Master's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Economics and Management
Dept. of Industrial Economics and Technology Management

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Exploration of business opportunities in a pre-venture phase.

An inductive study of how nascent entrepreneurs in a VCP explore business ideas before starting a new venture.

Master's thesis in Entrepreneurship
Supervisor: Dag Håkon Haneberg
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Abstract

Venture Creation Programs (VCP) are described as one of the most extreme approaches to entrepreneurship education, but how the nascent entrepreneurs enrolled at a VCP discover business opportunities has long been uncharted territory. By investigating how students at the VCP NTNU School of Entrepreneurship (NSE) perform feasibility studies in preselected teams, we shed light upon how nascent entrepreneurs enrolled at a VCP explore business ideas before starting a new venture.

Seven newly enrolled nascent entrepreneurs at NSE conducted five team-based feasibility studies over fourteen weeks. They participated in four in-depth individual semi-structured interviews each during this period. The qualitative data from the interviews were analyzed using the Gioia Methodology for inductive research.

We found that nascent entrepreneurs exploring business ideas at a VCP are highly dependent on their team functioning level. Their exploration process is based on building and managing knowledge within four knowledge classes: industry-, market-, problem- and solution knowledge. The knowledge is built and managed through a nested subprocess based on constructing hypotheses that they solve and answer by building networks of weak ties. The biggest obstacle in their exploration is team conflicts and the danger of "not knowing what they do not know", which we have identified as knowledge gaps.

Overall, we conclude that nascent entrepreneurs in a VCP explore business ideas by acquiring resources through networks and relying on guidance from experienced VCP mentors to strategically pursue and manage their resources. In addition, VCP mentors play a significant role in resolving conflicts, challenge the status quo, uncover biases, and identifying knowledge gaps.

Our findings represent novel insights into how nascent entrepreneurs in VCPs utilize mentors and team-based feasibility studies to explore business ideas. This has implications for both existing and future VCPs.

Sammendrag

"Venture creation programs" (VCP) har blitt beskrevet som en av de mest ekstreme tilnærmingene til entreprenørskapsutdanning, men hvordan "nascent entrepreneurs" i en VCP oppdager forretningsmuligheter har lenge vært ukjent territorium. Ved å undersøke hvordan studenter i VCP'en ved NTNUs Entreprenørskole (NSE) gjennomfører mulighetsstudier i forhåndsbestemte team, belyser vi hvordan "nascent entrepreneurs" i en VCP utforsker forretningsideer før de starter et nytt foretak.

Syv ferske "nascente entrepreneurs" ved NSE gjennomførte fem team-baserte mulighetsstudier over fjorten uker. Hver av de deltok i fire individuelle semistrukturerte dybdeintervjuer i denne perioden. Den kvalitative dataen fra intervjuene ble analysert ved bruk av Gioia-Metoden for induktiv forskning.

Vi oppdaget at "nascent entrepreneurs" som utforsker forretningsidéer i en VCP avhenger sterkt av teamets funksjonsnivå. Utforskningsprosessen baserer seg på å erverve og forvalte kunnskap innen fire kunnskapsklasser: bransje-, marked-, problem- og løsningskunnskap. Kunnskapen erverves og forvaltes gjennom en prosess basert på å konstruere hypoteser som løses og besvares gjennom å bygge et nettverk av svake bånd. Det største hinderet i utforskningsfasen er konflikt i teamet og faren med å "ikke vite hva man ikke vet", som vi har identifisert som kunnskapshull.

Samlet konkluderer vi med at "nascent entrepreneurs" i en VCP utforsker forretningsideer med å hente inn ressurser gjennom nettverk, og stole på veiledning fra erfarne VCP-mentorer for å jage og forvalte ressurser. I tillegg spiller VCP-mentorer en viktig rolle i å løse konflikter i teamet, utfordre status quo, avdekke bias og identifisere kunnskapshull.

Våre funn representerer ny innsikt i hvordan "nascent entrepreneurs" i en VCP bruker mentorer og teambaserte mulighetsstudier for å utforske forretningsideer. Dette har implikasjoner for både eksisterende og fremtidige VCPer.

Preface

This document is written by three master students at the NTNU School of Entrepreneurship through the Department of Industrial Economics and Technology Management (IØT) at the Norwegian University of Science and Technology (NTNU). This document serves as our final report in the course "TIØ4945 - Entrepreneurship, Master's Thesis".

We wish to sincerely acknowledge and thank our supervisor, Associate Professor Dag Håkon Haneberg, for his endless support, passion, and expertise within the field of study. Without his invaluable knowledge and reflection, this thesis would not have been possible.

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Trondheim, June, 2021

Einar Gjellan

Rasmus Thunem

Marcus Wethe

Abbreviations

The following abbreviations have been used in this thesis:

VCP	Venture Creation Program
NSE	NTNU School of Entrepreneurship
RBT	Resource-based theory
KSTE	Knowledge Spillover Theory of Entrepreneurship

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1 Introduction

1.1 Background & research question

Entrepreneurship is regarded as a critical tool for economic development in terms of employment, innovation, and welfare events (Schumpeter, 1947). Entrepreneurship can be defined as discovering and developing possibilities to create value (Bozward and Rogers-Draycott, 2020), while a nascent entrepreneur is defined as someone who initiates serious activities that are intended to culminate in a viable business startup (Chell, 2008).

Traditionally, universities were expected to fulfill two missions: research and teaching (Pirnay *et al.*, 2003). Commercial activities were at best considered irrelevant and, in most cases, vulgar (Pirnay *et al*., 2003). Over time, universities have been given a role as active contributors to regional economic growth through time and delivering entrepreneurship education might be considered as an essential initiative (Rasmussen and Sørheim, 2006). Entrepreneurship education is widely regarded as a crucial component of future higher education, and it is currently one of the fastest-growing subject areas worldwide (Lockyer and Adams, 2014; Ratten and Usmanij, 2020).

Entrepreneurship education is a fragmented field of study (Mwasalwiba, 2010). Contemporary literature tends to classify them into three educational categories; educating about, for, and through (or in or embedded) entrepreneurship (Pittaway and Edwards, 2012; Aadland and Aaboen, 2018). Educating *about* entrepreneurship is a traditional method where students learn about entrepreneurship as a phenomenon, preparing students to work for an entrepreneur instead of becoming one (Rasmussen and Sørheim, 2006; Mwasalwiba, 2010). Educating *for* entrepreneurship aims to teach the students skills preparing them for entrepreneurial careers through role play and acting (Sirelkhatim and Gangi, 2015; Aadland and Aaboen, 2018).

Educating *through* is an experiential approach in which students learn entrepreneurship by engaging in an actual entrepreneurial process creating a venture (Donnellon, *et al.*, 2014; Lackéus and Williams Middleton, 2015). Politis (2005) highlights real entrepreneurial experiences as essential in order to develop entrepreneurial knowledge. Rooted in action-based entrepreneurship, the pedagogy is student-centered, involving experiential learning, problem-solving, project-based learning, and creativity (Rasmussen and Sørheim, 2006; Hägg and Kurczewska, 2016; Hägg and Gabrielsson, 2019).

The increased interest for and emergence of action-based entrepreneurial programs led to the term Venture Creation Program, hereafter referred to as VCP (Donnellon, *et al.*, 2014; Adams, 2016). Lackéus and Williams Middleton (2015, p.50) defined VCP as an educational program where students "utilize the on-going creation of a real-life venture as the primary learning vessel, thus involving venture creation as part of the formal curriculum, including the intention to incorporate.". A VCP can be characterized using the following five characteristics: experiential learning, interdisciplinarity, process-based curriculum, an external network of resources, and a contributor to regional development (Lackéus and Williams Middleton, 2015). Although VCP has been described as "the epitome of entrepreneurship education" (Lockyer and Adams, 2014), its prevalence is still considered rare (Hägg, 2017). However, there is a rising tendency to adopt the approach within entrepreneurship education (Lockyer and Adams, 2014; Lackéus, 2015), resulting a request for additional research on the context of VCPs (see for example Spilling, Johansen and Støren, 2015; Haneberg, Aaboen and Williams Middleton, 2019; Sørheim, Aadland and Haneberg, 2021). Although there are several ways to design a VCP, most VCPs involve an initial phase of idea evaluation and verification (Rasmussen and Sørheim, 2006; Lackéus and Williams Middleton, 2015; Aadland and Aaboen, 2018). Hence, we seek to dig into this phase and determine how an idea is evaluated and verified. Thus, the purpose of this thesis is *to investigate how nascent entrepreneurs in VCPs explore business ideas before starting a new venture.*

This study takes place at the VCP at NTNU School of Entrepreneurship, hereafter referred to as NSE. NSE is considered a VCP, and a leading institution for higher entrepreneurship education in Norway (Warhuus and Basaiawmoit, 2014; Spilling, Johansen and Støren, 2015). Every year, roughly 50% of the graduating students continue to work in their startup post-graduation (Sørheim, Aadland and Haneberg, 2021). Investigating graduated ventures from NSE, Sørheim, Aadland and Haneberg (2021) found that 82 ventures started at NSE generated a total of approximately $60 million[1], while seven had experienced profitable exits. In the initial evaluation and verification phase at NSE, students conduct feasibility studies in randomly selected teams (Ansteensen, 2015; Haneberg, Aaboen and Williams Middleton, 2019). NSE feasibility studies creates the foundation of the opportunities the students' ventures later try to exploit (Haugane and Saastad, 2020).

[1] Using conversation rate of 1USD = 6,4845NOK

Considering the previous paragraph, the authors wanted to have an open approach trying to figure out how NSE as a VCP attains such achievements through newly enrolled students' perspectives during the idea evaluation phase. Hence, the thesis was designed by empirics originating from seven newly enrolled NSE students. Accordingly, the research question for this research emerged organically throughout the data analyzing process. Through a literature review conducted during the analyzing phase (Gioia, Corley and Hamilton, 2013), we examined if there are any literature that can help to answer emerging research questions. We have not encountered any empirical research addressing the purpose set forward. Hence, we assume to have identified a gap in current literature. With this thesis, we seek to cover a current literature gap through answering the following research questions:

RQ 1: *How do preselection of teams affect the exploration of business ideas in a VCP?*
RQ 2: *How does the preselected team explore business ideas in a VCP?*

By doing this research, the authors contribute to the VCP research primarily in two ways: Firstly, the authors contribute to filling a current literature gap within VCP literature. Secondly, this research provides nuanced perspectives of how a nascent entrepreneurial team acts when searching for a viable business opportunity. This might guide existing and potential new VCP managers in facilitating the idea evaluation phase. We also assume to provide interesting insights into team management of a team can manage their resources efficiently to identify a business opportunity.

1.2 Structure of the thesis

As mentioned in the previous chapter, the information provided by seven newly enrolled NSE students lay the foundation for this thesis. In the following chapter, all relevant literature is presented. Further on, our application of the Gioia Methodology and our approachs' strengths and weaknesses are elaborated. Subsequently, all findings are presented before being discussed in line with relevant literature. Lastly, a conclusion is put forward before we raise attention to limitations to consider in future research and what implications this study has for practice.

2 Theoretical framework

The following theoretical framework is a result of our inductive research methodology. Indeed, the following theories result from our study, hence reflecting the content of both our findings and discussions. However, as theories' significance is best preserved when in their actual context, the following chapter will present them as true to their context as possible. Thereby we embrace the study and this thesis both in context and content. The overarching theoretical framework we present is meant to shed light on the relevance of our findings.

Nevertheless, due to the vast amount of articles amount entrepreneurship published annually and the continually increasing popularity of entrepreneurship as a subject for research, we hope to elucidate the thesis in the utmost rigor theories of entrepreneurship. To complement theories that have to withstand the test of time, we have included recently published articles that help expand the frontier of entrepreneurship research.

As shown in Appendix 6: Data analysis we have found three overarching topics which we will include in our theoretical framework: Entrepreneurial process, entrepreneurial teams, and entrepreneurial knowledge management.

2.1 Entrepreneurial process

Dimov, Schaefer and Pistrui (2020) highlights the complexity of viewing entrepreneurship through a process lens. The literature of entrepreneurial processes helps immerse into the depth of our findings by structuring them into a sequence of events. With such purpose, we will investigate the current knowledge available in the upcoming theoretical chapter. Thereby we will be able to disclose the processes nascent entrepreneurs utilize in the exploration of business opportunities.

Entrepreneurial processes can be sorted through their level of aggregation. Were the most aggregated processes create an overarching outline for the structure of the sequenced events. The events are described broadly in high aggregated processes, for example, “validating a business opportunity”. However, at a less aggregated level, the processes consist of subprocesses like “market research” that further consist of their own nested processes such as “customer interviews”. By spiraling down the process hierarchy, events are described through a continuously more nuanced lens, unraveling the details of entrepreneurship (Dimov, Schaefer and Pistrui, 2020).

2.2 Entrepreneurial teams

Research on start-up teams is an emergent field where there still is a lot to learn (Brattström, 2019). Based on systematic evidence from literature, Brattstörm (2019) presents a framework with roots from sociology, strategy, and social psychology to describe nascent start-up team characteristics. More specifically: who they are (team composition), how they work (team structure), and how they stay together (team emotions) (Brattstörm, 2019, p.1). Brattstörm (2019) stresses to consider the three dimensions as interrelated rather than isolated. The following chapters describe the three dimensions, complemented with literature found relevant within each structure.

2.2.1 Team composition

Rooted in human nature, humans tend to seek humans like ourselves (McPherson, Smith-Lovin and Cook, 2001). Hence, most early-stage start-up teams share similarities such as gender, attributes, skills, and characteristics – determined as homogenous teams (Zhou and Rosini, 2015; Brattström, 2019). In contrast, heterogeneous teams have a lower degree of shared cognition. These teams are composed of different skills, resources, competencies, and perspectives (Brattström, 2019). There are two main drivers for homogenous teams; social networks in which the team members are recruited and in-group bias, which unconsciously influences the composition of nascent entrepreneurial teams (Brattström, 2019).

Early studies of entrepreneurial team composition showed that new ventures in the early stages of highly novel strategies benefited from a homogenous team composition (Zhou and Rosini, 2015). Homogenous teams promote smooth functioning, solve complex problems, and manage conflicts more efficiently (Brattström, 2019). However, the increased efficiency comes at the cost of cognitive and social blind spots (Brattström, 2019). Heterogenous teams may be less affected by these blind spots as contrasting skills, resources, knowledge, and network among the team members widens the perspective (Brattström, 2019).

As the venture creating phase involves several uncertainties, teams must have complementary skills and be creative to deal with the uncertainties in this volatile context (Diakanastasi, Karagiannaki and Pramatari, 2018; Brattström, 2019). Heterogenous teams can bring in more information from different perspectives, promoting task efficiency, which benefits innovative or complex problem-solving (Zhou and Rosini, 2015). Henneke and Lüthje (2007) suggests heterogeneity can act as a catalysator for creativity, allowing an assessment of the market

simultaneously as technological and financial environments of a new venture. Foo, Sin and Yiong (2006) claim that diversity improves the team's problem-solving ability.

Homogenous teams can have a more challenging time establishing a formal authority, making it necessary to create leadership and work relationships (Brattström, 2019). However, homogenous teams are better off with a lack of formal rules and regulations as socialization or informal control will promote efficiency the most (Guy, Smith and Bentler, 1994). In contrast, heterogeneous teams are less predictable due to diversity (Guy, Smith and Bentler, 1994). Hence, more formalized rules and regulations are deemed necessary (Guy, Smith and Bentler, 1994).

An absence of formal authority in homogenous teams can blur team relationships and roles, preventing well deliberated and reflected decisions – potentially hampering team performance (Brattström, 2019). To ease the drawbacks of a homogeneous team, Brattström (2019) suggests an external sparring partner, such as an incubator coach, to be beneficial and help widen their perspective.

2.2.2 Team structure

Due to uncertainties, entrepreneurial teams deal more with change than stability (Brattström, 2019). These uncertainties create events promoting positive and negative emotions shaping the team members' performance (Foo, Sin and Yiong, 2006). Due to this uncertainty, individuals look to leaders for guidance on handling various situations (Sirén, He and Wesemann, 2020). In contrast to mature ventures, where hierarchical structures define leadership roles, nascent venture teams lack this structure as decision-making routines, roles, and norms are in the process of being established (Sirén, He and Wesemann, 2020).

Most teams usually function without any authority or structure; however, nascent venture teams can benefit from having formal or informal leaders helping to create a vision and promote structure within a team (Goethals, Sorenson and Burns, 2004; Foo, Sin and Yiong, 2006; Klotz *et al.*, 2014). Although formalized leadership in nascent entrepreneurial teams is relatively uncommon, the 'idea owner' or 'lead entrepreneur' are usually perceived as leaders by having 'leading attributes' (Sirén, He and Wesemann, 2020). Sirén, He and Wesemann, (2020) found that all team members can be perceived and emerge as leaders as a response to change. Diakanastasi, Karagiannaki and Pramatari (2018) claim that an absence of defined roles in a nascent team might create confusion and disagreement within the team, while Foo, Sin and Yiong (2006) state a distinct leader can be necessary.

As communication has been described as the heart of group behavior (Guy, Smith and Bentler, 1994), team cohesion is reflected by how socially integrated a team is (Chen, Chang and Chang, 2017). Foo, Sin and Yiong (2006) state that teams frequently communicating without being honest will not achieve optimal sharing of information, making decision-making more difficult. Hence, open communication allows for improved decision-making quality when the team explores several courses of action as team members become aware of all hidden assumptions (Foo, Sin and Yiong, 2006). If team members cannot communicate efficiently, misunderstandings and later conflicts might worsen the teamwork (Diakanastasi, Karagiannaki and Pramatari, 2018). If the team is unable to recognize and solve misunderstandings, it might result in an information overload (Foo, Sin and Yiong, 2006), further decreasing the teams' functioning level (Diakanastasi, Karagiannaki and Pramatari, 2018).

Open communication and social integration before negative effects of information overload occurs are found to increase team members' satisfaction (Foo, Sin and Yiong, 2006). Social integration is a multifaced phenomenon reflecting the team members' attraction to the group, satisfaction with the other group members, and social communication among the group members (Guy, Smith and Bentler,1994). Open communication involves tolerating, encouraging, and engaging in honest expression of views (Foo, Sin and Yiong, 2006). By promoting honesty, a socially integrated team will experience greater efficiency in coordinating tasks (Guy, Smith and Bentler,1994).

2.2.3 Team emotions

The entrepreneurial journey can be described as an emotional rollercoaster fluctuating between high pressure, stress, uncertainty, and relative calm, and early accomplishments (De Cock, Denoo and Clarysse, 2020). Heavy workload, ambiguity, and conflicting roles can cause burnout among the team, facilitating unproductive behavior (Omrane, Kammoun and Seaman, 2018). When things go wrong, disappointments can turn into a blame game cultivating negative emotions (Brattström, 2019).

By experiencing negative team emotions, team cohesion tends to be reduced (Chen, Chang and Chang, 2017). Team cohesion can be understood as a result of shared team cognition affected by conflicts emerging from the team cognition (Chen, Chang and Chang, 2017). Brattström (2019) emphasizes the power of team persistence, keeping the team together in a phase where change puts emotion to the test. Positive emotions such as passion, attachment, joy, and energy constitute building cohesion and keeping the team together (Chen, Chang and Chang, 2017;

Brattström, 2019). Hence, shared cognition is a critical mechanism at an early stage to promote a harmonious atmosphere maintaining team cohesion (Chen, Chang and Chang, 2017).

In team theory, there is a general distinction between relationship conflicts and cognitive conflicts, such as task conflicts (Klotz *et al*., 2014). While relationship conflicts refer to disagreements due to interpersonal differences, task conflict describes disagreements on how to complete a job task concerning the best way to accomplish the team's objectives (Klotz *et al.*, 2014). Task conflicts have the potential to enhance team performance, while relationship conflicts are sources of dysfunctional friction damaging team harmony, challenging team persistence (Klotz *et al*, 2014; Chen, Chang and Chang, 2017; Brattström, 2019). Lack of shared cognition promotes misunderstandings and misinterpretations during communication, resulting in a greater frequency of relationship conflicts (Chen, Chang and Chang, 2017). As task and relationship conflicts are highly correlated, it is hard to harvest the benefits from task conflicts without experiencing relationship conflicts (Guenter et al., 2016). Team communication and trust have been found to mitigate between task and relationship conflicts (Guenter et al, 2016). However, if a team cannot communicate their thoughts efficiently, conflicts might arise as a result of misunderstandings (Diakanastasi, Karagiannaki and Pramatari, 2018).

2.3 Entrepreneurial knowledge management

Widding (2007) describes entrepreneurship as a multifunctional, multifaceted exercise. Therefore, the entrepreneur needs to access multifunctional knowledge to manage the new venture. Shane (2000) elaborates on the importance of knowledge before starting a new venture, claiming that prior knowledge is the most important factor for how an entrepreneur discovers business opportunities. Both authors view entrepreneurship as a field within the resource-based theory (RBT), where the entrepreneurs' core activity is managing knowledge as a resource.

