education you received at NSE provided any unique value?
 - . If so, what?
4. **Overall, what did the education received at NSE NOT give you?**
 - . **Where did you acquire this?**

Concluding

1. Is there anything I forgot to ask?
2. Is there anything else you want to talk about?
3. Can I get in touch again if I come up with something more to ask about?

Attachment 3

Attachment 3: Questions associated with Entrepreneurial Passion and Educational Experience in the existing survey used in the quantitative analysis.

ENTREPRENEURIAL PASSION

Please indicate whether you find the following hypothetical business related activities enjoyable and exciting

39. CREATING SOMETHING NEW - Please indicate the extent to which you agree or disagree with each statement:

	Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
It is exciting to figure out new ways to solve unmet market needs that can be commercialized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Searching for new ideas for products/services to offer is enjoyable to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am motivated to figure out how to make existing products/services better	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scanning the environment for new opportunities really excites me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inventing new solutions to problems is an important part of who I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. STARTING A NEW BUSINESS - Please indicate the extent to which you agree or disagree with each statement:

	Strongly Disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
Establishing a new company excites me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Owning my own company energizes me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nurturing a new business through its emerging success is enjoyable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being the founder of a business is an important part of who I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

41. LEADERSHIP - Please indicate the extent to which you agree or disagree with each statement:

	Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
I really like finding the right people to market my product/service to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assembling the right people to work for my business is exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pushing my employees and myself to make our company better motivates me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nurturing and growing companies is an important part of who I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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I really like finding the right people to market my product/service to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assembling the right people to work for my business is exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pushing my employees and myself to make our company better motivates me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nurturing and growing companies is an important part of who I am	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

EDUCATIONAL EXPERIENCE

In this section we ask questions relating to what entrepreneurial knowledge, skills and abilities you perceive to have gained from studying at the NTNU School of Entrepreneurship

42. **KNOWLEDGE AND SKILLS RELATED TO THE ENTREPRENEURIAL PROCESS - Please indicate to what extent the NTNU School of Entrepreneurship has prepared you for the following entrepreneurial activities, where 1= to a very low extent and 7= to a very high extent**

	1.	2.	3.	4.	5.	6.	7.
Developing business plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial forecasting in new businesses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entrepreneurial marketing (including marketing with limited means)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning and managing for business growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing a sustainable and enduring business model	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generating new business opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

43. **JUDGMENTAL ABILITY AND DECISION-MAKING RELATED TO ENTREPRENEURIAL ACTION - Please indicate to what extent the NTNU School of Entrepreneurship prepared you for the following entrepreneurial activities, where 1= to a very low extent and 7= to a very high extent.**

	1.	2.	3.	4.	5.	6.	7.
Making decisions in situations characterised by risk or uncertainty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating business opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating different sources of information as a basis for entrepreneurial action	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

44. **SOCIAL SKILLS AND NETWORKING ABILITIES - Please indicate to what extent the NTNU School of Entrepreneurship prepared you for the following entrepreneurial activities, where 1= to a very low extent and 7= to a very high extent.**

	1.	2.	3.	4.	5.	6.	7.
Communicating a business idea for investors or other stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promoting and selling a product or service to a target audience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborating with members in a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engaging in social activities to promote a business idea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Handling challenges related to team processes in a new business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

45. **In hindsight, please indicate to what extent you are satisfied with the master program, where 1= to a very low extent and 5= to a very high extent**

1.
 2.
 3.

4.
 5.

Attachment 4

Factor analysis on the items associated with Entrepreneurial Passion from the existing survey. The factor analysis proposed three different components of Entrepreneurial Passion, since the items loaded on four factors represented by a variance above 1, which is recommended (Ringdal, 2014). This is represented by bold in the the table below. The first four items "solve", "search", "improve", and "scann" represents intense positive feelings for the component "Passion for Inventing" (see [2.1.3](#)) and loaded on one factor. The following three items establish", "own" and "nurture" represents intense positive feelings for the component "Passion for founding" (see [2.1.3](#)) and loaded on one factor. The last three components "find_people", "assemble_p~e" and "pushing_em~e" represents intense positive feelings for the component "Passion for developing" (see [2.1.3](#)) and loaded on one factor.