When Widding (2007) describes the necessary multifunctional knowledge with the term "Business knowledge", where business knowledge is defined as "(…) multifunctional knowledge comprised of the product, market, organizational, and financing facets" (Widding, 2007, p.3). However, as Widding (2003; 2007) also proposes, the entrepreneur does not need to hold all the business knowledge alone. Instead, the entrepreneur can build a "knowledge reservoir" where knowledge can be accessed through external actors. The knowledge reservoir

can both be a source of knowledge that an entrepreneur must adopt. It can contain knowledge that the entrepreneur can use to control, validate or discard propositions and assumptions.

Shane (2000) proposes that prior information or knowledge is the key to exploring opportunities. He states that an opportunity is not found through search but by recognition due to the entrepreneurs' prior knowledge. Shane (2000), therefore, proposes that all entrepreneurs are not equally likely to recognize a business opportunity due to differences in prior knowledge. Further, he proposes three knowledge types necessary to discover a business opportunity: knowledge of markets, knowledge of ways to serve markets, and knowledge of customer problems.

Looking back to Widding (2007), he presents partially the same rationale, where knowledge is the key to recognizing business opportunities. However, he instead views knowledge as a capability or dynamic capability. In terms of an organization, the dynamic capability is the ability to identify opportunities and the capacity to use this knowledge to increase competitive advantage, strongly connected with the entrepreneurs' and the firm's knowledge reservoir.

2.4 Entrepreneurial learning

Entrepreneurial learning is the concept of building relevant knowledge, skills, and competencies through entrepreneurial activities (Politis, 2005). Entrepreneurial learning is highly associated with experiential learning through learning-by-doing in entrepreneurship. Hence, it is the outcome of practical activities within entrepreneurship (Politis and Gabrielsson, 2015). From Politis (2005), we see a separation of entrepreneurial learning into "entrepreneurial experiences" and "entrepreneurial knowledge". In entrepreneurial experiences, we understand the knowledge that increases the ability to organize and manage new ventures, condensed into the ability to cope with the 'liabilities of newness' that follows a new venture (Politis, 2005). For entrepreneurial knowledge, it is referred to the ability to recognize new business opportunities effectively. (Politis, 2005; Politis and Gabrielsson, 2015).

Rasmussen and Sørheim (2006) emphasize the positive effect of new venture formation and student success when a learning-by-doing approach to teach entrepreneurship was used—arguing that a VCP with access to sufficient infrastructure and mentoring capacity makes it possible to allow the students to explore and develop their entrepreneurial skills. Rasmussen and Sørheim (2006) propose that the effect of a VCP that utilizes learning-by-doing will train the students' skills within business concepts, business contexts, networking, and team. Their

proposal aligns with Politis' (2005) perspective on entrepreneurial experiences, while it emphasizes that experiential learning through learning-by-doing is the primary focus in a VCP.

From Lattacher, Gregori and Holzmann (2021), we understand experiential learning as a source of knowledge. He refers to experiential learning in the context of the knowledge spillover theory of entrepreneurship (KSTE). Lattacher, Gregori and Holzmann (2021) claim that entrepreneurial learning does not necessarily require experience; instead, entrepreneurs can acquire knowledge by learning vicariously from others. This can happen via observing others' behavior or by listening to individuals sharing their experiences. Hence, the knowledge is gained by spilling more knowledgeable individuals into the entrepreneur through social interaction (Lattacher, Gregori and Holzmann, 2021). This perspective elaborates Politis' (2005) description of how entrepreneurial knowledge comes from experiential learning through learning-by-doing. The KSTE, therefore, explains why entrepreneurial knowledge may be gained through learning-by-doing (Lattacher, Gregori and Holzmann, 2021).

The methods of gaining entrepreneurial knowledge through learning-by-doing will be presented through three concepts: Hypothesis-driven entrepreneurship, networking, and effectuation.

2.4.1 Hypothesis-driven entrepreneurship

Looking to the lean start-up framework from Erik Ries (2011), we see a proposition that learning-by-doing is a skill itself, where the entrepreneurial team starts with an idea and iteratively learns-by-doing and incrementally builds knowledge and improves the business idea (Ries, 2011; Coorevits and Schuurman, 2014). The lean start-up model is often viewed as "Hypothesis-driven entrepreneurship" as the learning-by-doing is done in teams, and the team uses one or more hypotheses to guide the team through each iteration (Leatherbee and Katila, 2020).

The hypothesis-driven entrepreneurship, as described by Leatherbee and Katila (2020), is a two-step method explained by the authors as hypothesis-based probing of business ideas consisting of the following steps:

1. Formulation of hypotheses in nine preidentified areas of the business idea.
2. Probe each hypothesis by interviewing customers and other stakeholders.

In the first step, the hypothesis is built based on the nine different areas from the Business Model Canvas from Osterwalder (2005). In the second step, the entrepreneurial team "gets out

of the building" and starts talking to potential customers and stakeholders, which is referred to as "probing" (Leatherbee & Katila, 2020).

Leatherbee and Katila (2020) found that the specific formulation of the hypothesis was not central. However, they found that few crisp hypotheses result in better probing. By confirming or disconfirming hypotheses by probing, the team structures the process of validating and controlling the business idea's feasibility (Klepper and Bruegge, 2018). This structure makes it possible for entrepreneurial teams to converge the business idea into a business opportunity before pursuing it (Ries, 2011; Leatherbee and Katila, 2020).

2.4.2 Social networks as a means for learning

Social networks are often defined as emerging patterns of a lasting relationship between people (Jenssen, 2001). In entrepreneurship, networks function as a toolbox of resources available to the entrepreneur when needed. Therefore, creating, maintenance and focusing networks is a crucial part of an entrepreneurs' skillset. We understand a network as consisting of different contacts that can be either weak ties or strong ties. Weak ties refer to contacts the entrepreneur does not meet very often. These ties provide a diversity of resources that is favorable in the exploration phases of entrepreneurship. Strong ties are on the other side contacts the entrepreneur encounter frequently. These ties have a higher trust level which gives access to assets that are particularly valuable in the exploitation phase of entrepreneurship (Soetanto, 2017). A combination and balance of weak and strong ties are deemed the most valuable to obtain a diversity of resources. Overall, the best way to gain new contacts is through an existing network; therefore, the time required to build a specific network is dependent on the entrepreneur's current network (Soetanto, 2017). Entrepreneurs rely on existing contacts to develop new contacts. Therefore, entrepreneurs' preexisting social networks before an entrepreneurial process starts will influence how social networks are developed during an entrepreneurial process. The accumulation of networks takes time, but through devotion and focus, entrepreneurs can build solid networks that help them explore and exploit business opportunities (Greve and Salaff, 2005; Soetanto, 2017).

In entrepreneurial learning and networks, it is common to differentiate between two types of learning. As mentioned earlier, the first is experiential learning, which is easily described by the phrase "learning-by-doing". The second type of learning is by Lattacher, Gregori and Holzmann (2021) mentioned as a subcategory of experiential learning that they called vicariously learning. It reflects their findings that one can also learn from observing or listening

to other peoples' experiences. This helps explain that one can both learn through networking and learn through a network. The former directly help improve networking skills which indirectly increases the ability to build and obtain resources from a network. In contrast, the latter mainly help obtain resources from a network (Soetanto, 2017). Furthermore, it is appropriate to distinguish between learning by strengthening, expanding, condensing, or creating networks (Soetanto, 2017). These types of learning outcomes from a network are shown in the table below:

Type of learning	**Process**	**Result**
Strengthening	Developing a weak tie into a strong tie.	Gives access to resources that require a stronger bound.
Expanding	Adding new contacts to the network.	Expand reach and resources available.
Condensing	Significantly reducing numbers of contacts.	Creates focus on resources that are most in-demand at the time.
Creating	Rebuilding network by introducing new contacts and replacing existing.	Helps shifting away from current network when resources available through it is no longer relevant.

Table 1: Learning outcome from a network (Soetanto, 2017)

In the establishment of a new venture, networking will vary depending on the phase of the establishment. Greve and Salaff (2005) explains the differences in networking by dividing the establishment process into three phases, as shown below in Table 1: Learning outcome from a network (Soetanto, 2017). They argue that the way entrepreneurs' network is mainly affected by what outcome they seek. Which again depends on where in the entrepreneurial processes they are and what their business idea currently requires. Entrepreneurs will often start with a wide network, and then scope in as the business idea develops, making it clearer what they need from their network (Greve and Salaff, 2005).

Phase of establishment	**Description of phase**	**Effect on networking**
Phase 1: Motivation	Discuss the initial idea, develop a business concept and get support.	Early they avoid committing publicly to the idea, therefore contacting mainly friends and family.
Phase 2: Planning	Preparations through diverse activities that give access to necessary knowledge and resources.	Mobilize a larger social network to acquire necessary resources such as information, skills, and business relations.
Phase 3: Establishment	Establish and run a firm, focus on daily activities, transactions, and solving problems.	Focuses network to the key persons who can provide commitment and resources.

Table 2: Phases of establishment and networking (Greve and Salaff, 2005)

2.4.3 Effectuation

In entrepreneurship literature, the concept of causational and effectual thinking is commonly mentioned. Sarasvathy (2001) defines causation as a process where the entrepreneur's goal is predetermined; thus, entrepreneurs focus on selecting and acquiring the necessary means to achieve that fixed end goal. On the other side, she defines effectuation as a process originating from the means accessible to the entrepreneur and focuses on exploring which ends those means can create (Sarasvathy, 2001). From Haneberg (2019) we recognize the effectual thinking as a method of experiential learning (Politis, 2005; Haneberg, 2019).

Causation is useful for finding an optimal path to a fixed location. In general, causation is excellent when information about the situation or event is available, can be analyzed and understood. In contrast, effectuation is best used for exploring different locations that can be reached from a fixed starting point. Effectuation is useful for situations without information that cannot be deconstructed or, in other ways, predicted with sufficient accuracy (Sarasvathy, 2001). Dew, Read and Sarasvathy (2009) found that expert entrepreneurs tend to prefer effectual thinking, whereas novice entrepreneurs tend to prefer causational thinking in decision making.

Causation and effectuation can seem like opposites, but their relation is more complex and intertwined. They can be present simultaneously, and in day-to-day life, we rapidly change between them. Common for both causation and effectuation is that they are important and necessary for reasoning and decision making. However, they usually excel in different contexts. For a theoretical understanding, it is easier to divide them inseparably, even though they in the real world often overlap and are intertwined (Sarasvathy, 2001).

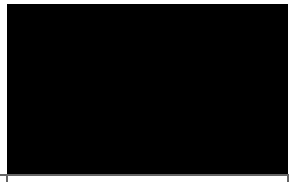
Causation VS Effectuation			
Information	Known	Unknown	Unknowable
Procedure of predication	Predication through information gathering and analyzing.	Predication through estimation techniques that enables analyzing.	Cannot be predicted.
Applicable method	Causational thinking.	Causational thinking.	Effectual thinking.

Table 3: Causational versus Effectual thinking (Sarasvathy, 2001)

2.5 Summary theory

This chapter described the literature relevant for the research purpose. Entrepreneurship has been described as a multifunctional and multifaced exercise (Widding, 2007). As entrepreneurship is complex in terms of its process (Dimov, Schaefer and Pistrui, 2020), entrepreneurial teams go through a rollercoaster of events during their entrepreneurial journey triggering emotional events among the team members (Brattström, 2019; De Cock, Denoo and Clarysse, 2020). Although there is no such thing as a perfect start-up team, the team composition, structure and emotions can help create an understanding of entrepreneurial teams (Brattström, 2019). Prior knowledge has been claimed a determinant for discovering opportunities (Shane, 2000). However, through experiential learning, individuals build entrepreneurial knowledge, which is referred to as the ability to recognize business opportunities efficiently (Politis, 2005; Politis and Gabrielsson, 2015). By forming and testing hypotheses, entrepreneurial knowledge can be built (Leatherbee and Katila, 2020). In an entrepreneurial process, the entrepreneur builds a network of relations that can act as a source of knowledge (Soetanto, 2017).

In contrast to novice entrepreneurs who employ causal thinking, expert entrepreneurs employ effectual thinking to a greater extent (Dew, Read and Sarasvathy, 2009). Effectual thinking has

been deemed beneficial in situations where information cannot be predicted (Sarasvathy, 2009).

3 Research methodology

During the fall of 2020, we conducted qualitative interviews with seven nascent entrepreneurs, which made the foundation for this master thesis through an inductive research approach. We followed the Gioia methodology (Gioia, Corley and Hamilton, 2013) to structure and analyze the data. In the following chapter, the context of the research and the chosen methodology is described. More specific: how the data was collected and analyzed, and why.

3.1 Research context, method and design

3.1.1 Context of the study

Seven entrepreneurship students, all newly enrolled to NSE, were interviewed three or four times during the first semester of the program. During this phase, they conducted initial idea evaluations of ideas – establishing the foundation for this thesis. Due to the criteria for enrolling at NSE, which is elaborated in the following section, the students investigated in this thesis can all be understood as nascent entrepreneurs in line with the Chell (2008) definition.

3.1.1.1 NTNU School of Entrepreneurship (NSE)

NSE is a leading action-based entrepreneurship education program in Norway (Spilling, Johansen and Støren, 2015). The 120-credit two-year master's degree program is located at the Norwegian University of Science and Technology – Norway's largest university (Sørheim, Aadland and Haneberg, 2021).

Once a year, several hundred students apply to the program, where only a fraction are accepted. Each class comprises approximately 35 students, both males and females, who enroll in the program from a broad range of backgrounds. About half of the enrolled students have a technological background, about one-third from social sciences, and the rest from other subject areas (Sørheim, Aadland and Haneberg, 2021).

To be eligible to apply, an applicant must be fluent in Norwegian and hold at least a bachelor's degree or have completed three years of a master's degree in technology (Nordheim, 2016; Sørheim, Aadland and Haneberg, 2021). To be accepted to NSE, students must communicate their motivation for engaging in venture creation through an application process (Nordheim, 2016).

The application process involves an application form (Appendix 2: NSE application form) where the applicant must share their motivation for engaging in venture creating activities. Along with other relevant documents such as academic record, résumé, and work certificates, NSE faculty decide which applicants that qualify for an in-depth interview (Sørheim, Aadland and Haneberg, 2021; Nordheim, 2016). Two faculty members examine the candidates during these interviews before selecting those they find the most promising potential entrepreneurs.

During the first semester, the students evaluate new business ideas through the subject "TIØ4330 – Idea Search and Market Assessment" (Sørheim, Aadland and Haneberg, 2021). In this subject, the student teams carry out five mandatory feasibility studies, with an option to do one final voluntary feasibility study. The ideas tested during these feasibility studies might have several sources of origin. Some ideas are self-generated, some originate from staff or TTO at the University, and some originate from external stakeholders in the VCP network, such as local entrepreneurs or businesses (Sørheim, Aadland and Haneberg, 2021). All ideas brought into NSE are brought in with the intention that students can turn the idea into his or her venture, becoming the majority shareholder if the idea is incorporated. Feasibility studies are more thoroughly described in the following chapter.

At the end of the first semester, the students form teams themselves and develop a new venture based on the business ideas the students have evaluated (Sørheim, Aadland and Haneberg, 2021). The students go through a venture planning and development phase for the remaining three semesters of the program simultaneously as they conduct academic courses and theses (Sørheim, Aadland and Haneberg, 2021).

3.1.1.2 Feasibility studies at NSE

In each feasibility study at NSE, four to five students are mixed into groups to identify and evaluate business ideas that can serve as a foundation for the new venture they will create as a part of the NSE program.

Before the feasibility study week starts, the team must prequalify a business idea to prevent an early crash in the feasibility study week. Prequalification involves a brief report of the idea the team wants to investigate during the feasibility study week. A template for the prequalification can be seen in Appendix 3: Prequalification template. This report is filed to the faculty staff, who either approves or rejects the prequalification document. If rejected, the team must continue investigating and iterating on their idea before they re-file the prequalification to a new extended deadline.

Each feasibility study lasts for one week, starting Monday morning and ending by Friday at noon. By Thursday evening, every team has to submit a feasibility report of what they have found out during the previous week. A translated template of what the students should include in their report can be found in Appendix 4: Feasibility report template. On Friday morning, every team must present all findings in a 10-minute-long presentation facing their fellow students and a panel. This panel usually varies from one feasibility study to another. Normally, knowledgeable stakeholders such as faculty members, entrepreneurs, NSE alumni students, and investors comprise the panel. After the presentation, the panel delivers honest feedback and questions based on each teams' report and presentation. Through this session, the students are experiencing what they might expect from a future stakeholder when the business idea is turned into a venture.

3.1.2 Inductive qualitative research method

According to Jacobsen (2016), a qualitative approach to the research design is favorable when a research area is less explored, when we seek to develop new theories and hypotheses, and the research question is not predetermined. Since the purpose of this master thesis is to investigate how nascent entrepreneurs in VCPs explore business ideas before starting a new venture – an exploration of detailed nuances of personal experiences – a qualitative research approach is suitable (Flick, 2015; Jacobsen, 2016).

Following an inductive approach, the reasoning in this thesis originates from the gathered data rather than theory. This research design is beneficial when we seek to identify "how" dynamics present within single settings; a multi-case study is appropriate, especially when there is little theoretical precedent for a deductive study (Eisenhardt, 1989; Yin, 2017).

3.1.3 Selection and presentation of cases

Due to the chosen inductive design, the selection of informants followed an open approach, comprising two general criteria to provide varied and rich data for the analysis (Jacobsen, 2016).

The first criteria for selecting cases were that the informant must have newly been enrolled to NSE. Since the authors of this thesis also are enrolled at the VCP NSE, we already had more accessible access to a great range of informants corresponding with this criterion.

The second criteria for the selection were to have both width and variety among the informants' gender and previous education. Referring to section *3.1.1.1 NTNU School of Entrepreneurship*

(NSE), NSE provided a sufficient population to select from as the students enrolled from a broad range of fields of study.

The fact that the authors come from the same study program as the informants can provide both complementary understanding and biases to the gathered data (Jacobsen, 2016). This is more detailed explained in section *3.4 Strengths and weaknesses of the method*.

Forty students enrolled to NSE in 2020, of which everyone was invited to participate. Nevertheless, seven wanted to participate and were invited to take part in the study. Our sample size comprised 17,5% of the available population, representing both genders and different types of previous education. However, during the analysis, we experienced recurring answers among all the informants over time, signaling high saturation in our data (Jacobsen, 2016).

Although most of the informants have an engineering background, they are all from different engineering disciplines such as design, cybernetics, informatics, mechanical, and energy and environmental. Each informants' specialization is hidden through the general term "engineering" due to privacy considerations. Along with gender, the informants' general educational background is displayed in the table below.

Id	**Gender**	**Education prior to NSE**
1	Male	Health
2	Male	Engineering
3	Male	Engineering
4	Female	Engineering
5	Male	Economics
6	Male	Engineering
7	Female	Engineering

Table 4: Each informants' gender and education prior to NSE

3.2 Data collection

3.2.1 Semi-structured interviews

The data was collected through semi-structured interviews, which is considered the ideal approach for an inductive qualitative study (Gioia, Corley and Hamilton, 2013; Jacobsen, 2016). The semi-structured interviews had an open approach, focusing on some selected topics based on the feasibility study the student had gone through the previous week. Due to an inductive approach, we seldom interrupted the informants' answers. Instead, follow-up questions such as "why" and "why not" on the informants' statements were frequently used.

The interview guide experienced some development in between each interviewing round. All interviewing guides are presented in Appendix 5: Interview guides

Every informant was interviewed either three or four times over two months. This allowed for identifying how students in venture creation programs explore business opportunities and a potential change over time.

3.2.2 Carrying out the interviews

The interviews were conducted in-person during the fall of 2020. The week before every interview, every student had recently been through a feasibility study, thus having their experiences fresh in mind. All interviews were done in a closed room at NSE's offices – a location where the informant is familiar.

One of the authors conducted all interviews. In this way, we attempted to build trust between the interviewer and the interviewee, allowing all thoughts and statements to be recorded. The recording helped the interviewer concentrate on what the informants were saying, taking notes to figure out well-fitted follow-up questions. The recorded interviews were later transcribed by the remaining two authors, coded and systemized, inspired by the Gioia methodology (Gioia, Corley and Hamilton, 2013). The time and length of all the interviews are displayed in Table 5: Overview of case interviews.

Id	**Interview 1 (Week 37, 2020)**	**Interview 2 (Week 39, 2020)**	**Interview 3 (Week 41, 2020)**	**Interview 4 (Week 44, 2020)**	**Tot.**
1	20 min	11 min	-	26 min	57 min
2	21 min	12 min	14 min	34 min	81 min
3	20 min	16 min	-	31 min	67 min
4	22 min	20 min	17 min	27 min	86 min
5	15 min	15 min	18 min	-	48 min
6	23 min	15 min	16 min	24 min	78 min
7	18 min	12 min	-	33 min	63 min
Tot.	139 min	101 min	65 min	175 min	480 min

Table 5: Overview of case interviews

The covariation of duration on each interview round displays the nature of a semi-structural interview. All interviews had some constraints in terms of time and content. However, as mentioned, none of the informants were interrupted while talking.

As displayed in Table 5: Overview of case interviews, not every informant completed all interviews. The dropout situations were caused by the unavailability of the interviewee in the

weeks the interviews were planned. According to Jacobsen (2016), dropouts in longitudinal research of the same individuals are normal yet unproblematic if the dropout is unsystematic.

3.3 Data structuring and analysis

3.3.1 Drawing inspiration from the "Gioia Methodology"

To structure and analyze the data, the authors used execution techniques written in Gioia, Corley and Hamilton (2013) better known as "The Gioia Methodology". Before execution, the authors spoke with assistant professor at NTNU, Jørgen Veisdal, about techniques to pursue on the methodology as Veisdal recently had followed the methodology in Veisdal (2020).

Before starting the Gioia Methodology, all authors started highlighting interesting segments of the transcribed text (sentences, paragraphs, and other chunks of text) from all the transcribed interviews individually. This made the authors familiar with the data, allowing for more nuances to proceed into the analysis. After the analysis, we searched for relevant literature to increase our understanding within the field of research. This search helped us to discuss our results emerging from our data in light of existing theory.

From 24 transcribed interviews, a total of 1259 statements were highlighted by the authors. These statements were the foundation for the coding phase inspired by Gioia, Corley and Hamilton (2013).

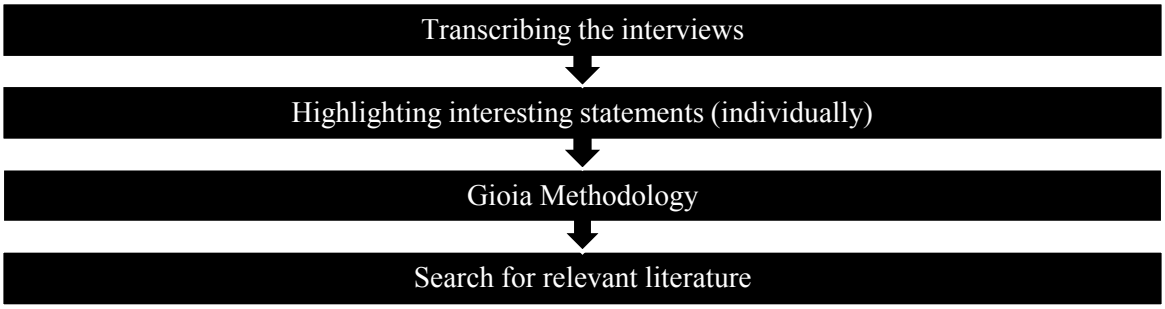


Figure 1: Data analysis structure

3.3.2 The Gioia approach to data structuring

Due to the importance of the methodology in this thesis, a brief description of the Gioia method is presented before our application of the methodology in practice is presented in this chapter.

Inductive qualitative research is characterized by complexity as the data involves a significant quantity of nuances, making it difficult to interpret (Jacobsen, 2016). Gioia, Corley and Hamilton (2013) present an approach of structuring inductive qualitative data while simultaneously developing new concepts – an essential implication to inductive analyses

(Jacobsen, 2016). The approach achieves this by staying open and informant-centric in the early phases of the process – a stage that can be characterized as overwhelming (Gioia, Corley and Hamilton, 2013). Structuring of the data – looking for patterns and similarities among the data take place later in the process.

Gioia, Corley and Hamilton (2013) emphasize the importance of being informant-centered in the early phases (particularly in the data gathering and 1st-order coding), respecting the informant as knowledge agents. By giving the voice to the informants, using the informants' statements and words, isolated from the researchers' perceptions, is exactly what contributes to discovering new theories rather than validating existing ones (Gioia, Corley and Hamilton, 2013). In the later stages of the analysis, the researchers should refine, structure, and categorize the data, first into 2nd-order categories, then aggregate dimensions. Gioia, Corley and Hamilton (2013) state that, in the final phases, the researchers must be sufficiently knowledgeable to define the concepts into relevant terms grounded in theory – gradually going from having an informant-centric perspective to a more rigorous researcher-centric perspective.

3.3.3 Data coding

The data coding was conducted during the spring of 2021 by all the authors. In line with Veisdal (2020), rooted in the Gioia Methodology, the data was coded in four levels – gradually condensing 1st-order concepts into theoretical subcategories, further into theoretical categories, and finally aggregate theoretical categories. We had a goal to highlight as many nuances of the data as possible as the researcher's interpretation of data can act as a threat to the internal validity of the study (Jacobsen, 2016).

From all highlighted statements, every author created 1st-order concepts independently from each other with no, as Gioia, Corley and Hamilton (2013) recommended, predetermined rules for coding. During this phase, we discovered that most of the statements had been highlighted by all authors in the preparatory phase. This indicated a shared perception of which statements seemed important for the analysis. Further, it gave a sense that all important data had been considered.

Everything the informant said about any dimensions affecting the previous feasibility study was given a label using the informants' own words whenever possible. However, as all interviews and transcription were conducted in Norwegian while the analysis is in English, some words, hence nuances, might have been influenced by the authors' translation of the data to English. Further, lengthy statements were also shortened to enable progression in the

analysis. From 1259 highlighted statements, a comprehensive shared compendium of 647 1st-order concepts was created in the first round of analysis.

With a shared compendium, the authors individually read through all the 1st-order concepts to get a holistic overview of the data – offsetting individual ideation of how these concepts can be grouped to structure the data further. When reading through the compendium, the authors noticed several of the 1st-order concepts had similarities, resulting in a grouping of all overlapping 1st-order concepts, resulting in a final 206 1st-order concepts.

From the compendium read-through, the authors discussed and wrote down tentative grouping names each author had ideated during the read-through, later conceptualized as theoretical subcategories. Similar to Veisdal (2020), we added an additional step in our data structuring. As Gioia, Corley and Hamilton (2013, p.20) state: "You gotta get lost before you can get found". By recursively working back and forth between the 1st-order concepts and the theoretical subcategories, we accumulated the theoretical subcategories into theoretical categories representing the subcategories by gradually reding literature. In the next phase, we gradually read more theories to develop our theoretical categories into theoretical aggregated categories. The entire coding process is summarized in Figure 2: Coding process.

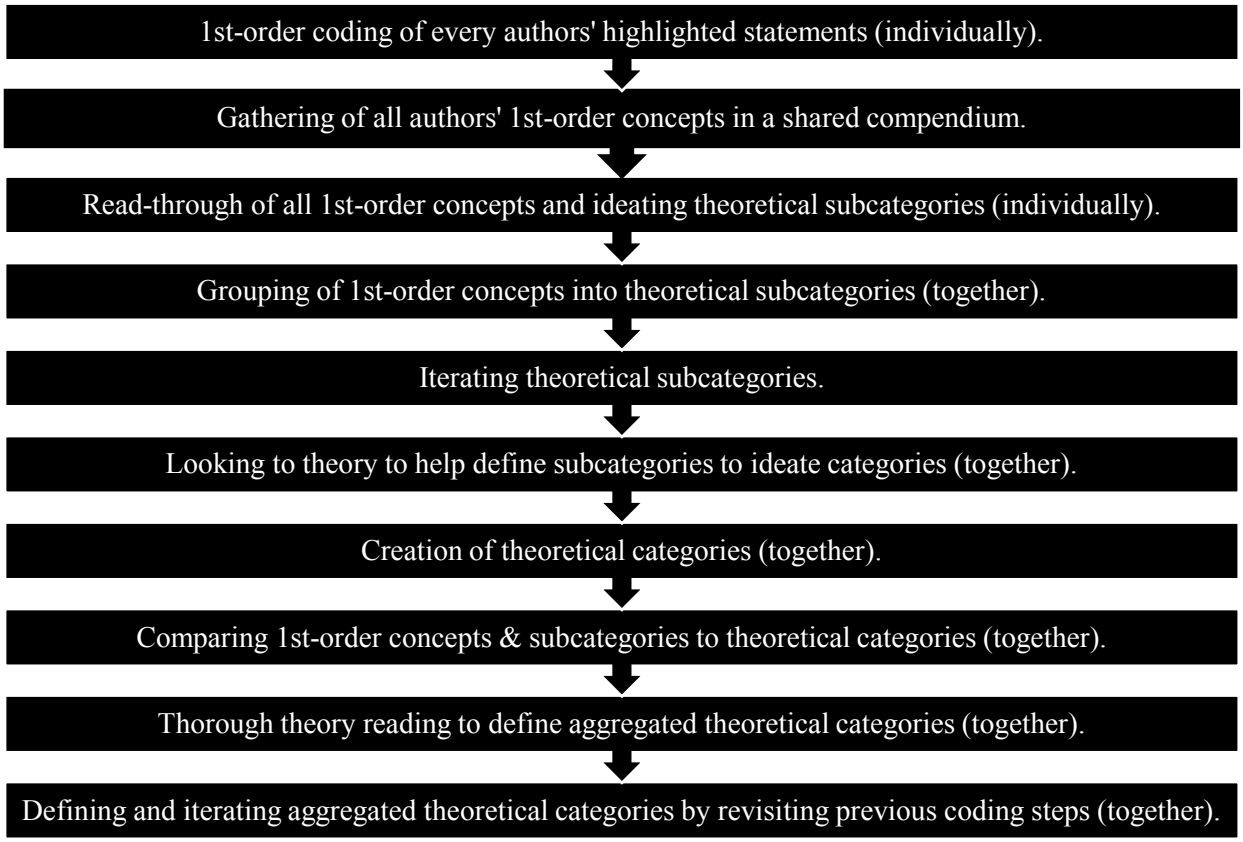


Figure 2: Coding process

A sample of this structure is visualized in Figure 3: Segment of the data structure, visualizing how a set of 1st-order concepts ultimately ended up describing one theoretical aggregated category following the Gioia Methodology (Gioia, Corley and Hamilton (2013) inspired by Veisdal (2020). The entire data structure is presented in Appendix 6: Data analysis.

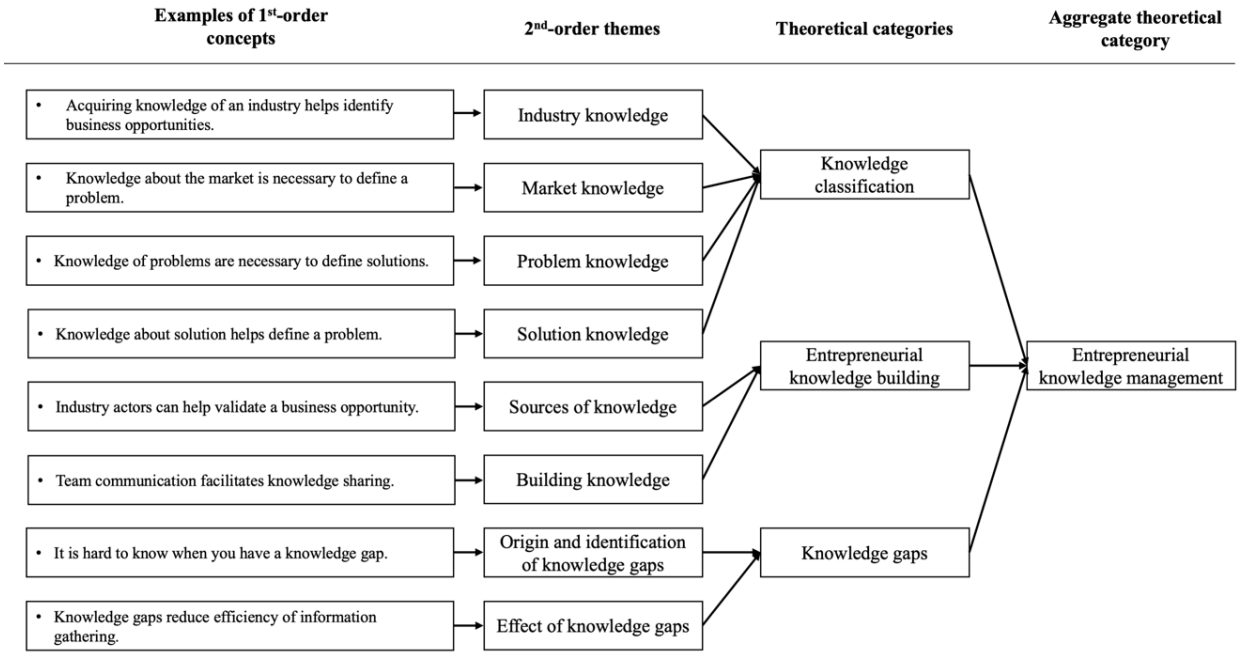


Figure 3: Segment of the data structure

3.3.4 Data analysis

Following Gioia, Corley and Hamilton (2013), the data analysis takes place during the data structuring. However, as we experienced a lack of knowledge within the field our data was leading us, we needed to take one step back to answer: "What is going on here"? (Gioia, Corley and Hamilton, 2013, p.20).

Simultaneously as the search for potentially relevant literature began, we followed techniques described in Patzelt et al. (2014): reading and rereading our transcribed interviews, coding, and recoding the data in an iterative process. We revisited the 1st-order concepts to control their relevance for the subsequent conceptualizations. The formation of the aggregated dimensions emerged gradually the more literature we read and the more familiar we became with our data.

In total, after seven iterative recoding phases of forming new and merging existing theoretical subcategories, we finally ended up with thirteen theoretical categories describing our three theoretical aggregated dimensions; Entrepreneurial teams; Nascent entrepreneurial feasibility method, and Entrepreneurial knowledge management. These three categories lay the foundation for the structure of our findings, more thoroughly described in section *4 Findings*.

3.4 Strengths and weaknesses of the method

3.4.1 Personal experiences of the area of investigation

All the authors behind this master thesis are graduating from NSE in June 2021, meaning we all have our own experiences and perception of what we are investigating: nascent entrepreneur in the VCP of NSE. This might have influenced the data gathering, structuring, and analysis in both positive and negative ways.

Being familiar with being a freshman at NSE, we could get a deeper understanding of the informants' statements and what topics could be the most interesting to investigate. Most affected by this are probably the formulation of the interview guide, carrying out of the interviews, and interpretation of the data.

The authors' preexisting experience might have enabled a richer insight of the area as the informants' statements could be related to, thus supplemented, with own experiences. However, our previous experience has some drawbacks. There is a chance all of the authors have been suspect to an interpretation bias of the data: we unconsciously gathered and interpreted the data we perceived as interesting. This is a threat to study as inductive methods are characterized by researchers having an open mind and letting the data speak for itself (Jacobsen, 2016).

To handle this threat to the study, we strived to isolate our perceptions, stayed informant-centric during the analysis, and enforced our data as the only representation of the phenomena. Further, the interview guide facilitated an open approach to the data gathering, emphasizing open-ended and follow-up questions.

3.4.2 Closeness to the informants and the context

When the data gathering started, the informants had enrolled to the program approximately three weeks earlier – meaning the authors had become familiar with the informants before the study started. Regardless of the ongoing corona pandemic, the authors were present at the NSE offices during all the feasibility studies where the feasibility studies were conducted. Hence, we observed the informants while they were going through the feasibility study as it was happening. Due to this closeness, we were able to compare our observations with what the informants shared during the interviews and controlled that the pandemic did not cause any disruptive noise.

Although the informants were encouraged to share honest and true reflections, there is a chance the informants' statements were affected by the fact the interviewer is a senior student and the interviewee a freshman – promoting a participation effect (McCambridge et al., 2014). On the other hand, as the authors were present during the feasibility studies, we were able to challenge the interviewees with observations we had done during the feasibility studies.

Literature refers to closeness as a natural part of qualitative studies and unproblematic if the researcher can maintain a critical distance to the data (Jacobsen, 2016). By applying intercoder reliability throughout the entire analyzing phase, we have been able to act as each other's "devil's advocate" in the perception of the data (Gioia, Corley and Hamilton, 2013; Olson *et al.*, 2016).

3.4.3 Longitudinal design

Longitudinal research designs are suitable for discovering covariation on different conditions over time and determining causality if causes occur before the effect in time (Jacobsen, 2016). However, as the data gathering followed an inductive approach, we were unbiased towards what conditions we wanted to discover, thus what theoretical assumptions to infuse in the interviews. This strengthened the inductive design. However, it disabled us to yield on the longitudinal design.

As the data analysis was conducted in line with the Gioia Methodology, theoretical assumptions regarding effectuation emerged. In retrospect, if we had had a greater understanding of these theories before the data gathering, we believe that we perhaps would have reframed the topics and questions in our semi-structured interview. Thereby we could have identified greater causal coherences and longitudinal changes in the students.

4 Findings

In our study, a multitude of angles and patterns in nascent entrepreneurs' exploration has been uncovered.

The mere size of the underlying data has given room for several different approaches to analysis. However, three main topics emerged as aggregate theoretical dimensions through the Gioia Methodology and will be presented in this chapter. They are entrepreneurial teams, team-based exploration process, and entrepreneurial knowledge management. To enrichen the Findings chapter, we present informants' citations and statements from the semi-structured interviews.

4.1 Entrepreneurial teams

This chapter displays the students' reflections regarding the teams they were working in during the feasibility studies and how these characteristics affected the feasibility studies. The findings are divided into three subchapters: team composition, team structure, and the team functioning level. We find these subchapters highly interrelated.

4.1.1 Team composition

To describe their team's composition, the students classified the team as either homogeneous or heterogeneous. Heterogeneity and homogeneity in a team are reflected through the team's personalities, work preferences, academic background, and work experience. They also mentioned the skillset of the team that contributed to the feasibility study. Skills were defined as the team's abilities and were not correlated directly by whether the team was homogeneous or heterogeneous.

4.1.1.1 Heterogeneous teams

Background heterogeneity gives interdisciplinarity, and the importance of interdisciplinarity is unambiguously agreed upon. The students found interdisciplinary to improve the quality of the feasibility study as it allowed for a broader knowledge base within the team, such as this informant express, «*We were a good mix of backgrounds that worked well together and complemented each other».* However, heterogeneity seems to increase misunderstandings in the team. This informant describes how the interdisciplinarity in his team affected the teams' cooperation: *«In the beginning, there was a lot of conflict and misunderstanding in our team. However, as our understanding got more aligned, the discussions became constructive».* Ultimately the team became aware that their diverse backgrounds affected how they interpret

information and created misunderstandings. When they addressed the issue by creating a common understanding, they could reap the benefits of diversity by unlocking multiple perspectives in the information they had gathered.

By having heterogeneous personalities within a team, a natural dynamic seemed to arise, reducing the need for formal team roles. This enabled teams of strong personalities without non-productive conflicts, as suggested by this student: *«Although our team had very different personality types, we never experienced any conflict as a result of this».* These teams seemed to balance each other's personalities: *«Some team members were more outgoing than others and it worked well».*

The students found the effect of heterogenic work-preferences to be more case-specific. The work preference, in general, should match the nature of the case. For example, if it is necessary to gather loads of data, it is positive to have someone in the team with a work preference for data gathering: *«One in the group has a background from data and he is very analytical. Therefore, he sat and gathered lots of useful data instead of gathering information through phone-calls».* However, if an individuals' work preference does not fit the case and overall group plan, the individual member may feel demotivated: *«I feel discouraged when others want detailed plans for what we should pursue while I just want to have an open mind and let the process flow».*

The general opinion from the students is that heterogeneity of work-preferences is not directly positive. However, it seems like a beneficial way to ensure that all essential areas of a case are met during the feasibility study: *«Some were very energetic and just started gathering information, others were more "under the radar" who revised and controlled the energic individuals. In retrospect, it worked very well».*

In general, we found heterogeneous teams to have a greater chance of discovering business opportunities. In heterogeneous teams, team members can complement each other's competencies making every team member more eligible to investigate areas they previously lacked knowledge of. This promoted efficiency as it made the team generate valuable leads more quickly. It also facilitated a shared understanding helping to reduce future conflicts.

4.1.1.2 Homogenous teams

For teams with a homogenous background, communication became more straightforward as the team members quickly understood each other. Specific domain terms did not require any further explanation within the group, reducing misunderstandings and promoting effective

communication: *«We were all technically competent people who were always on the same wavelength when we discussed solution».*

However, homogeneity and effective communication come at the cost of a narrow focus. The homogenous teams tended to spiral into deep unproductive work sessions of details: *«As we had mostly economists in our team, we got obsessed with making highly detailed financial forecasts».* Due to a lack of interdisciplinarity, the students were less likely to investigate other areas than those they already had knowledge of.