Attachment 4: Exploratory factor analysis on the items associated with Entrepreneurial Passion from the existing survey

Factor analysis/correlation
 Method: principal factors
 Rotation: orthogonal varimax (Kaiser off)

Number of obs = 344
 Retained factors = 4
 Number of params = 34

Factor	Variance	Difference	Proportion	Cumulative
Factor1	2.42113	0.13238	0.4037	0.4037
Factor2	2.28875	0.50277	0.3816	0.7853
Factor3	1.78598	1.67628	0.2978	1.0831
Factor4	0.10970	.	0.0183	1.1014

LR test: independent vs. saturated: $\chi^2(45) = 2157.52$ Prob> $\chi^2 = 0.0000$

Rotated factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Factor4	Uniqueness
solve	0.6285	0.3346	0.3298	0.0013	0.3843
search	0.7763	0.2939	0.2088	-0.0517	0.2647
improve	0.6097	0.2178	0.2366	0.2319	0.4711
scann	0.7823	0.2950	0.1666	0.0158	0.2730
establish	0.3202	0.7558	0.2286	0.0673	0.2695
own	0.2617	0.7868	0.2153	-0.0568	0.2629
nurture	0.2868	0.7166	0.3268	0.0503	0.2949
find_people	0.3020	0.2939	0.6151	-0.1472	0.4224
assemble_p~e	0.2348	0.2988	0.7416	0.0193	0.3051
pushing_em~e	0.2004	0.2767	0.6450	0.1438	0.4466

Factor rotation matrix

	Factor1	Factor2	Factor3	Factor4
Factor1	0.6159	0.6058	0.5026	0.0335
Factor2	-0.7747	0.3585	0.5197	-0.0358
Factor3	0.1334	-0.7102	0.6907	0.0293
Factor4	-0.0523	0.0133	-0.0185	0.9984

Attachment 5

Factor analysis on the items associated with Educational Experience from the existing survey. The factor analysis proposed four different components of educational experience, since the items loaded on four factors represented by a variance above 1, which is recommended (Ringdal, 2014). This is represented by bold in the the table below. The first six items "edu_develop~s", "edu_financ~g", "edu_entre_m~g", "edu_plan_g~h", "edu_busine~l" and "edu_opport~s" represents the component "Knowledge and Skills" (see 2.2.2.1) and loaded on one factor. The following three items "edu_decision", "edu_evalua~p" and "edu_evalua~f" represents the component "Judgement ability and Decision making" (see 2.2.2.2) and loaded on one factor. The following items "edu_commun~e", "edu_promot~l", "edu_collab~e", "edu_engage~l" and "edu_handle~s" represents the component "Social-and Networking abilities" (see 2.2.2.3) and loaded on two factors.

Attachment 5: Exploratory factor analysis on the items associated with Educational Experience from the existing survey.

Factor analysis/correlation
 Method: principal factors
 Rotation: orthogonal varimax (Kaiser off)

Number of obs = 337
 Retained factors = 7
 Number of params = 84

Factor	Variance	Difference	Proportion	Cumulative
Factor1	3.95813	0.90672	0.3992	0.3992
Factor2	3.05141	1.25817	0.3077	0.7069
Factor3	1.79324	0.29765	0.1808	0.8877
Factor4	1.49559	1.33825	0.1508	1.0385
Factor5	0.15734	0.04543	0.0159	1.0544
Factor6	0.11191	0.06263	0.0113	1.0657
Factor7	0.04928	.	0.0050	1.0707

LR test: independent vs. saturated: $\chi^2(105) = 4196.91$ Prob> $\chi^2 = 0.0000$