As homogenous teams were good at understanding each other, emerging conflicts evolved into lengthy niche discussions. The students agreed that although these discussions were interesting, they were not beneficial: *«Being only engineers on the team, we rarely misunderstood each other and enjoyed discussing (...) however, I feel a non-engineer could have broken up the discussion and ensured progression»* – implying that homogenous teams misspend time and are less likely to notice when this occurs.

In homogenous teams, the students experienced strong personalities to hamper role defining, causing conflicts to emerge, decreasing the teamwork productivity, or as one student describes: *«I felt that everyone in the group had very strong personalities, which made it difficult to define roles causing heated discussions, it made the teamwork challenging»*. Instead, students in homogenous teams often filled the same roles in the team, which ended up becoming inefficient and sometimes conflict generating. Several students agreed that teams with strong personalities made the teamwork more challenging and lead to discussion standstills. One student explained how several strong personalities in their homogenous team caused the teamwork to collapse: *«There were very strong personalities in the group, so it was difficult to come up with constructive suggestions to change things. This led to a real team breakdown».*

4.1.2 Team skills

Our findings suggest that team skills are beneficial and available in both homogeneous and heterogeneous teams. The skills highlighted through the interviews involve information gathering, rapid prototyping, feasibility testing, teamwork, and execution. All were mentioned by the students to increase the quality of feasibility study by creating a deep understanding of the business idea. One student emphasizes the benefit of having different types of skills within the team this way: *«We had different skills within the team which benefited the outcome of the feasibility study».*

By having specifically prototyping skills in the team, the students could quickly create something visual that helped informants grasp the concept the students were testing. This enabled more extensive information gathering and increased the quality of gathered information. On the other side, the absence of prototyping skills made information gathering harder. One student described the importance of prototyping skills in these words: *«At one point potential customers we talked to wanted to see a prototype of the product before they could share real commitment for the business idea».*

Information gathering skills were described as the ability to access and manage information from external sources through conversation, usually phone calls. The skill is described by the students as a core skill of a feasibility study. The best way to increase this skill is to perform feasibility studies and gain experience: *«It is not easy to interview and I do not have much experience with it either (...) at first I was very nervous when I called people, but gradually I become more comfortable and better at it».* With increasing information gathering skills, the students' confidence in conversations increased, they formulated questions better, timed follow-up questions and adapted their approach to better match the informant: *«by giving the impression of having authority and knowledge of an area, you will get high quality information faster»*, *«I adapt my behavior based on who I am talking to».* Another skill students mentioned was the "execution skill". They explained that this skill was highly correlated to feasibility progression. One student explained the importance of execution this way: *«If you hesitate because you don't like calling, then that is exactly what you must start with, do not postpone it until later!».*

Teamworking skills, defined as "being able to cooperate, regardless of whom you are working with", is highlighted as an important skill in a feasibility study. Since the feasibility studies are performed in teams, one of the students explained: *«Teamwork is the key to progression, you got to figure out how to cooperate, it's decisive for the outcome of the feasibility study».*

4.1.3 Team structure

4.1.3.1 Feasibility study roles

The students recognized two different team roles frequently appearing within the teams: "the control-role" and "the critical-voice-role". Common for them is that they do not exclude each other, meaning one individual can have both roles. Other roles were mentioned to some degree, such as an "information-gathering role" and "information structuring role", but unfortunately,

they were not mentioned to the extent that it is possible to describe them with adequate accuracy nor depth.

The “critical-voice-role” is understood as “the devil’s advocate”, pointing out flaws and faults, second-guessing and questioning the information gathered: *«I was perhaps the critical voice that kept us down to earth».* The role was not formally given but was an outcome of an individual's work preference and choice of focus, such as one of the informants said: *«I continuously tried to question and reflect upon what we were doing to keep us on the right track».* Being a “critical-voice” is not an exclusive right, nor a role that was prevalent for every team. However, when this role was employed, it helped the team search for new perspectives, reducing the chances of following a path into a dead end.

The “control-role” is another emerging role of feasibility study teams. A key feature of this role is to keep track of time and enforce the planned strategy, or described by one of the students: *«I made sure that we did not forget anything important, that we conducted meetings regularly to share information, conducted all planned breaks, and kept track of the structure».* The “control-role” were regularly associated with the “team leader”, but the role can also be fulfilled by one or several individuals of the group: *«I don’t think I was the leader of the team. However, I continuously kept an overview of the process as a whole, making sure we stayed on topic»*.

4.1.3.2 Leadership role

The leader role is described as one individual within the team who ends up possessing one or several leading attributes described in the previous chapter. The leader was either chosen formally, informally or emerged organically as a result of chaotic events. In this chapter, we have divided the leadership role into “formal leader”, “informal leader”, and “the chaos management leader”.

The students described a more frequent occurrence of informal leaders rather than the formal leader. The students explained informal leaders as individuals with both knowledge and passion for the case, who take the initiative of sparking discussions and making decisions. These individuals were often the “idea owner”: *«I became a kind of a leader in the group because that was my idea».* The role was never explicitly defined, but when one individual was the more knowledgeable and passionate, no other individual questioned the role, as described by one of the students: *«He took more responsibility as he had great passion and knowledge of the case».*

In other feasibility study teams, the students described electing one person to have a formal leading role before starting the feasibility study. One of the students were elected as he had experience adopting an informal leader role: *«This was the first team I have been in where we chose to elect a formal leader (...) As I possessed an informal leading role the previous feasibility study, I were formally chosen this time».*

If no leader, either formal or informal, had emerged, this could lead to a lack of structure and result in chaos. The students experienced chaos to correlate with group size, determining the necessity for a leader. This chaos often unfolded as a heated team discussion that failed to achieve a joint agreement. If such chaos occurred, the students described a phenomenon that can be understood as a "chaos management leader" one student described this phenomenon with these words: *«Heated disagreements can occur in all teams – sometimes you need someone to just make a choice in order to proceed».*

The "chaos management leader" steps up as a temporary leader to mediate the situation, helping the group move forward and put disagreements aside. The following quote describes how one of the students adopted the role: *«At one moment, two team members started arguing about something irrelevant (...) I stepped up and took a mediating role to calm the situation and ensure productivity»*. When the situation has calmed down, the role disappears and only reappears if necessary. However, the next time, it can be another person who takes the role.

Although leadership seems to enable structure and efficiency, the absence of a leader does not seem to worsen the outcome of a feasibility study. The students emphasize the importance of balancing between chaos and control in order to maintain team motivation. If there is a leading figure within the team, this person needs to have control to ensure progression but not at the expense of productive discussions, as one of the students emphasize: *«A feasibility process demands some autonomy and authenticity. Too defined commands from one leader decrease team motivation»*.

4.1.4 Team functioning level

Team functioning level can be described as how the student teams cooperate in a feasibility study to identify a business opportunity. As a feasibility study in this context is conducted in teams, the outcome of a feasibility study is highly correlated with the teams' performance throughout the week. The students had many opinions on teamwork and whether the teamwork was productive or not. This is summarized in two chapters: low functioning teams and high functioning teams. Both chapters present the students' perceptions of what characteristics both

teams have, what effect they can have, and what efforts the teams pursued to improve their functioning level.

4.1.4.1 Low functioning teams

The students described a low-functioning team as a team unable to work well together. The students' characteristics for low-functioning teams involve lack of communication, inability to cooperate, inability to withhold a structure, and a generally bad atmosphere. One student described a low functioning team this way: *«Poor cooperation, no team synergies and a lot of negativities within the team, it was a horrible week».* Being in a low-functioning team creates frustration, reduces well-being, and impairs performance. The lack of motivation reduces the quality of the feasibility study or, in the worst case, disable the team to identify business opportunities: *«There are some people you simply do not work well with. After the first day, I knew this team just wouldn't be able to identify a business opportunity».*

The students also described how a lack of structure in workflow could create friction within the team. For example, some prefer to work mostly individually and only have meetings at specific times or when it is utterly needed, while others prefer continuously cooperating and updating of each other: *«I don't know why, but one team member were rarely present, it made continuously sharing insights within the group challenging»*. Several students emphasized the importance of knowing each other socially before the feasibility study as it can ease the communication throughout the week: *«I guess if we had known each other better socially before we started working, we might have been able to communicate more openly».*

Lack of team loyalty was shown in different situations such as neglecting the strategy agreed upon in fellowship, exemplified through the two following quotes: *«I worked on what I believed would be important, rather than what the team decided together»*, *«We divided the calling list between us, but when I returned from my calls, half of the group had not even started on their list»*. Observing that one or several team members had acted disloyally, the general trust within the team eroded. Students observed that this simultaneously lowered the threshold to be rude to each other and show discontentment, drastically reducing teams' motivation and skyrocketing frustration: *«There were a lot of interruptions and frustration. People easily got annoyed with each other in this team»*.

Another frequent explanation from the students was that low team functioning often was caused by overwork. Overwork could appear as a commonality for the team or affect one or a few individuals. Overwork reduced the efficiency in their work: it created frustration and could

spark unproductive arguments. The threshold for overwork was greatly individual and varied from one team member to another.

Another repeating reason for a low functioning level was the team members' inability to cooperate and work together. The students often mentioned that this arose together with the sense and feeling of a generally bad team atmosphere and lack of team chemistry: *«The energy level within the team affected the team dynamics»*. Dysfunction in teams seems to worsen further its functioning level: *«Its easier to get annoyed by your team members when the teamwork does not function well».*

4.1.4.2 High functioning teams

In contrast to low-functioning teams, the students experienced a "high-function team" as a team where communication floated smoothly, and the demand for a rigid structure was less prevalent. Cooperation feels easy and rewarding, the team atmosphere is open and friendly, and the team thrives together: *«Our communication and overall teamwork worked really well, resulting in a high degree of autonomy»*. In these teams, formal team roles are less prevalent. Instead, they seem to be characterized by a dynamic approach to roles during the feasibility study as the team members are open and patient with each other – both increasing the teams' motivation: *«In teams that work well, group members are good at listening to others' opinions, reflecting in silence, before agreeing together»*. High-function teams promote both quality and efficiency and are deemed necessary in order to identify a business opportunity during a feasibility study.

The students emphasized the importance of social relations in order to promote the team functioning level. They mention social activities as important to form social bonds and relations within the team, enhancing team communication: *«The weekend before the feasibility study, the team did some social activities within the group. This was valuable to create a good team atmosphere and create a basis for cooperation»*. Working on a team atmosphere, team trust, and team communication increases the team's motivation and helps bolster the functioning level. By having a good atmosphere, the students relaxed more, felt comfortable, and could more easily achieve a good workflow: *«Good atmosphere among the group members resulted in better workflow and fewer conflicts»*.

Constructive feedback is something that often is mentioned to increase the team members' understanding of each other, facilitating improved team communication – making the team function at a higher level: *«We exchanged both constructive and positive feedback. It made us*

collaborate even better». Being honest and open with each other also facilitated the students to learn how they can change in order to improve: *«Constructive feedback from team members really helped me understand how I could improve and change to the better».*

Clarifying the team members' expectations helped increase the functioning level by letting team members express their feelings and feeling heard. This increases their motivation for the feasibility study and makes the results of the feasibility study more trustworthy. Individual passion for a business opportunity has also been found to increase the teams' motivation.

4.1.5 Summary of Entrepreneurial Teams

Our findings show that there are several characteristics within entrepreneurial teams that affect whether a business opportunity is discovered or not. Concerning homogeneity and heterogeneity in teams, it seems to affect team communication and the teams' ability to identify a business opportunity. Further, having a set of skills, such as rapid prototyping, is highly beneficial. What is interesting about skills is that they seem beneficial regardless of whether they were homogeneous or heterogeneous.

The team composition was highly related to the team structure. All teams experienced some team roles during the feasibility study. These positions were either formally or informally chosen or emerged due to events occurring in the team.

Team composition and structure seemed to both influence the overall team functioning. The team functioning phenomena are illuminated as positive and negative "spirals" where low team functioning level further decreases team functioning, while high team functioning level further elevates team function.

4.2 Team-based exploration process

This chapter describes the students' reflections with regards to the process they were going through in their feasibility studies. The chapter is divided into three subchapters: business ideas, team-based feasibility study, and feasibility study tools.

4.2.1 Business ideas

The students described a common start and goal for all the feasibility studies. They started with a selection of a business idea, and the goal was to validate the idea and end up with a viable business opportunity described through a business model.

4.2.1.1 Selection of business idea

The selection of the idea reflects the earliest phase of a feasibility study before an idea is selected for a feasibility study. There were four aspects the students considered when selecting a business idea: Passion for the case, prior knowledge, external feedback and the stage of the idea. None of the aspects were absolute, but they were all unambiguously positive if considered.

However, passion for a business idea seemed like the most important criterion for selecting a business idea: *«Passion in the group should weigh heaviest in the choice of idea for feasibility study»*. The students experienced that it was sufficient if at least one person had a passion for the idea: *«I can work on something I don't cherish as long as I know that someone on my team is really passionate about it»*. The students mentioned that they chose a business idea because one team member possessed knowledge about. This knowledge could either origin form specific university subjects or previous feasibility tests. When passion was not mentioned, the students included some mentors for sparring before deciding what business idea to select.

Common for the students is that they preferer to test open, early-stage concepts instead of ideas that they experience as mature and rigid: *«The idea had come too far for a feasibility study»*. Moreover, business-to-business (B2B) were seemingly favored by the students as *«B2B cases depend more upon hard facts linked to the identified problem»*, and *«it is much easier to identify and get hold on B2B customers compared to B2C customers».*

4.2.1.2 Validation of business idea

Validation of business idea is meant as the conclusion the students do upon an idea tested, hence, to decide whether it is an idea worth pursuing. All the students said that information from the customers was essential to identify the potential of the business idea and thereby validate it as a business opportunity. The students repeatedly highlighted three perspectives of an idea that must be investigated before a business idea can be validated:

1. There must be a problem that needs a solution: *«It is important to identify a need, and whether the solution can be made», «It is important to verify that a solution to the problem is needed», «The solution of a problem is irrelevant if no one wants to pay for it»*.
2. To create a solution that can meet the needs of the customers, it must be realistic: *«Although the details of a solution are unimportant, to begin with, it must be realistic that it can actually be created»*, *«It is important to think about whether your tentative*

solution actually can be made; hence, you must know if it is possible to make the product».

3. Customers must be willing to pay enough, so it yields a sufficient margin to build a business based on it: *«There is not much point in investigating the idea further if you know that it is not profitable anyway», «The business idea itself was ok, but the financial aspect made it unattractive»*.

4.2.2 Team based feasibility study

4.2.2.1 The workflow

The feasibility process is found to be most efficient when it is structured in a way everyone knows what to do and when to do it. Students emphasize the value of having a shared plan for the feasibility study: *«Before starting the feasibility study, we usually create a plan to frame our scope».* Having regular team communication helps increase efficiency by pulling the team together in one direction.

Students experienced sequential workflows as optimal, containing cycles of different tasks, such as gathering information (preferably through phone calls), condensing the information in a resume, team discussion before repeating the cycle: *«You have to balance between gathering as much information as possible and trying to get an overview determining "what this information means" in order to yield on it»*. The different phases of the feasibility process have different sequential work phases. Common for them is that they distinguish between individual work like writing a text or making a phone call, and work with the team such as discussions and meetings: *«The information every group member gathered was discussed in the team to figure out what we need to find out next.»*

One activity which the students observed as beneficial for the abovementioned cycle was to work on the ideas' business model continuously and study how new information might reshape it. In the following quote, one student describes how the business model can help determine the potential of a business idea: *«An early, open and dynamic approach to the business model can help determine whether an idea can turn into a business opportunity».* The students experienced that business models often take time to develop as they require a lot of information and are a somewhat iterative and continuous process: *«It took some time before we realized that there were several business models for the case», «We concluded our business model way to early. In retrospect we should have challenged it more».*

The students described an unstructured process to be a recipe for chaos. Chaos can make the team pull in different directions, thereby stagnating progression *«We followed an unstructured process resulting in misunderstandings that decreased our efficiency»*. Lack of regular team communication can further worsen chaos and create a "every man for himself"-culture driving the team into a dead end: *«I think we worked too much on our own leads because when we shared our findings, we were unable to adapt to new insights.»*

A narrow focus, using energy on details can create a tunnel vision where only one perspective is explored. Therefore, the team ends up overseeing better opportunities. Also, it is mentioned that too much focus on a particular part of the feasibility study is counterproductive and time-consuming: *«In the beginning there was a lot of uncertainties and by focusing on details and not addressing the uncertainties, we couldn't get a good view the entire picture».*

4.2.2.2 Decision making

We found team knowledge, motivation, and communication to be the most frequent implications for decision-making processes and outcomes. As feasibility studies at NSE are limited in time, making decisions are an essential element in a feasibility study to enable progression. The time constraint made the students make decisions they might regret later.

The students emphasize excessive information gathering as a negative factor for decision making – especially when the group either fails to find the necessary information or the groups fail to make decisions with incomplete information. The latter is rather frequent as the students experience that a decision will always be prone to uncertainty and incomplete information: *«To decide, you need to balance between gathering new information and using the information you already have».*

The students described that information gathering could reduce uncertainty but rarely remove all uncertainty, transforming the uncertainty into a risk: *«We try to decrease as much uncertainty as possible, making uncertainties become more like a risk»*. Often, they must rely on the information they have access to and try to make the best out of it: *«You need to make a decision based on limited information in order to proceed»*.

4.2.2.3 Biases

The student describes biases as a disabler for discovering business opportunities. They usually observe other team members' biases but fail to spot their own. The biases they describe can most commonly be understood as confirmation biases. This bias results in a tunnel vision that prevents students from discovering and exploring alternative perspectives. We found two

dominant ways that confirmation biases occur during a feasibility study, shown in Table 6: Biases and critical mindset.

Biases	**Origin of bias**	**Critical mindset as bias mitigator**
First source of biases	During information gathering, the students talk to informants with confirmation biases that they pass on in the information they give to the students: *«Informants might share information that is distorted to create an image of themselves as more knowledgeable than they actually are».*	By reflecting and discussing within the team, they determine to which degree they have interpreted the information correctly: *«We gathered views and information before assessing whether it was worth listening to».*
Second source of biases	The students' preexisting knowledge of a specific area affects the processing of information they gather in an illogical way: *«It's difficult to balance between verifying my assumptions and at the same time staying objective».*	By cross-checking the gathered information with multiple sources, the students seek to decrease the informant's bias: *«The information I gather from one informant must be confirmed or refuted by others before I can denote it as a truth».*

Table 6: Biases and critical mindset

The students experienced that having less knowledge about the area they were investigating could help reduce their own biases. However, recognizing the informants' biases could have been more difficult: *«If I contact someone in an industry I'm not familiar in, I might interpret the information differently than someone familiar with it. I guess it can be both an advantage and a disadvantage».*

The students also mention the risk of creating "absolute truths" by manifesting themself through explicit sentences written down in the feasibility report or other documents used by the team to keep an overview of information. Ownership to own work, or overly positive feedback from informants: «*Writing something down in the feasibility report can suddenly turn it into a truth, making you less open for new or contradictory information».* "Absolute truths" can falsely validate or invalidate a business opportunity. Common for them is that they cast a

shadow that turns other information somehow irrelevant or makes the team neglect new information they gather.

4.2.3 Feasibility study tools

Students particularly mentioned using hypothesis and network as the two most essential tools during the feasibility studies.

4.2.3.1 Hypotheses

A common part of the feasibility process is the widespread use of hypotheses: *«I think structured use of hypotheses is a crucial tool in feasibility studies».* The hypotheses are formed as questions or statements by the students. They are continuously built based on available information and the teams' experiences of what information is required to identify a business opportunity: *«The team got together and created hypothesis that represented what we knew, thought we knew and what we needed to find out».* This helps create a structure that makes the team pull in the same direction: *«Hypotheses really helps create structure in the feasibility process.».* By using hypotheses, the teams can easily track progress and see results from their work which positively affect their progression: *«Hypotheses clarified what we know and what we should focus on figuring out».*

4.2.3.2 Network

The students used networks to gather information, test hypotheses, and get access to a greater network of new relevant informants – creating a new path for the feasibility study: *«The reason for our decision to pivot was based on external input from informants».* The students' preexisting network is described as beneficial for a feasibility study: «*By already having a network within an industry you are testing; you just get to what you want to know faster».*

Students find building networks as time-consuming but highly rewarding. They experienced that network built through one feasibility study could become relevant later in another feasibility study: *«I had a network from a previous feasibility study in the same industry.»*

The informants were usually characterized as industry experts, industry actors (users, customers, suppliers, or competitors), or a state official without direct commercial interest. The access to a network of information usually originates from family: *«I regularly use a family member of mine, he has a large network and great tips to whom I could contact»*, or friends and acquaintances: *«I know a guy who has a really big network, he helped connect me with people that were highly relevant for our case».*

Upon request from students, nearly any informant would help get the students in contact with people they know to be relevant to the business idea: *«I did not have any networks relevant to the case, but I got it quickly»*. As soon as the student found one source to information, it was easier to gain access to a network of informants: *«When we called around, people often said they were not the right person to talk to, but once we found the first person who could help us it was easier to find more of them».*

Information from informants was key to decision-making during a feasibility study: *«Networking is a game of probability, contacting more people increases the likelihood of hitting the jackpot»*. Due to comprehensive investigating during a feasibility study, the students experienced surpassing the knowledge level of the informants they contacted: *«Within a week, we built more knowledge about the problem than the industry experts we called»*. However, one student emphasized the importance of having some prior knowledge before potentially shattering one decisive informant: *«If you call an industry expert without having done any research in advance, best case scenario they will laugh and tell you to read up before calling them back, worst case scenario you have just burned a valuable source of information».*

"Mentors" was an often-used term to describe more reachable sparring partners and is an important part of the network. In contrast to the network described earlier, mentors are here defined as informants emerging from NSE, such as senior students, alumni students, and VCP staff who incorporate student assistants and faculty staff.

The mentors are characterized as talking partners who know what a feasibility study comprises and are frequently available for a quick unpretentious sparring session: *«If we were unsure about which path to take in a feasibility study, mentors would help guide us when we were stuck.».* More specifically, due to the mentors' experience with doing feasibility studies, they were able to provide information and guidance which directly impacted the feasibility study: *«fifth-graders repeatedly helped us to reflect on our idea» and «alumni students were both friendly and shared tips and tricks of what we should do next».*

VCP-staff were mentioned as crucial for feedback on the business idea, helping students choose what to focus on during their feasibility studies: *«Before we decided what idea to test, we discussed a lot with the faculty staff».* Along with the faculty staff, student assistants were used much for the same purposes – they regularly checked in on the teams, aiding whatever the team needed help for: *«We used the student assistants a lot, especially when we got stuck, it was very helpful».* Common for the VCP staff was that they always were available: *«We could*

always reach out to the student assistants and faculty staff when we needed help, even after 23.00 in the evening».

4.2.4 Summary of team-based exploration process

The overall goal of the feasibility study is to identify a viable business opportunity. In order to do this, the students start to identify a potential business idea before attempting to validate it. When doing this, the students follow a process with fluctuating levels of planning. The students experienced having a shared plan to benefit progression and as a mediator for preventing chaos. However, overly detailed planning seems to stagnate the teams' ability to change.

Making decisions is a crucial part of the feasibility study. Its outcome is highly affected by the teams' insights before decision-making. Due to time constraints, the students must make a decision based on limited information. Further, both students and informants can create biases – threatening the validity of the gathered information.

In order to make a considered decision, the students benefited from generating hypotheses and either confirming or denying these. The teams' network, comprising people outside the team, acts as a source of new information.

4.3 Entrepreneurial knowledge management

This chapter outline the students' reflections on what knowledge the students deem important in a feasibility study, how the students build this knowledge, and what barriers the students experience when trying to build knowledge. From the students' statements, three chapters emerged from the data: knowledge classification, building knowledge, and knowledge gaps.

4.3.1 Entrepreneurial knowledge classifications

This chapter outline the students' reflections on what knowledge the students deem important in a feasibility study, how the students build this knowledge, and what barriers the students experience when trying to build knowledge. The findings in this chapter are divided into three subchapters: knowledge classification, building knowledge, and knowledge gaps.

4.3.1.1 Industry knowledge

The term industry knowledge is used when explaining the general business area that a feasibility study aims to explore within. When used by the students, there is a consensus that industry knowledge sums up relevant knowledge that answers the "How" and "Why" of different actors within an area of business. Our findings suggest it is sufficient if one person in the team possesses this type of knowledge to discover the business opportunity: *«The reasoning*

for choosing the case was that a team member had great knowledge of the power system industry in Norway».

The students felt an increasing sense of responsibility the more knowledge they gained about the industry: *«I took more and more responsibility during the week because I learned a lot about the industry throughout the week»*. This indicates that industry knowledge is important for the efficiency and outcome of a feasibility study. The total accumulation of industry knowledge increases the efficiency of obtaining new information, implying that a lack of industry knowledge results in an extensive process of gathering information: *«When we left the case, we stayed in the same industry as we had accumulated a lot of knowledge within that industry»*.

4.3.1.2 Market knowledge

Market knowledge is used when the students explain market actors such as customers, users, suppliers, and competitors. The term is within the boundary of what affects the economic potential of a specific business opportunity. The case-specific nature is what separates market knowledge from industry knowledge. While industry knowledge is general, market knowledge comprises parts of industry knowledge that are specific for a business opportunity: *«It is very important to build knowledge about the market. You have to find out if "this" is just a concept or an actual business idea».*

The students remarked that knowledge of the market is necessary to define both the problem and the solution: *«Knowledge of solution and problem comes from the market»*. Market knowledge seems to be a key component in a feasibility study, so if the team lacks this knowledge, they must perform an extensive information gathering. The gathering and building of market knowledge take time because it is time-consuming to recognize which actors a market consists of: *«We spent a lot of time finding information about the actors in the market».*

4.3.1.3 Problem knowledge

Problem knowledge is used for describing the potential customers' problems in a specific market. Some of the students switch between the customers' problem and the users' problem. However, the common boundaries for the term can be explained as "why someone would pay and what would they pay for?". According to the students, knowledge about the problem does not include any solution or even an idea of a solution: *«One must understand the problem regardless of whether you start with a solution or not».*

Problem knowledge is seen as the foundation for a business opportunity. The students all agree that the goal of a feasibility study is to discover a severe enough problem to represent a business opportunity. Identifying a problem is necessary before defining a solution as the solution was always heavily affected by the problem: *«If I could have started over again, I would have pushed harder to find a problem to work from».* When the students gained knowledge about the problem, it usually enrichened the market knowledge as well. The primary outcome of gaining problem knowledge is to test if the business opportunity is worth pursuing: *«We identified a problem, but it was difficult to find profitable ways to solve it»*. The students observed problem severity as the best, in terms of fastest and cheapest metric, to attract a willingness to pay in a market.

4.3.1.4 Solution knowledge

Solution knowledge describes the technical specification on how a solution for a specific problem works, meaning "problem-specific technical knowledge for a case". The students explained it as the answer to how a solution should be made. Solution knowledge can be understood within the boundaries of technical specifications and production processes, combining team prior experience and the users' requirements.

The students described that the lack of solution knowledge does not disable discovering of problems, thus business opportunities: *«Exactly what the solution will be is not important in a feasibility study».* There was a consensus that a narrow focus on solutions reduced the overall quality of the feasibility study: *«Looking at the solution before the problem is identified will only waste your time»*. However, the students mentioned that the solutions' feasibility has to be addressed: *«Although details of a solution are unimportant to begin with, it must be realistic that it actually can be created».*

4.3.2 Entrepreneurial knowledge building

The different classes of knowledge are rarely possessed by the team when the feasibility study begins, and they must build this knowledge in order to conduct a feasibility study. Referring to section *4.2.3 Feasibility study tools*, the following chapter describes from where and how the students built the different types of knowledge.

4.3.2.1 Building knowledge

The students agreed that in all feasibility studies, the core activity is building knowledge to identify a business opportunity. The preexisting knowledge base was mentioned as valuable and beneficial. However, the students experienced that a lack of prior knowledge does not

disable discovering opportunities: *«Lack of relevant knowledge required me to learn the industry, but it is easy to acquire new knowledge – You get much experience in a short time»*. All necessary knowledge can be built during a feasibility study by gathering information: *«We had no relevant prior knowledge, but during the week we learned extremely much and built valuable domain knowledge».*

When building knowledge, the students observed initial information gathering to improve knowledge the most: *«The information you get through the first conversations are decisive»*. The students experienced that starting with a wide scope was beneficial for the feasibility study as a whole as it enabled flexibility based on the information that was gathered: *«Although the market seemed unassailable at first, we found good opportunities by gathering market information widely before delving deep into the most promising problems that were discovered»*. This approach seems more beneficial the less preexisting domain knowledge the team possesses: *«Our group had no relevant knowledge for the case we were testing (...) by starting wide and gradually narrow down we were able to identify a set of business opportunities».*

To build knowledge, the students experienced that phone calls were the best source of information: *«Calling is the best way to uncover and acquire knowledge». However,* the quality of the information gathered through phone calls are dependent on communication skills as mentioned in section *4.1.2 Team skills*.

The students described that if the information gathering is structured, it increases both efficiency and quality of the feasibility study: *«Gathering information structurally helped us benefit from being several in our team, validating hypotheses with several different informants efficiently»,* while conversely, an unstructured information gathering reduces both efficiency and quality: «*Without a clear plan for the information gathering, things get messy and we, start to pull in different directions».*

The students experienced that interdisciplinarity among the team promoted misunderstandings because the gathered information was interpreted differently within the team; hence building shared knowledge within the team became difficult: *«It is hard to know whether I have interpreted the collected information equally as others»*. Handling the interpretation problem, students experienced honest and frequent communication to be the best solution: *«By being honest with each other, we can more precisely figure out what each of us knows, and don't know. Then knowledge will be smoother and the team can utilize that knowledge to a greater*

extent.». Or as one student pointed out: *«The group will be most efficient if everyone understands everything»*. Through mutual sharing, a shared knowledge base will be built in which the team can further expand, thereby enabling efficiency and quality of knowledge building.

4.3.2.2 Sources of knowledge

The knowledge used in the feasibility studies originated from several sources, both external and internal. The internal sources contributed mainly to solution knowledge and were based on the team members' prior education. The students referred to this as "general technical knowledge". When it was applied to a market setting, it became solution knowledge. This kind of knowledge made it easier to discover viable solutions for a problem. As one student described: *«It is easy to find a solution if you have a well-defined problem».*

The students listed several external sources of information, described in section *4.2.3.2 Network*. Further, the students mention two sources of knowledge not originating from a specific external network of informants:

1. Team members' previous work experience: *«My own work experience was a source of knowledge that helped us in the feasibility study.»*, *«Being the "problem-experiencer" is the absolute best source of information about a problem.»*
2. Public information help guide the students, especially in an early phase: *«Before selecting the idea I usually do some financial research on "proff.no" of companies within the industry we are pursuing to see if there are good margins»*, *«Through Google, I look for some initial information to have some knowledge helping me to know how to act in conversations»*.

In exploring knowledge, students experienced being exposed to several types of information that helped build knowledge. As one student noted, *«When you call someone (...) suddenly you get information contributing to build all types of knowledge».* The four types of knowledge the students gathered through their sources can be determined either as "primary information" (PI) or "secondary information" (SI). Primary information is meant to describe the type of knowledge the student wanted to gain from that particular source, while secondary information is what the student experienced the source also would share. The following table displays what information from which source helping to build what type of knowledge the student experienced during the feasibility studies.

Source type	**Industry knowledge**	**Market knowledge**	**Problem knowledge**	**Solution knowledge**
Public information		PI		
Team knowledge	SI		PI	PI
Industry expert	PI	PI	SI	PI
Industry actor	PI	PI	SI	PI
State officials	PI		SI	
Competitors			PI	SI

Table 7: Sources of knowledge

Acquaintances, friends, and family can be mentioned as sources of knowledge, but our findings suggest these informants play the most important role as a door-opener to a network of sources.

4.3.3 Knowledge gaps

Knowledge gaps are the problem of the differences in what the team thinks they know and what they really know. The well-known phrase "You don't know what you don't know" summarizes it, or as a few of the students repeatedly mentioned: *«It's difficult to know what you want to know»*.

4.3.3.1 Origin and identification of knowledge gaps

A significant point repeating itself amongst the informants is that knowledge gaps are hard to identify, and it seems even more complex to discover the impact of the knowledge gap. Some students shared experiences when a team member declared knowledge within a field. The other team members tended to overestimate this knowledge: *«I might speak confidently about sensors although I only have completed one course in it. However, the rest of the team declared me as a sensor expert»*. The knowledge gap can be perceived as sorted out while it might still be existing. The student reflected about overestimation of knowledge to be a source of knowledge gaps: *«Based on each other's academic background, we tend to overestimate each other's knowledge».*

Through open and honest team communication, knowledge gaps can be identified. We found it crucial to distinctly delimit and communicate where each team members' knowledge comes to an end – where one or several knowledge gaps might exist. By being open and honest about what you know and do not know can more easily be identified: *«As all of us shared our knowledge with each other, we were able to identify what we knew and what information we had to seek»*. In occasions where the teams' idea was closely related to one of the team

members' specialized knowledge, the ability to identify the knowledge gap was more objective: *«What we tested was too niche for my domain knowledge to be relevant».*

Referring to section *4.1.3.1 Feasibility study roles*. The students agreed that the absence of constructive discussions or a person who challenges the status quo makes it more difficult to identify knowledge gaps: *«By not having someone who challenges the team and creates some discussion, you may overlook important things instead of taking them into account»*.

The students experienced that people whom both understood the case and the team composition was beneficial in reduce knowledge gaps, specifically the VCP staff: *«Feedback from mentors made it easier to see the case from other perspectives, helping us identify what we didn't know and what we had to find out.»*. However, a problem noted is that it is hard to notice when you have one or several knowledge gaps. As the student assistants occasionally dropped by the teams' room, the team was forced into a discussion, contributing to the awareness of knowledge gaps: *«After the student assistants or "teachers" had been into our room, we ended up having a thousand things to figure out»*.

Concerning section *4.2.2.3 Biases*, informants might share a false picture of reality during a conversation – giving the student an impression of a reduced knowledge gap while it might still be existing. Students found independent experts without any commercial interest to help verify and reduce knowledge gaps: *«Independent experts, such as professors at a public university, can help verify the information and make us aware of what we don't know and important things to consider».*

4.3.3.2 Effect of knowledge gaps

Having one or several knowledge gaps within the team in a feasibility study have been found to reduce the overall result of the feasibility study. Through structured knowledge building, gaps might be reduced, but this will always be prone to the quality of the processed information. Referring to section *4.2.2.3 Biases*, confirmation biases might occur both during information gathering, refining, and sharing, resulting in a potential erroneous conclusion: *«I don't think you can ever be 100% sure that your information is right»*.

As knowledge gaps are hard to discover, the absence of honest self-reflection about personal knowledge might result in both overestimations of every team member's knowledge, also potentially resulting in erroneous conclusions: *«We tend to overestimate each other's knowledge»*. Hence, the students described how a knowledge gap could lead to a lack of structured use of hypotheses: *«At one point we did not know what we needed to find out, so we*

just sat there lurking (...) we talked to the student assistant we got aware that we had several knowledge gaps we needed to sort out», reducing progression in the feasibility study.

Ultimately, due to the time constraints in a feasibility study, failing to identify knowledge gaps might lead the team towards a dead-end using valuable time on non-productive tasks: *«We used a lot of time verifying things we already knew, over and over again (...), there were several aspects of the business idea we should have used time on instead».*

4.3.4 Summary of entrepreneurial knowledge management

In the context of a feasibility study, the students divided knowledge into four categories: knowledge about the industry, market, problem, and solution. Knowledge about the problem was deemed the most important because finding a solution is considered easy if the problem is well-defined. Knowledge about an industry helps define the market in which the problem originates from.

In order to gain this knowledge, the students build team knowledge through internal and external sources of knowledge. The knowledge from each member of the team is determined as internal. In contrast, everything outside the team is determined as external. All sources of knowledge seem to be prone to knowledge gaps, highly affecting the overall quality of the teams' knowledge base.

Knowledge gaps are hard to discover. However, discovering the knowledge gaps seems to improve the feasibility study's efficiency and quality – reducing the difficulty of "knowing what you don't know".

5 Discussion

The discussion will examine the findings from our study towards relevant theory to shed light upon the research question: *"How nascent entrepreneurs in VCPs explore business ideas before starting a new venture"*. It is divided into three main chapters.

The first chapter, "*Preselection of teams in a VCP"* will look at how it is to be a nascent entrepreneur in a feasibility study at NSE. As teams in a feasibility study at NSE are preselected by faculty to identify a business opportunity, this chapter will discuss how various types of team characteristics affect the teamwork. Ultimately, trying to answer the first research question:

RQ 1: *How do preselection of teams in a VCP affect the ability to explore business opportunities?*

The subsequent chapter *"VCP team exploration process"* will discuss how the teams explore business ideas in a feasibility study. At NSE after the teams are composited, they are given one week to work with a given business idea, where the goal is to validate it as a business opportunity. However, they often end up with a business opportunity based on a different and often improved business idea than the one they started with. Therefore, in this chapter, we aim to answer our second research question:

RQ 2: *How does the preselected team explore business ideas in a VCP?*

The last chapter is a result of the discussions in the previous chapters. Merging insights from both preselection of teams and team-based exploration processes into a point of convergence that we call *"Knowledge gaps"*. Through arguments presented here, we work towards our proposed purpose.

The discussion involves a set of models derived by our empirical and theoretical findings. As a model rarely reflect the real world perfectly, the models in the following chapters are not absolute and will function as a tool to illustrate our main findings compared to theory.

5.1 Preselection of teams in a VCP

As mentioned in section *3.1.1.2 Feasibility studies at NSE*, teams in a feasibility study at NSE are composed by faculty, which disregards organic formations of teams, resulting in a greater variety of team compositions. Since the students on NSE are mostly separated by their

education and individual interests, we claim the findings from NSE as sufficient to shed light upon how similarly structured VCPs' are affected by the preselection of teams.

The most predominant segmentation of the teams in our study divides them into either homogenous and heterogenous teams, where their ability to work and communicate affects the functioning level. In order to illustrate our most repetitive findings, we propose a model that can help describe how a team can influence its functioning level.

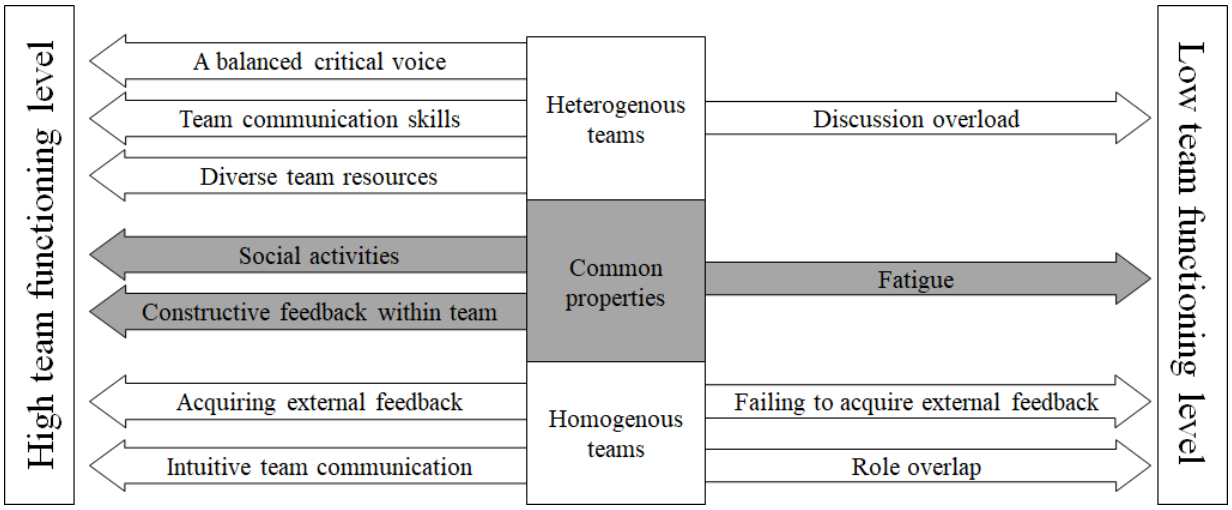


Figure 4: Team function level

The center of the model contains three stacked boxes that represent the entity of findings in our study related to teams. The arrows spurring out of the three centric boxes present our findings of what actions and events increase or decrease the team functioning level. The centric boxes define the following subchapters of this team discussion.

5.1.1 Commonalities

The most significant common properties affecting both heterogenous and homogenous teams were “Social activities”, “Constructive feedback within team”, and “Fatigue”.

As limited by our research methodology, we could not establish whether social activities are more critical for a homogenous or heterogeneous team. Nonetheless, we acknowledge from Brattström (2019) that the “in-group bias” effect tends to bolster trust and collaboration in homogenous teams – perhaps resulting in reduced demand for social activities in these teams as a homogenous team tend to have similar interests (Brattström, 2019). We acknowledge heterogenous teams’ ability to gather a wide range of information, while there is a risk of experiencing information overload (Foo, Sin and Yiong 2006; Zhoe and Rosini, 2015). Our findings suggest having a social bond with your teammates as an efficient way to a fluent

workflow, supporting earlier research by Foo, Sin and Yiong (2006) regarding social integration as a contributor to well-functioning teamwork.