Rotated factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Uniqueness
edu_develop-s	0.6132	0.5174	0.1173	0.2360	0.0886	0.2336	0.0094	0.2244
edu_financ-g	0.7215	0.2418	0.1192	0.2078	-0.1209	0.0439	0.0786	0.3409
edu_entr_m-g	0.7439	0.3580	0.1824	0.1036	-0.0480	-0.0347	-0.0548	0.2679
edu_plan_g-h	0.7998	0.2461	0.2108	0.2164	0.0104	-0.0603	-0.0314	0.2038
edu_busine-l	0.7275	0.3572	0.2040	0.2829	0.1523	0.0304	0.0820	0.1907
edu_opport-s	0.5377	0.5751	0.2080	0.2841	0.2561	0.0759	0.0203	0.1844
edu_decision	0.3830	0.2442	0.3546	0.5063	-0.0766	-0.0560	-0.0323	0.4016
edu_evalua-p	0.5094	0.4681	0.1819	0.5479	0.1115	0.0918	0.0267	0.1666
edu_evalua-f	0.3669	0.3348	0.2619	0.6079	0.0009	-0.0025	0.0176	0.3148
edu_commun-e	0.3482	0.7827	0.2038	0.2525	0.0182	0.0115	0.0258	0.1597
edu_promot-l	0.3837	0.7111	0.2509	0.1571	-0.1068	-0.1090	-0.0178	0.2359
edu_collab-e	0.1464	0.1958	0.6718	0.2060	0.0418	0.0531	0.0284	0.4412
edu_engage-l	0.2781	0.5853	0.4756	0.1337	0.0436	0.1150	0.0241	0.3202
edu_handle-s	0.2701	0.3633	0.6529	0.1832	-0.0209	-0.0633	-0.0342	0.3296
edu_satisf-n	0.2632	0.2369	0.4087	0.2648	0.0979	0.0162	0.1621	0.6014

Factor rotation matrix

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7
Factor1	0.6399	0.5601	0.3707	0.3687	0.0439	0.0327	0.0238
Factor2	-0.6354	0.1656	0.7463	0.1028	0.0010	-0.0337	0.0171
Factor3	0.2817	-0.7984	0.3607	0.3744	-0.0634	-0.0883	0.0335
Factor4	0.3224	-0.0653	0.3981	-0.8221	-0.1910	-0.1285	-0.0669
Factor5	-0.0583	0.1243	-0.1219	0.1891	-0.7523	-0.5558	-0.2357
Factor6	-0.0121	-0.0179	0.0250	0.0202	-0.6107	0.7853	0.0942
Factor7	-0.0050	0.0386	-0.0396	-0.0368	-0.1365	-0.2187	0.9639

Attachment 6

Attachment 6: Chronbach alpha test on the items in the existing survey.

Table 1: Chronbach alpha test on the items composing the variable intense positive feelings for «Passion for inventing» The scale reliability coefficient represented in bold in the figures measures the degree of internal consistency between the factors included in the composite variables (Ringdal, 2014).

Passion for inventing:

Test scale = mean(unstandardized items)

Average interitem covariance:	.8834501
Number of items in the scale:	5
Scale reliability coefficient:	0.8662

Table 2: Chronbach alpha test on the items composing the variable intense positive feelings for «Passion for founding».

Passion for founding:

Test scale = mean(unstandardized items)

Average interitem covariance:	1.615453
Number of items in the scale:	3
Scale reliability coefficient:	0.8927

Table 3: Chronbach alpha test on the items composing the variable intense positive feelings for «Passion for developing».

Passion for developing:

Test scale = mean(unstandardized items)

Average interitem covariance:	.9025911
Number of items in the scale:	3
Scale reliability coefficient:	0.8263

Table 4: Chronbach alpha test on the items composing the component «Knowledge and skills».

Knowledge and Skills:

Test scale = mean(unstandardized items)

Average interitem covariance:	2.133245
Number of items in the scale:	6
Scale reliability coefficient:	0.9332

Table 5: Chronbach alpha test on the items composing the component «Judgement ability and decision making».

Judgement ability and Decision making:

Test scale = mean(unstandardized items)

Average interitem covariance:	1.799647
Number of items in the scale:	3
Scale reliability coefficient:	0.8643

Table 6: Chronbach alpha test on the items composing the component «Social-and networking abilities».

Social-and Networking abilities:

Test scale = mean(unstandardized items)

Average interitem covariance:	2.374166
Number of items in the scale:	3
Scale reliability coefficient:	0.8863

Table 7: Chronbach alpha test on the items composing the component «Teamwork abilities».

Teamwork abilities:

Test scale = mean(unstandardized items)

Average interitem covariance:	1.335499
Number of items in the scale:	2
Scale reliability coefficient:	0.7688