We did not find a direct link with constructive feedback as an effect of social activities. However, we found constructive feedback regularly to occur when the team atmosphere was good. Although we cannot precisely determine how a good team atmosphere originated from our data, we can, by applying literature help create reasoning. According to Chen, Chang and Chang (2017) a shared cognition among the team members help to promote a harmonious atmosphere by maintaining team cohesion, and the teams' cohesion is reflected by the teams' social integration. Acknowledging Chen, Chang and Chang (2017) we suggest cohesion in this context as essential to promoting open and honest communication – facilitating constructive feedback (Foo, Sin and Yiong, 2006). This emphasizes that engaging in social activities prior to the feasibility study is a beneficial catalyst to shared cognition, resulting in greater team cohesion (Chen, Chang & Chang, 2017). Therefore, we suggest that both heterogeneous and homogeneous teams should initiate social activities prior to the feasibility study to increase their function level.

Properties common for both homogenous and heterogenous teams decreasing the teams functioning level were identified as "team conflict". From our findings, the term has several distinct components, whereas most of the observed team conflicts can be traced to either fatigued team members, bad team atmosphere, or a combination of them. In this context, we consider that the majority of all disagreements originate from a task conflict (Klotz *et al,* 2014) as decision-making is an essential part of a feasibility study. Task conflicts help conduct premium decision-making (Chen, Chang and Chang, 2017), and as feasibility studies at NSE are done in teams, so are the decisions. We therefore propose that in a VCP, team decision quality depends on ability to achieve sufficient task conflict without establish a team conflict.

Lack of shared cognition within the team will create many misunderstandings and misinterpretations, which will trigger more relationship conflicts (Chen, Chang and Chang, 2017). Referring to section *3.1.1.2 Feasibility studies at NSE*, feasibility studies at NSE have an intense schedule with less time for leisure and recovery, resulting in more stress than a normal week of studying. According to Omrane, Kammoun and Seaman (2018), exposure to stress without sufficient recovery time can result in fatigue over an extended time. In the worst case, this results in a breakdown and burnout. Our findings do not specifically address students' burnout during the feasibility studies but feeling fatigued during and after a feasibility study is

considered normal. However, our findings suggest that fatigued students trigger frustration, promoting unproductive discussions that decrease overall team functioning. As supported by Brattström (2019), the teams' emotions, such as frustration, can dictate the behaviors in the team. In this study, task conflicts have been infused by the nature of the context of a feasibility study, triggering conflicts to become relational (Guenter *et al.,* 2016). We found that it was mainly the students who created the work culture, not the faculty. Therefore, we understand fatigue to unfold in the same manner for nascent entrepreneurs at a VCP.

On the other hand, our findings suggest that we find "bad team atmosphere". This is best understood as a collective term for negative team emotions and failure to handle and adjust team cohesion. However, the origin of bad team atmosphere is rather ambiguous. As emotion fuels behavior (Brattström, 2019), we have reason to believe that negative emotions such as frustration, anger, and discord (Brattström 2019), influenced by fatigue (Omrane, Kammoun and Seaman, 2018), have caused a bad team atmosphere. Although there is an obvious link between emotions and behavior, we suggest that they are somewhat interrelated in this setting where emotions might originate from behavior. Nevertheless, creating and keeping a good team atmosphere is beneficial. Therefore, we suggest that nascent entrepreneurs VCP students should adjust workload in such a manner that they avoid fatigue simply because workloads that cause fatigue are likely to bring more trouble than gain.

One commonality not visualized in Figure 4: Team function level, is the presence and emergence of leaders within the feasibility study teams. As we could not trace this finding to either homogenous or heterogeneous teams, and whether it contributed positively or not to the team functioning, it does not fit within the figure above. Our findings support Sirén *et al.* (2020) in identifying leadership emergence in a nascent entrepreneurial team. Our findings suggest that some leaders were explicitly or indirectly chosen due to their knowledge of the business idea or personality traits. Further, we discovered that by building knowledge, individual team members took more responsibility like a team leader, corresponding with Sirén *et al*. (2020).

5.1.2 Heterogenous teams

In heterogeneous teams, there are especially three properties that seem to have the most effect on the teams functioning level, labeled as "diverse team resources", "critical voice in balance", and "discussion overload".

Heterogenous teams consist of individuals with diverse study backgrounds, life experiences, and networks, which gives a wide range of resources that benefit in an exploration phase as the

team members see the world differently, uncovering multiple perspectives in a volatile context (Diakanastasi, Karagiannaki and Pramatari, 2018). Thereby, heterogeneous teams provide access to diverse and complementary resources, acting as a catalysator for creativity that can improve the team's problem-solving ability (Foo, Sin and Yiong, 2006; Henneke and Lüthje, 2007; Brattström, 2019). A heterogeneous team will also represent a wider part of the population, letting them more easily understand other people and their perspectives (Brattström, 2019). This can improve networking and accessing crucial information about industries, markets, problems, and solutions (Zhou and Rosini, 2015).

Individuals with different work preferences, which we often find in heterogeneous teams, have complementary points of view that widen their perspectives (Brattström, 2019). As the team members are diverse, so are their opinions. When the team failed to manage and balance the amount of critical feedback and different opinions originating from the teams' diversity, it caused what we have called a "discussion overload". When discussions get out of hand, the overload of critical thinking preventing the teams from assessing the information objectively. Our findings suggest that balancing the critical voices of heterogeneous teams is a decisive factor in achieving a high functioning level. If a team is unable to achieve this balance, their discussions tend to become unproductive and trigger a discussion overload. Emphasizing shared cognition, a discussion overload can trigger friction within the team which can turn into relationship conflicts, further weakening the team cohesion (Chen, Chang and Chang, 2017). Due to misunderstandings and misinterpretations, we find discussion overload in heterogeneous teams to get off-topic, making the team underestimate the business ideas' potential, ending with a tunnel vision only seeing problems with the case.

Although lack of shared cognition is problematic, literature suggests that this can be counteracted by having a leader who facilitates building consensus within the team (Chen, Chang and Chang, 2017). As feasibility study teams rarely have a formal leader, we suggest social team activities before a feasibility study helps create social bonds, facilitating enhanced team communication and satisfaction (Diakanastasi, Karagiannaki and Pramatari, 2018). We also suggest that especially heterogeneous teams benefit from having team members with well-developed communication skills, helping to ease misunderstandings and lessen the non-productive discussion. We also found temporary "chaos management" roles to emerge from teams when the team failed to create consensus. We observed this leading figure to emerge reasonably often in this context. However, we have not encountered any literature discussing

the emergence of a temporary “chaos management role”. Therefore, we believe that this field in nascent entrepreneurial teams needs more research.

5.1.3 Homogenous teams

For homogenous teams, we found especially four properties affecting the team functioning level that is: “Role overlap”, “Intuitive team communication”, “Acquiring external feedback”, and “Failure of acquiring external feedback”.

Homogeneous teams usually lack diversity, thus have a high knowledge overlap which results in higher shared cognition. Our findings support literature that homogenous teams intuitively communicate well (Brattström, 2019). Much of this effect can be traced back to shared cognition (Chen, Chang and Chang, 2017). In contrast to heterogeneous teams, we found misunderstandings to be less prevalent within homogenous teams. However, the lack of diversity also limits their ability to see multiple perspectives (Zhou & Rosini, 2015; Brattström, 2019). As a result of similarities within a homogenous team, we found that they are especially prone to a lack of constructive discussions challenging the status quo.

Hence, our findings firmly suggest that a “critical voice role” is crucial in homogenous teams. In the absence of a team member who can take this role, we find mentors a valuable substitute to help ease these conflicts, aligning with Brattström (2019). Although heterogeneous teams benefit from sparring with mentors, we found it not only beneficial but highly necessary for homogenous teams to engage mentors for mainly two reasons (Brattström, 2019): (1) Through mentors, the team can obtain crucial information and input that help widen their available resources such as specific types of knowledge, and (2) Constructive feedback from mentors can make homogenous teams aware of other perspectives. In combination, these two helps initiate discussions that are necessary for progression in the feasibility study. When homogenous teams fail to take advantage of external resources, they become restrained by their own opinions and employ a narrow scope that reduces their feasibility results' validity.

Emphasizing work preferences, we found homogenous teams more prone to disagreements as team members fancy the same types of tasks or team roles. We found role-defining in homogenous teams as a source of relationship conflicts – declining the team functioning level.

5.1.4 Summary of team functioning level in a feasibility study

Teams in a feasibility study at NSE are composed by faculty, resulting in various team compositions. The effect of these compositions can be transferred to other VCP’s with nascent entrepreneurs of diverse backgrounds and preselected teams. We divide the teams into

homogenous and heterogenous teams, which can be either high or low functioning. The team function level affects the ability to explore business ideas as the team function level explains the teams' ability to cooperate and communicate.

Discussions are a natural part of a feasibility study and beneficial as they contribute to making premium decisions. Task conflicts are beneficial as enablers of discussions, but they can also turn into harmful relationship conflicts. Social activities during the feasibility study strengthen team cohesion which helps build a shared cognition and reduce the effect of fatigue. Homogenous teams start with a high shared cognition baseline, whereas heterogeneous teams start with a lower shared cognition baseline. As we find that the level of shared cognition is crucial for whether discussion becomes productive or harmful, heterogonous teams should especially invest in building a shared team cognition to avoid conflicts escalating. In addition, a heterogeneous team needs to enable a source of leadership that also helps mitigate conflicts. In contrast, homogeneous teams need to access a source of a critical voice to initiate productive discussions instead of engrossing in details.

This summary shows how preselection of team can create both homogenous and heterogenous teams along with the positive and negative effects of the composition. We also discovered which steps teams can take to mitigate the negative effects of team preselection to increase their team functioning level. This helps to answer RQ1, by explaining how the preselection of teams in a VCP affects the nascent entrepreneurs' ability to explore business opportunities.

5.2 VCP team exploration process

At NSE, the feasibility study starts with a business idea, and the goal is to validate the idea as a business opportunity. As these frames are common for VCP's at least in Scandinavia (Rasmussen and Sørheim, 2006) we find our findings adequate for discussing the team exploration process in VCPs. This chapter interprets the validation process as team-based exploration through knowledge management with a subprocess of hypothesis-based entrepreneurship.

5.2.1 Knowledge management

As presented in our findings, the students divided the knowledge they managed during the feasibility study into four different classifications: "Industry knowledge", "Market knowledge", "Problem knowledge" and "Solution knowledge". Based on these findings, we have identified a pattern, which is visually presented in what we call the "knowledge funnel".

Figure 5: The knowledge funnel shown below represents our understanding of the knowledge classifications, along with a simple example elaborating each class.

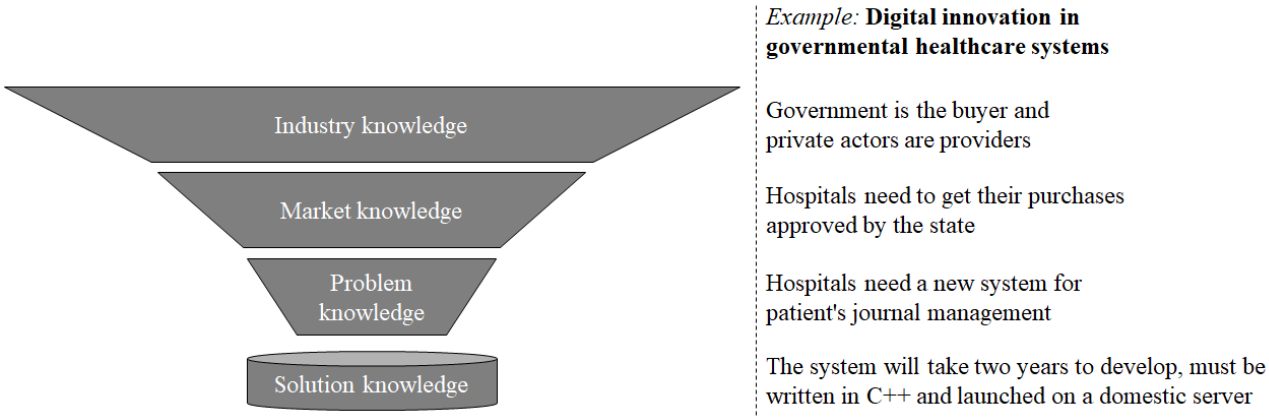


Figure 5: The knowledge funnel

Each of the terms Industry knowledge, Market knowledge, Problem knowledge, and Solution knowledge from our findings have their own properties. These knowledge classifications can partially be recognized by Shane (2000) and Widding (2007).

Industry knowledge is the case-independent knowledge of how and why an industry works. This definition is somewhat vague, but so are the boundaries of the term. Our findings suggest the term assesses the general, relatively shallow understanding of an industry. This knowledge is essential for defining a market, meaning that a general understanding of an industry must be held before a market can be recognized (Shane, 2000).

We found it favorable that one person in the team had industry knowledge from his or her background. Nonetheless, the choice of the market is a joint decision based on Industry knowledge. Therefore, Industry knowledge must be shared so that all the team members have a sufficient understanding to agree in selecting a market. This implies that the knowledge is not only shallow but also relatively easy to share within the team.

Due to the time constraints of a feasibility study, the students agreed that there is a good heuristic to stay in the same industry, even after initial markets or problems turn out to be invalidated. As it is likely to identify other markets and problems in the same industry through Industry knowledge. We would therefore recommend nascent entrepreneurs to continue investigating within the same industry rather than abandon it.

As we see Widding (2007) covers industry, market, and problem knowledge with the term "market knowledge". We argue that this is insufficient in the context of exploring business

ideas. Based on our findings, we see it reasonable to separate the knowledge types instead of lumping them together. As exemplified above, dividing between Industry knowledge and Market knowledge makes it easier to recognize when sufficient depth of Industry knowledge is achieved to proceed down the knowledge funnel. Thereby, ensuring the efficiency required due to time constraints while still building necessary industry knowledge for exploration.

The next step in the funnel is through our findings identified as market knowledge comprising knowledge about market actors such as customers, users, suppliers, and competitors. This makes it possible to validate a business opportunity in terms of economic potential and customer behavior. This is similar to what Shane (2000) defines as "Knowledge of ways to serve a market". Further down the funnel, we have to find Problem knowledge, which through our findings is defined as all knowledge that can answer the question "why would you pay?". This will reflect in the core knowledge a team needs to pursue the opportunity. Our definition of Problem knowledge aligns with Shane's "knowledge of customer problems" (Shane, 2000).

Unlike Shane (2000), we recognize a strong link between Problem- and Market knowledge. For example, gaining knowledge from a potential customer in a market helped define the problem. Simultaneously building problem knowledge helped redefine and deepen the knowledge of the markets. For example, we define willingness to pay as a part of Market knowledge, yet it is achieved through understanding the severity of the problem. Therefore, we argue that a market should not be abandoned without studying a couple of problems originating from it. Nevertheless, we find separating Market knowledge and Problem knowledge to ease discarding a problem and return to Market knowledge to find new problems without having to "start over" in a new industry.

After identifying a problem, the students employed Solution knowledge to validate the feasibility of creating a solution to the identified problem. Hence, Solution knowledge is necessary to validate or invalidate a business opportunity. Shane (2000) does not define this type of knowledge explicitly but has several implications for it. Widding (2007) describes it through product/solution knowledge. Some teams have sufficient Solution knowledge originating from a team member with a relevant background. However, as Solution knowledge takes years to build, we suggest that team without it should obtain it through knowledge reservoirs (Widding, 2007).

Nonetheless, we also found that the students experienced that having knowledge of how a solution could be made, hence Solution knowledge, contributed to gain Problem- and Market

knowledge through networking, regardless of the informant's technical insight. This finding aligns with Shane's (2000) proposition; hence we find it generalizable to nascent entrepreneurs at a VCP.

5.2.1.1 The knowledge management process

Our findings highlight that the way through the knowledge funnel is rather dynamic and that most feasibility studies follow similar patterns.

In the context of the VCP, a feasibility study starts with a selection of business ideas where the goal is to validate or invalidate the idea as a business opportunity. This builds a frame around the feasibility study. Combined with the discussion from knowledge management, we have summarized the feasibility study process, visualized in model Figure 6: Feasibility study process. The arrows represent the relation between the different structures. Our findings highlight that the way through the knowledge funnel is rather dynamic and that most feasibility studies follow similar patterns.

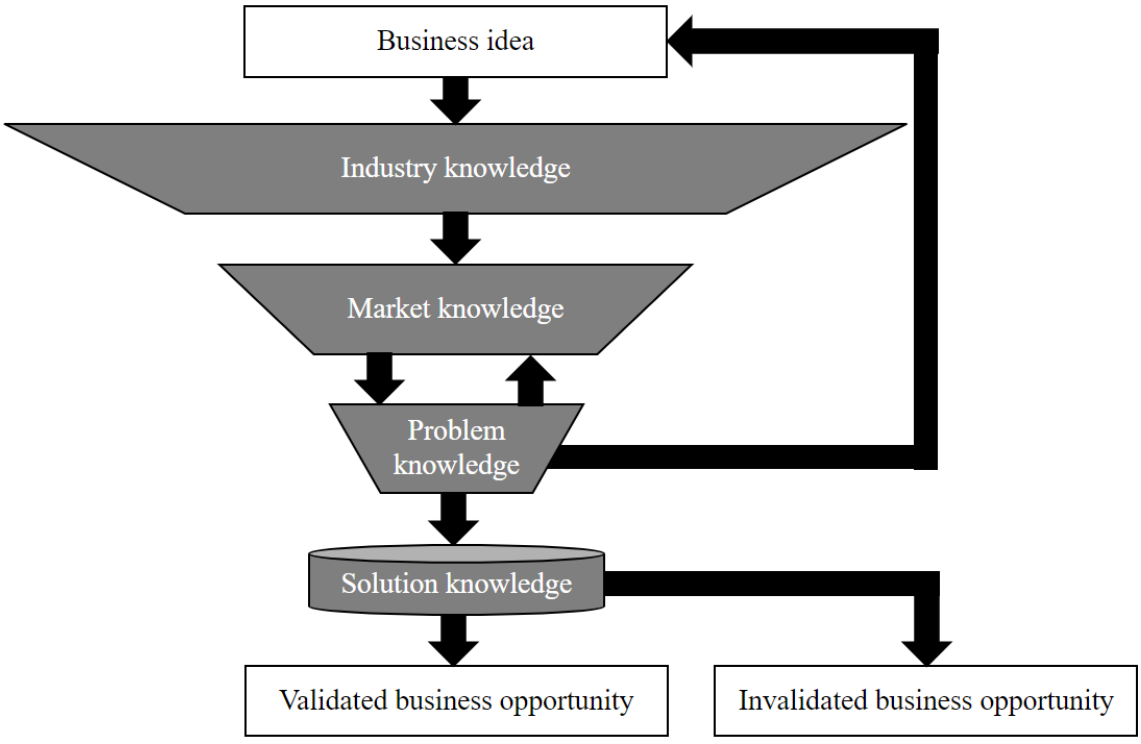


Figure 6: Feasibility study process

From the findings, we see the overarching process in the NSE feasibility study is to take a defined business idea and assess its potential. Therefore, the frames of NSE initializes the feasibility study as a causational thinking method (Sarasvathy, 2001). The feasibility teams'

first journey through the "knowledge funnel" is therefore based on causational thinking. However, as our findings suggest, many factors cannot be predicted. For example, when Problem knowledge invalidates a market, the team has expanded their Industry knowledge — providing new perspectives that enable discovering new market opportunities within the industry. For each turn through the knowledge funnel, the team's ability to recognize a business opportunity increases as they accumulate knowledge. We interpret the accumulation of knowledge to imply that the team has gained access to new means (Sarasvathy, 2001). Shane (2000) claims that prior knowledge is necessary to recognize a business opportunity. However, lack of prior knowledge does not seem to stop students at NSE from recognizing business opportunities. We explain this phenomenon through the fact that NSE students build knowledge throughout a feasibility study. The students obtain the knowledge necessary to recognize business opportunities that they could not have recognized at the start of the feasibility study. Shane's (2000) proposition seems partly correct but not absolute in the light of our findings. Therefore, if a VCP has a similar feasibility study context as NSE referring to section *3.1.1.2 Feasibility studies at NSE*, we propose a lack of prior knowledge does not stop nascent entrepreneurs at a VCP in exploring business ideas. The nascent entrepreneurs can build the necessary knowledge to recognize business opportunities through a feasibility study.

Compared to Sarasvathy (2001), we find mainly two differences to our findings. First, we find differences from Sarasvathy's model in our proposed approach to the effectuation mindset in a feasibility study. Second, compared to Sarasvathy's (2001) approach and definition of gathering through interaction, we propose using more structured interactions with the knowledge funnel as a guideline. A structured approach is particularly useful as the students work in teams instead of individually. Working in a team makes it harder to build an opportunity purely based on their knowledge, especially as a feasibility study has a short time frame. The time constraint makes it harder to comprehend each team members' knowledge and network fully. Because teams at the start of a feasibility study usually do not possess the necessary network or prior knowledge, they benefit from a structured approach to selecting a business idea.

Lastly, we see that contrary to Sarasvathy's (2001) model, it is in a successful feasibility study possible to conclude that the business opportunity is invalidated. This is connected to selecting a business idea, where the invalidation can represent a successful outcome – that is, clarifying that a business opportunity is not worth pursuing. From our findings, we see that invalidation

is determined by whether a solution can be made by means of “is it possible” and “is it profitable”.

5.2.1.2 Summary of knowledge management

We redefine knowledge classes from Widding (2007) and Shane (2000) into what we experience as essential in the context of feasibility studies at NSE, where the purpose is to explore business opportunities. As such, we define Industry knowledge as the shallow, easily shared knowledge of how and why an industry works, which is necessary for defining a market, thus usually contains several possible markets. Market knowledge is the knowledge necessary for discovering problems, while Problem knowledge is the knowledge of what the business opportunity consists of. Finally, solution knowledge is the final validator of the business opportunity. It is positive if the team possesses solution knowledge but not decisive for the feasibility study as it can be accessed through a knowledge reservoir.

The feasibility study process students at NSE goes through reminds of the effectuation cycle from Sarasvathy (2001). However, it differs due to the team-based approach and the selection of business ideas as their starting point, which is the same as other VCP’s (Rasmussen and Sørheim, 2006). The team-based approach forced them to use the knowledge funnel as an overarching structure, making it possible to end up with an invalidated business idea as the outcome of the process. If a market is invalidated, the team redefines their initial business idea based on the new insight from the last journey through the knowledge funnel.

Based on our findings, the proposed model Figure 6: Feasibility study process, displays how knowledge management functions in a feasibility study at a VCP. The model synthesizes what students experienced as beneficial or problematic in feasibility studies. We believe that the model can create reasoning for how a feasibility study can be conducted. This might help other VCPs to understand how knowledge can be managed in order to discover business opportunities.

5.2.2 Hypothesis-driven entrepreneurship

Dimov (2020) mentions the nested subprocess as a phenomenon that helps describe the content of entrepreneurial processes - such as actions and action patterns. Our study uncovered a nested subprocess the students used to progress through the feasibility study process. The subprocess we will examine through this chapter will help explain what happens inside the black arrows in the “feasibility process model” presented above.

We believe that entrepreneurs in VCPs explore through a series of actions that are structured into a subprocess. The subprocess focuses on building knowledge through networking to build a solid knowledge base for decision making. We have identified three steps of the subprocess:

1. Forming hypotheses.
2. Learning through networks.
3. Decision making that either end in:
    a. Move along, down the knowledge funnel to the next step.
    b. Taking a step back to form new hypotheses.

From our findings on NSEs feasibility studies, we can see that a structured process is achieved through a sequential workflow. The students form hypotheses they try to answer using networks. As this is process emerges without the faculty involvement, we claim this process to be autonomous and descriptive for other VCP's that lets the students learn by trial and error (Politis, 2005). The accumulated knowledge from networking is condensed and discussed in a team meeting. If the information is insufficient, they will form new hypotheses that they try to answer through networking. Then they will again meet to decide if they have sufficient knowledge to move on or not. This cycle will continue until they are satisfied with the level of information or the feasibility study's time constraints force them to move on with insufficient information.

The sequential iterative subprocess can be seen as a tool that the students use to build the needed knowledge through hypothesis and networking. As this loop is the engine of how exploration in a feasibility study functions, we have given it a proper but perhaps lengthy name; "Feasibility subprocess loop". The model below gives a visual understanding of the subprocess.

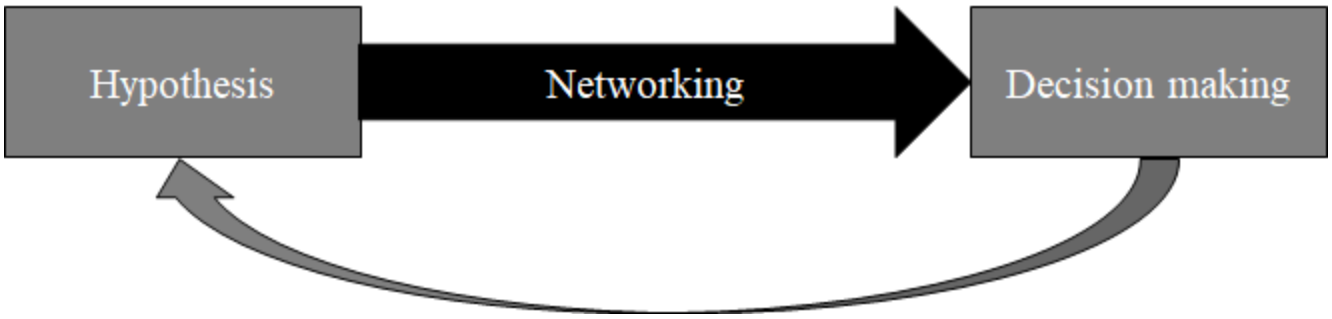


Figure 7: Feasibility subprocess loop

5.2.2.1 Hypothesis - facilitating and structuring the experiential learning process

From the findings, we understand hypotheses as a tool for creating a shared understanding of what to figure out. Their purpose is to spark discussions during a meeting while simultaneously guiding the students in their networking. These findings are supported by the theory of hypothesis-driven entrepreneurship (Leatherbee & Katila, 2020).

Our findings suggest that it is impossible to be certain what kind of information an informant would provide during information gathering. For this reason, hypotheses are employed to achieve a structure of the current state of knowledge and the necessary state of knowledge to make progress in the feasibility study. We also understand that the hypothesis used in a feasibility study should be shaped as accurately as possible while including all team members' opinions. The process of shaping the hypothesis is where the great benefit of implementing them originates. Thus, the process forces the team to agree on what knowledge they possess and what they ought to find out. Hypotheses created by a single individual or rooting from an external source are quickly forgotten and overlooked, whereas a hypothesis with common ownership is far more structuring (Klepper and Bruegge, 2018; Leatherbee & Katila, 2020).

From the theory of hypothesis-driven entrepreneurship, we also see that few hypotheses are better, as it seems simpler to investigate a few crisp hypotheses than several diffuse (Leatherbee & Katila, 2020). These remarks fit well with our understanding of the use of hypotheses in a VCP feasibility study. However, we also see that few hypotheses are better as it means that the team has come to an agreement on what they need to find out. Our findings suggest that many hypotheses imply that the team is divided and unable to agree upon which hypothesis is the most important.

Hypothesis-based entrepreneurship uses the “Business model canvas” or similar to formulate hypotheses, while our findings show that the students use the knowledge funnel for defining hypotheses.

5.2.2.2 Networking - experiential learning through social networks.

In our findings, network and networking activities are described as essential in the exploration of business opportunities. The students regularly talked about social networks and tapped into these networks to obtain knowledge (Greve and Salaff, 2005). Regularly the students would say they conducted interviews with a network of informants in order to gather information. They also mention that they reuse previously built networks in later feasibility studies. The

students' networks primarily consisted of weak ties, which are best suited for exploring a business idea (Soetano, 2017).

Our findings suggest the students engage in learning-by-doing through experiments which reflects upon improving their information gathering skill. We interpret this skill as the ability to build networks efficiently. Further, the students utilize the networks they build to obtain knowledge that help them shed light upon the hypotheses (Soetano, 2017; Leatherbee and Katila, 2020). When engaging in networking, students learn both about themselves and about the business ideas they are testing (Soetano, 2017; Leatherbee and Katila, 2020). In addition to this, a network is also the best source for new network (Greve & Salaff, 2005). Rasmussen and Sørheim (2006) described that learning-by-doing is one of the cores at a VCP. Furthermore, they do not propose any differences between the VCP's. Hence, we expect our findings on learning-by-doing to represent nascent entrepreneurs learning-by-doing in a VCP.

The problem with using external informants as sources of knowledge is the emergence and adoption of biases. The adoption of biases predominantly occurs when talking to informants with a particular interest in markets or problems. Individual students would then pass on their biases to the rest of the team like an infection (Soetano, 2017). The best way to mitigate biases is through team discussion, where unbiased team members can identify the bias and stop the spread (Leatherbee & Katila, 2020). As discussed in section *5.1 Preselection of teams in a VCP*, the properties necessary to discover biases are usually only present in high functioning teams. This puts low-functioning teams at risk when networking–making them prone to misconceptions and poor judgments. Nevertheless, it was observed that mentors could help both low- and high-functioning teams discover biases, as the mentor could fulfill the role of a critical voice discussed in section *5.1 Preselection of teams in a VCP*.

Our findings highlight that the students' networking seems to diverge from the dependencies of entrepreneurial phases (Greve and Salaff, 2005). As a feasibility study most naturally represents the first phases of establishing a new venture, it is interesting that the students seem to follow other networking patterns than one would expect based on literature (Greve and Salaff, 2005). The most apparent difference is that they go beyond contacting families and friends, which one would expect in the first phase of establishment. Instead, their networking patterns are aligned with what Greve and Salaff (2005) describe as the second phase of establishment, where it is common to contact a broad specter of people to access required resources. During a feasibility study, the students can even show signs of networking expected

in the third and final phase of establishment. In this phase, networking concentrates on key persons or organizations that can provide resources and commitment, such as landing a letter of intent with a customer (Greve and Salaff, 2005). We, therefore, understand that the students' network from the feasibility study is not only relevant for validating the business idea but also for establishing a new venture.

In contrast to entrepreneurs in general, we observe the students from this study fully commit themselves to the feasibility study. We believe that the context of a feasibility study, with time constraints and expectations regarding results set by VCP staff, forces the students to go outside their comfort zone and diverge from expected patterns of networking. By going through all three phases of establishing a new venture in only one week, the students achieve a steep learning curve due to the entrepreneurial experience in a diverse entrepreneurial context (Politis, 2005; Rasmussen & Sørheim, 2006). Nonetheless, their speed through the establishing phases and their corresponding approaches to networking might affect the quality of the social networks they build.

The students' actions and behavior draw similarities to the phenomena of network building explained in social network theory (Jenssen, 2001; Greve and Salaff, 2005; Soetanto, 2017). However, we recognize that the students seldomly framed their activities as network building. Thus, they seem unaware that they are building high-value networks for their future entrepreneurial careers (Jenssen, 2001). Furthermore, the students do not seem aware that the network gained through a feasibility study can turn into a network of weak ties through structure and intention. As proposed earlier, we find the context and process of the feasibility study at NSE generalizable to VCPs. Thus, we assume that nascent entrepreneurs performing a feasibility study at a VCP are networking similar to NSE students.

We believe that the networking behavior can make nascent entrepreneurs in a VCP prone to contact an abundance of different actors without the intention of reconnecting with them. This might influence the students' approach when contacting informants–inhibiting the value of contacts in a later entrepreneurial phase. We raise concern whether this can affect the nascent entrepreneurs' chances of developing weak ties into strong ties (Greve and Salaff, 2005). Are they aware of these mechanics, and do they understand the possibilities and values represented by the weak tie dominant networks they build through the feasibility studies? Regarding learning-by-doing, we argue that it does not matter if the nascent entrepreneurs are aware or not, as long they somehow experience the benefits and integrate it as a part of their

entrepreneurial toolset. At NSE, mentors play an essential role in nudging and facilitating students to transform weak ties into strong ties. We expect this to be the case for nascent entrepreneurs in a VCP as well.

We realize the importance of structuring and saving the contact information of informants in a fashion that they can easily reconnect with the network and develop a relationship into a strong tie (Greve and Salaff, 2005). At NSE, we find this ensured through the feasibility report and contact log that students are required to write to summarize and document their feasibility study. We have no indications for how other VCP's handle this. We can only assume that NSE's method seems sufficient.

5.2.2.3 Decision making - repeating the loop or moving forward

The final step of the subprocess is when the team evaluates the hypothesis based on the knowledge they have built through networks; Deciding which action to take next. If the teams' knowledge is not sufficient to progress, the team will form new hypotheses and continue to build a network within the same knowledge class.

We notice that the teams rarely found the optimal decisions at an early stage when uncertainty is high. Therefore, students frequently revised hypotheses before deciding whether to proceed further down the knowledge funnel (Leatherbee and Katila 2020). Nonetheless, the decisions phase will engage the team in discussions. Discussions can be productive or not, and as discussed earlier, this usually depends on the team's functioning level. As discussed in section *5.1.2 Heterogenous teams*; Another aspect of teams in decision making is that heterogeneity in teams will help teams converge on the new knowledge they have built. (Brattström, 2019; Leatherbee and Katila 2020).

From our findings, we see that the decision to move down the knowledge funnel predominantly occurs for two different reasons: (1) The teams accumulated knowledge turns uncertainty into risk, making it possible to take a calculated decision, and (2) Due to time constraints or hypothesis that is found to be unknowable, the team is forced to decide despite uncertainty. We find the first reason for deciding to be universal, as it describes how humans make decisions. The second reason for time constraint would apply for every VCP who structures their program in terms of deadlines.

The first reason for moving on in the knowledge funnel has a close link to causational decision-making. The team has managed to acquire knowledge that makes them able to analyze and estimate the risks of the business idea (Sarasvathy, 2001). This basis of a decision made the

students feel confident that their decision is right. However, we observed that causational decisions are hard to revise later, even though new evidence and knowledge points the team in a new direction.

However, when the team is forced to decide with a higher degree of uncertainty, they tend to use mentors more – relying on their knowledge and competencies. We understand this as a sign of a decision-making process based on effectuation principles (Sarasvathy, 2001). Although the students, in retrospect, reflect that decision made this way has a greater probability of leading to a dead end. Therefore, we see that the students preferer causational decision-making. Nevertheless, when necessary, they will complement decision-making with principles from effectuation. This is in many ways similar to Dew, Read and Sarasvathy (2009), who conclude that novice entrepreneurs, such as the students we have investigated in this study, prefer causational frames of logic. However, our findings suggest that NSE students use both causal and effectual logic when making decisions. However, we cannot say whether they prefer one over the other. We can only speculate that nascent entrepreneurs in a VCP use more effectual logic than other novice entrepreneurs. Further research of this aspect could shed light on how VCPs might be helping students to think like expert entrepreneurs.

5.2.2.4 Summary hypothesis-driven entrepreneurship

With inspiration from Dimov (2020), we explain the progression through a feasibility study at a VCP as a subprocess of the feasibility study model. The subprocess is based on knowledge spillover from a network through hypothesis-driven entrepreneurship (Leatherbee and Katila, 2020; Lattacher, Gregori and Holzmann, 2021). The feasibility subprocess loop consists of three steps: (1) Forming hypotheses. (2) Learning through networks. (3) Making a decision to either move along to the next step of the feasibility study process or start over at the same step with new hypotheses. An example of how the feasibility subprocess loop explains progress through the knowledge funnel is shown in Figure 8: Feasibility subprocess example.

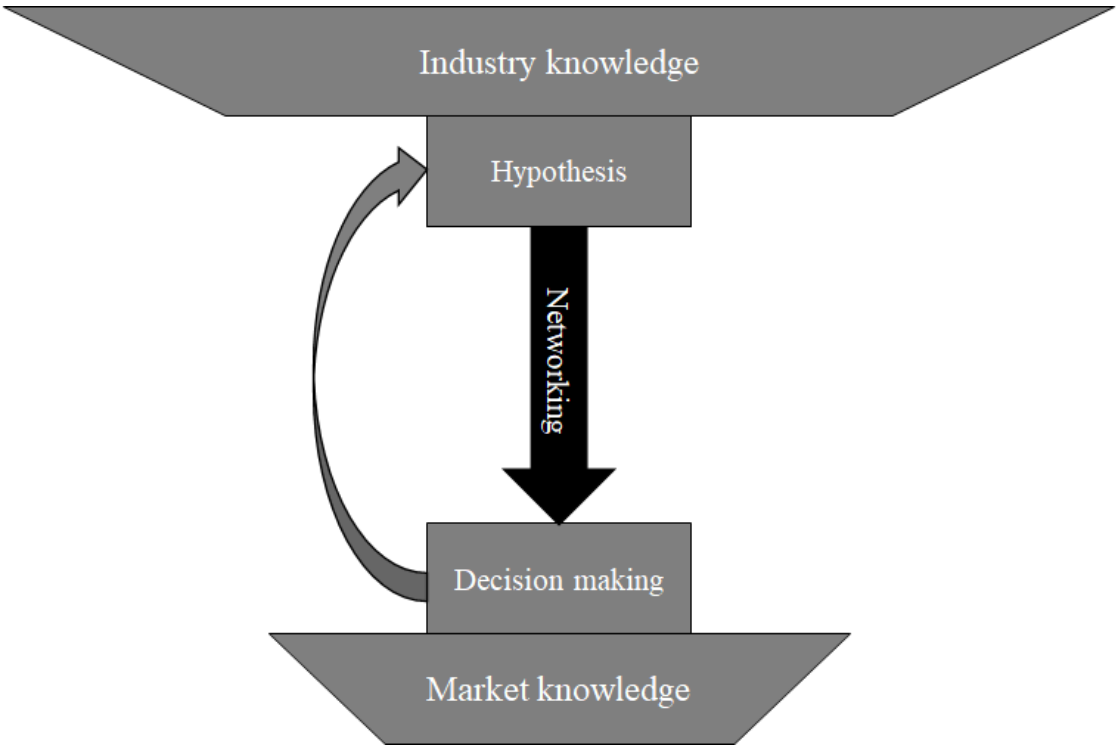


Figure 8: Feasibility subprocess example

We find hypotheses as an essential tool to create a path for making team decisions in a feasibility study. Hypotheses create a structured foundation for building knowledge, helping to make decisions to further progress in the feasibility study (Klepper and Bruegge, 2018; Leatherbee and Katila, 2020).

The hypotheses are used to guide the building of knowledge. The nascent entrepreneurs test their hypotheses by engaging in extensive networking activities resulting in greater knowledge and a network of weak ties (Seatanto, 2017). We see that the team function level affects the ability to gain quality knowledge from the network. When the nascent entrepreneurs perform networking activities, they are exposed to biases which only high-function teams can handle. From section *5.1 Preselection of teams in a VCP*, we recognize that at a VCP is dependent on management in heterogeneous teams and critical-voice in homogeneous teams. We have also found that nascent entrepreneurs at a VCP build a network with the effect of all three phases described by Greven and Salaff (2005). Hence, the network built during a feasibility study is also relevant for establishing the new venture and later in their entrepreneurial careers. These weak ties can be made into strong ties (Greve and Salaff, 2005). At NSE, we find the networking structured through a feasibility report and contact log, which we can only propose as one method for VCP's.

The nature of a VCP feasibility study forces nascent entrepreneurs to take decisions based on limited knowledge. We see the nascent entrepreneurs employ principles of both effectuation and causation in a decision-making process. Highlighting Dew, Read and Sarasvathy (2009), we argue that nascent entrepreneurs at a VCP seemingly employ a more effectual logic than novice entrepreneurs.

5.3 Knowledge gaps

Socrates once said, "The only thing I know is that I know nothing" which is a great insight into ones' own knowledge limitations. From our findings, we see Socrates' statement as highly applicable to a feasibility study at NSE. However, there are two challenges connected to Socrates's statement, best explained by quotes from the students: *«It's difficult to know what you want to know»* and *«We tend to overestimate each other's knowledge»*.

In the context of entrepreneurship theories, we must agree with Widding (2003) that the field of knowledge gaps seems to have gone under the radar of most entrepreneurship researchers. We find that the subject is mostly mentioned indirectly and that the term is used ambiguously. Perhaps the confined theoretical basis on this subject is due to the difficulties related to investigations of the unknowable (Sarasvathy, 2001). Nevertheless, Widding (2003) reassures that the phenomenon is not a creation of our own minds but is true observations from our findings. Thus we can present them, but the lack of theoretical background makes it impossible to claim relevance for VCP's. We do, however, experience all of our findings on knowledge gaps as quite generalizable for all nascent entrepreneurs, not only those enrolled at a VCP.

Our findings suggest two kinds of knowledge gaps, individual and team-based, which both affect the individual and intra-team decision-making process during a feasibility study. Individual knowledge gaps reflect the first statement, where individuals in a team overestimate their own knowledge of a subject. This has similar effects as individual biases. However, as biases will become visible during a discussion, knowledge gaps are not brought up for discussion; therefore, they cannot be detected (Leatherbee and Katila, 2020). Thus, our findings suggest that students who critically assess their own knowledge are more likely to identify their knowledge gaps.

From our findings we believe there are similarities between "critical-voice"-roles in a team and the prevalence of individual knowledge gaps. In the absence of a critical voice in the team, the team would embrace information origin from an individual knowledge gap, transforming it into a team knowledge gap.

Referring to section *5.1.2 Heterogenous teams*, we interpret heterogeneous teams as more prone to individual knowledge gaps as individuals hold knowledge within different subjects. Hence, a highly heterogeneous team will have a harder time challenging each others' opinions. On the other hand, as we understand from section *5.1.3 Homogenous teams*, in homogenous teams, we often find individuals with overlapping knowledge. Thus, the homogeneous team will have fewer individual knowledge gaps and be more able to bring up knowledge gaps during discussions. Therefore, we propose that dependency on one individuals' knowledge increases the team's vulnerability to individual knowledge gaps.

Team knowledge gaps are more severe as they represent gaps in the teams' shared knowledge. We found these knowledge gaps to originate either from individual knowledge gaps, accepting one team members' speculative statement as truth, or through the lack of a critical voice. We see from section *5.1.2 Heterogenous teams* that heterogeneous teams have an abundance of critical voices, protecting them from team knowledge gaps. In comparison, homogenous teams are more prone to lack a critical voice. Hence, they are more vulnerable to team knowledge gaps. The result of team knowledge gaps is equal to those of individual knowledge gaps. Both lead the team to deprioritize hypotheses probing through networking, ultimately forcing the feasibility study into a dead end.

In order to avert team knowledge gaps originating from individual speculations being determined as truth, our findings suggest communication with a focus on honesty and openness to be beneficial. Referring to section *5.1.1 Commonalities,* open and honest communication are facilitated by the teams' cohesion resulting from a shared cognition (Foo, Sin and Yiong, 2006). Since the team cohesion might be reflected through social integration, we see that social activities decrease knowledge gaps (Chen, Chang and Chang, 2017). If honest and open communication is not feasible, the gap can be discovered by interacting with mentors acting as an external "critical-voice". The use of VCP resources to discover knowledge gaps indicate their importance in the nascent entrepreneurs' exploration of business opportunities.

5.3.1 Summary of knowledge gaps

Through this chapter, we have recognized the challenge of individual and team knowledge gaps. Further, we interpreted that assessing own knowledge increases the possibility of recognizing individual knowledge gaps, and access to critical voice helps identify team knowledge gaps. Nevertheless, these methods emerged from the few knowledge gaps that were

identified through our research. Therefore, we doubt the methods to be absolute for discovering all knowledge gaps.

5.4 Limitations and suggestions for further research

This chapter presents the limitations of this study, followed by suggestions for further research. Our study is exposed to several limitations that future research should address to solidify this field of research as a whole.

Due to the broad nature of our empirics, we have encompassed several topics in which can be suitable for future research. As this research is done on a single class at one VCP, a similar study on other classes at other VCPs will solidify and validate our findings, and help describe differences between VCPs.

In light of our research, we have identified three potential directions future research can help clarify: Firstly, we found a temporary "chaos management role" recurring occur within the teams. Although this phenomenon seemed beneficial for the teams' progress, we have not found any theories about emerging temporary chaos mediators in nascent entrepreneurial teams. Furthermore, due to the purpose of this research, we were unable to trace this phenomenon's functions and properties. Thus, we suggest that further research can create a deeper understanding of this phenomenon in nascent entrepreneurial teams.

Secondly, the literature claims that novice entrepreneurs prefer causal frames of logic (Dew, Read and Sarasvathy, 2009). Nevertheless, as we found NSE students employ both effectual and causal logic in their decision-making. Hence, it is interesting to see whether VCPs entrepreneurs employ more effectual logic compared to traditional novice entrepreneurs. Research on nascent entrepreneurs before and after being accepted to a VCP can help determine whether the enrolling entrepreneurs have inherent effectual logic or whether this results from being in a VCP program.

Lastly, we discovered that knowledge gaps have a significant influence on entrepreneurial activities. Knowledge gaps in entrepreneurial teams are close to a non-existing field of research in which we have not encompassed any literature helping to address our findings. Due to the potential severe outcomes of knowledge gaps and the lack of existing theory, we consider knowledge gaps a fertile research area. Hence, we highly suggest more research about knowledge gaps within entrepreneurship in general.

5.5 Implications for practice

Through the findings from our study, we have discovered new perspectives that disclose novel insights regarding both VCPs as institutions and the students attending them. In the following chapter, we will summarize the utmost implications our study has to the VCP practice. We have divided these implications into two subchapters: *5.5.1 Implications for VCPs regarding preselection of teams* and *5.5.2 Implications and guidelines for the "Knowledge Management Process" and "Feasibility Subprocess Loop"*

5.5.1 Implications for VCPs regarding preselection of teams

VCP mentors play a significant role in creating consensus, challenging the status quo, uncovering biases, and identifying knowledge gaps. Therefore, VCPs should make sure to have enough skilled mentors available and invest resources in training them. VCP mentors should be aware that team composition affects what teams need help with from them. We suggest VCP mentors should seek out the students regularly as students often do not know when they need help.

All teams should strive to engage in social activities before starting the feasibility study. As it facilitates a shared cognition, cohesion within the team and helps identify knowledge gaps. This is especially important in heterogeneous teams as it also helps them balance critical voices. In addition to this, all teams should adjust workload to limit fatigue simply because workloads causing fatigue are likely to bring more trouble than gain. Finally, as homogenous teams often lack a critical voice, they must engage VCP mentors that can help them initiate constructive discussions.

5.5.2 Implications and guidelines for the "Knowledge Management Process" and "Feasibility Subprocess Loop"

Moreover, we propose using the "Knowledge Management Process" and "Feasibility Subprocess Loop" as a guideline for the exploration of business ideas for future nascent entrepreneurs. In the following section, we summarize our suggestions for what students must pay attention to when using these models as a framework for exploration.

When choosing the initial business idea to explore, a student should thoughtfully consider the industry's attractiveness the idea represents. Mainly due to the strong implications that they should continue investigating within that industry even if the initial business idea is invalidated. Nevertheless, students can choose a business idea that they have little preexisting knowledge about, but this will increase the workload of the feasibility study making it more demanding.

Students should identify several problems within a market and only invalidate and abandon a market if the problems they identify are neither “possible to solve” nor “profitable to solve”. Suppose the students do not possess enough “Solution Knowledge” to determine whether it is possible to create a solution to the identified problem. In that case, they should obtain it through knowledge reservoirs if all thinkable problems and associated markets are invalidated. The students should modify the initial business idea based on the new insights they have obtained. If not, the business idea can be unvalidated to see whether this will unveil new markets. They should then use their accumulated industry knowledge to recognize other opportunities within the same industry. If this fails, they can move on to another industry.

Student teams should create hypotheses relevant to the current "knowledge class" they work with. To ensure agreement, the entire team should help create hypotheses. They should also focus on quality over quantity of hypotheses. When building networks to solve or answer the hypothesis. Students should interact with contacts politely to lay the foundation necessary to develop and strengthen ties later. This helps build and solidify students' networks, which can be useful throughout their studies and later in their careers. Therefore, students should also save contact information in an adequate way to enable easy reconnection with contacts later. Ultimately, students should critically assess their own and team member's knowledge to uncover "knowledge gaps".

We hope that both VCPs and their students can reap benefits from these implications–thereby helping them explore business ideas and validating business opportunities that will solve world problems and simultaneously build successful businesses.

6 Conclusion

The purpose of this study was to investigate how nascent entrepreneurs in VCPs explore business ideas before starting a new venture through answering the following research questions:

RQ 1: *How do preselection of teams affect the exploration of business ideas in a VCP?*

RQ 2: *How does the preselected team explore business ideas in a VCP?*

Our inductive qualitative research shows that the pre-selection of teams has significant influence of the team's ability to explore business ideas in a feasibility study setting. However, the ideas a team can explore is not affected by team composition in terms of heterogeneity or homogeneity, but how well the team function. All teams utilize the existing team resources of knowledge regardless of how well they function, making them able to explore business ideas they possess prior knowledge for.

High-function teams gain resources through leveraging individuals' educational background, personality, and network along with the VCP external mentors and network; enabling them to build the necessary knowledge through the feasibility study to explore any business idea. Therefore, heterogeneous teams' function level depends on balancing the critical voices. In contrast, a homogeneous teams' function level is dependent on the use of an internal or external critical voice.

Business ideas are explored through a feasibility study, where the team starts with an idea which potentially ends with a business opportunity. Through the feasibility study, the team builds knowledge through hypothesis-driven entrepreneurship, with the goal of validating a business idea. The knowledge necessary to validate the business idea is divided into four subsequent classes: (1) Industry knowledge, (2) Market knowledge, (3) Problem knowledge, and (4) Solution knowledge. The teams' first three classes must be obtained, while the fourth class can be accessed through a knowledge reservoir.

Progressing from one class to the next is a three-step subprocess: (1) Forming hypotheses. (2) Learning through networks. (3) Deciding to either move along to the following knowledge class or start over at the same class with new hypotheses. The function level of the team affects how effective the communication during the subprocess is; thus, the function level affects how much knowledge a team can build during the feasibility study.

Preselection of teams in a VCP affects the exploration of business ideas by making the team dependent on managing their function level to build knowledge. The preselected team explores business ideas by building the necessary knowledge for validating the business idea by structured investigating hypotheses.

The use of VCP resources helps the teams organize their resources and ease the discovery of knowledge gaps. Through VCP resources, teams compensate for their inabilities to utilize existing resources and figure out what necessary resources they lack. In addition, the resources provided to the teams help explain how the team-based exploration process cultivates business opportunities: nascent entrepreneur teams rely on a set of external resources.

We strongly believe this study contributes to considerations about managing existing and future VCPs and contributing to how nascent entrepreneurs actively go forward to explore ideas. In addition, we have presented insights addressing our research question by constructing new theories about how nascent entrepreneurs in VCPs identify business opportunities before starting a new venture. Consequently, we have addressed and reduced our mentioned literature gap.

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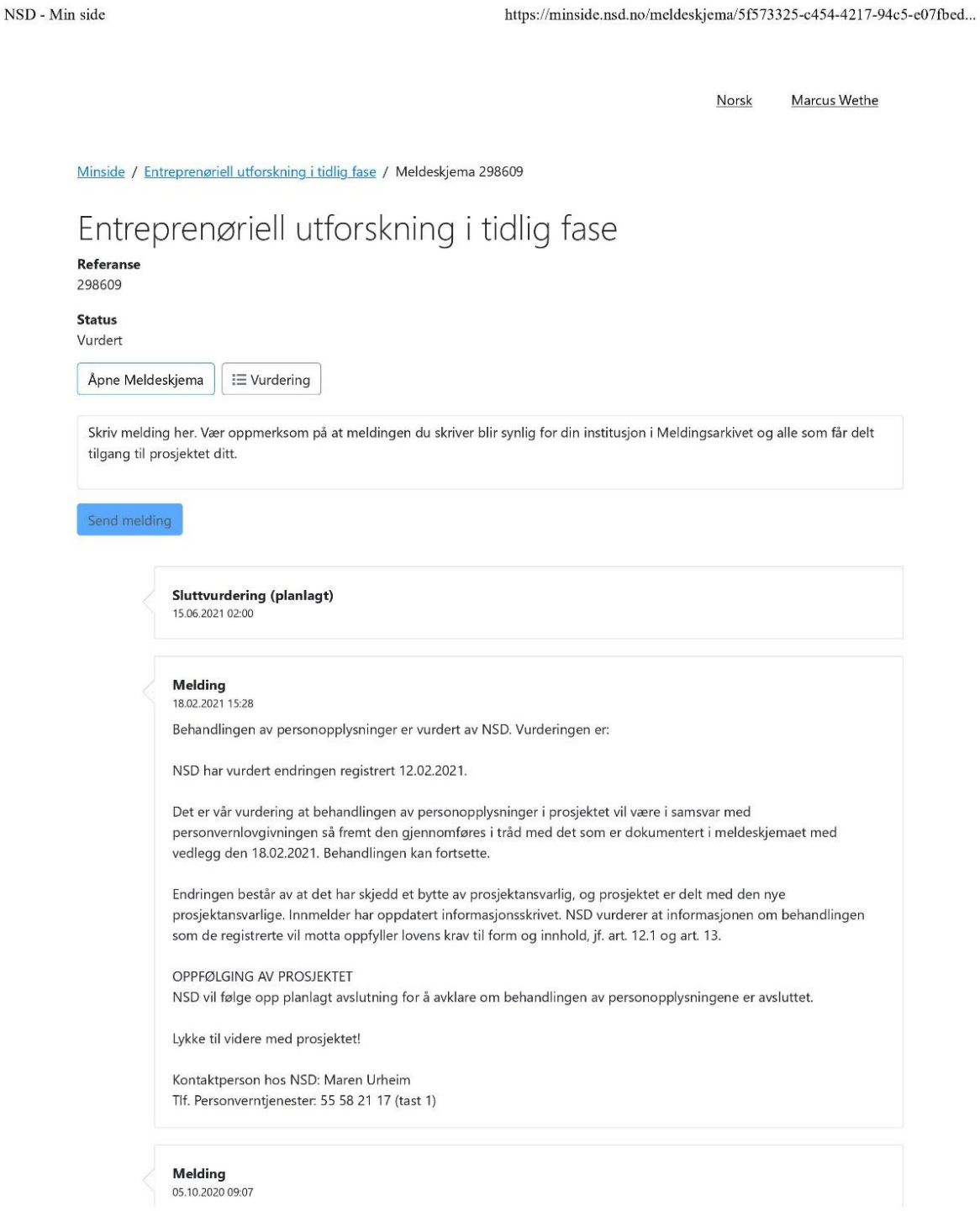
8 Appendices

8.1 Appendix 1: NSD Approval

Norwegian Centre of Research Data's (NSD) review of our use of personal data in this thesis.



Det innsendte meldeskjemaet med referansekode 298609 er nå vurdert av NSD.

Følgende vurdering er gitt:

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 05.10.2020, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

DEL PROSJEKTET MED PROSJEKTANSVARLIG
Det er obligatorisk for studenter å dele meldeskjemaet med prosjektansvarlig (veileder). Det gjøres ved å trykke på "Del prosjekt" i meldeskjemaet.

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

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 15.06.2021.

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes 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), innsyn (art. 15), 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. 12.1 og art. 13.

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

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)

Melding
03.10.2020 13:09

Kvittering på at meldeskjema med referansekode 298609 er innsendt og mottatt.

Melding
18.09.2020 14:17

Det innsendte meldeskjemaet med referansekode 298609 må kompletteres for at NSD kan fortsette vurderingen.

Når du har gjort oppdateringene i skjemaet, må du gå til siden "send inn" og trykke "bekreft innsending".

Dersom du har ytterligere kommentarer eller spørsmål kan du skrive en melding i dialogfeltet over og trykke "send melding".

Følgende kommentar er gitt av NSDs personvernrådgiver:

Hei igjen,

Det meste ser fint ut nå, men før jeg kan sende deg en vurdering må du oppdatere informasjonsskrivet med følgende:
1) Du må ha kontaktinformasjon til deres lokale personvernombud ved NTNU under "Hvor jeg kan finne ut mer?" Tror at han heter Thomas Helgesen, men dette må du dobbeltsjekke.
2)Du må informere om prosjektets varighet: 01.12.2020.

Ha en fin dag videre.

Melding
16.09.2020 15:56

Kvittering på at meldeskjema med referansekode 298609 er innsendt og mottatt.

Melding
11.09.2020 13:40

Det innsendte meldeskjemaet med referansekode 298609 må kompletteres for at NSD kan fortsette vurderingen.

Når du har gjort oppdateringene i skjemaet, må du gå til siden "send inn" og trykke "bekreft innsending".

Dersom du har ytterligere kommentarer eller spørsmål kan du skrive en melding i dialogfeltet over og trykke "send melding".

Følgende kommentar er gitt av NSDs personvernrådgiver:

Hei og takk for innsendt meldeskjema. Det er et par ting vi ønsker at du ser på før du sender inn meldeskjemaet på nytt:

- Ber deg beskrive rekrutteringsprosessen nærmere på siden Utvalg 1.

- På siden «Behandling» bør du huke av for at «Prosjektansvarlig» behandler/har tilgang til opplysningene.

- Ettersom du har indikert at du bruker koblingsnøkkel, vil det være nødvendig å slette denne ved anonymisering. Vi ber deg derfor gjøre dette og markere det i meldeskjema under «Hvilke anonymiseringstiltak vil bli foretatt?» på siden «Varighet».

- Informasjonsskrivet ditt er mangelfullt. Du mangler blant annet informasjon om prosjektets varighet (dette må du informere om uansett når du velger å slette lydopptakene), behandlingsgrunnlag (samtykke), kontaktinformasjon til din veileder og deres lokale personvernombud osv. Ta gjerne utgangspunkt i vår mal, men husk at alt som står i svart tekst er obligatorisk og skal ikke slettes:
nsd.no/personvernombud/dok/veiledende_mal_for_informasjonsskriv-8.doc

Ha en fin dag videre.

Melding
08.09.2020 09:41

Kvittering på at meldeskjema med referansekode 298609 er innsendt og mottatt.

ba91298b

8.2 Appendix 2: NSE application form

NTNU
Kunnskap for en bedre verden

APPLICATION
NTNU School of Entrepreneurship
(2-YEAR MASTER STUDY)

The document must be filled in and delivered as a pdf in the application web. The document must be a maximum of three pages of Times 12 Roman font in size 12.

NAME:

BIRTH AND PERSONAL NUMBER:

E-MAIL:

PHONE NUMBER:

EDUCATION (WHAT, WHEN AND INSTITUTION):

HOW DID YOU FIRST HEAR ABOUT NTNU School of Entrepreneurship? (friends / acquaintances, posters, stand, in lecture, through social media or other:

- Describe yourself
- Tell about the commitment you have, or have had, or the initiative you have implemented
- Why are you applying for this program and what are your expectations?
- Have you achieved any achievements you are particularly proud of?
- Describe a person you think is "entrepreneurial" and how he or she inspires you.
- What makes you suitable for leading and developing new technology ventures?
- What experiences do you have from working in a team, and how do you work in such a setting?
- You do not have to have your own ideas to start at NTNU School of Entrepreneurship, but we encourage students to bring their own ideas for quality assessment in the master's program. Do you have your own business ideas? Give a short description here.
- What types of ideas or problems do you want to work on?
- Mention something you would change in society - and how you would do it?

8.3 Appendix 3: Prequalification template

Prequalifying goal, structure and template

Goal: Minimize the risk of crashing an idea early in the feasibility study week.

Structure: Short paragraphs and bullet points.

Length: No longer than 3 pages.

Content:

1. What is the problem and who has this problem?
2. Who do you think the customer is? Here you can make your hypotheses about who the customer is.
3. Why are you choosing this idea?
4. What are you planning to investigate next week?
5. Who are you going to contact during the feasibility study-week?
6. Contact log (overview of the persons the group have been in touch with)

8.4 Appendix 4: Feasibility report template

Feasibility study report template

It is not mandatory to include all the points in the template that follow. You must make independent assessments of which aspects are most important to highlight in the analysis. If there are points that are less relevant, you spend less time / space on it. The report shall not be longer than 10 pages excluding front page, table of contents, sources and appendices. Contact log is mandatory as an attachment.

Front page

Remember to leave enough open space for the panel to write comments at the front of the document.

Summary

The summary is the most important page in the document. It should give the reader a concise, quick and comprehensive overview of what the analysis and the rest of the document describe. Is typically approximately one page and covers all the main points and findings from the feasibility study.

1. Product and product concept

1.1 Problem and current solution

What problem do you solve / What need do you create? How critical is the problem/need? How/how satisfactorily do today's solutions serve this?

1.2 Description of the product/service

Provide an understandable and concise description of the product/service and any underlying technology. Description and analysis of any research and development behind the intended product/service. Feel free to use user scenarios to illustrate customer value. Illustrations, pictures and/or drawings are highly recommended and a good practice.

1.3 IPR

How to protect the business idea? How critical is formal IPR protection such as patenting? How difficult is it to copy the idea / product? What has been done and what should/can be done?

1.4 Scalability and growth potential

What is the scaling potential of the business? Ask yourself the question: What challenges arises if the company is to go from selling 10 products/services to 1,000,000 products/services? Can one expand with the same concept to more geographic markets? What other uses can the product/service be transferred to?

1.5 Product status and planned development course

What is the status of the technology/product/service today? What do idea holders, professionals/experts say, and what is the team's assessment/analysis about the development process of the company?

Present milestones that estimate critical development activities and how long will it take to arrive at an MVP, prototype, proof of concept, market entry etc?

1.6 Level of innovation

What are the unique aspects of the idea? Does the idea represent a radical or incremental improvement of existing solutions? Does the idea introduce a new type of product, market, process/method or organization?

2. Market and industry analysis

2.1 Industry description and trends

Overall description of the industry (s) the product/service should/can be marketed? What characterizes the structure of the industry (consolidated, fragmented)? What phase is the industry (early, growth, mature, declining)? Key trends in the industry and their positive/negative consequences for the project?

2.2 Market, customer segmentation and value chain

How can the market be segmented overall? How big is the market (preferably per segment)? What does the business chain look like, what type of actors are involved and what is the possible location for the project?

2.3 Customer and user benefit

Who is the customer and end user? What are the characteristics of the customer who has the greatest advantage of adopting/switching to this product/service? Quotes from potential customers and users as a basis for their analysis are good practice.

2.4 Purchase criteria and entry barriers

What are the key purchase/use criteria for customer and end user? How much improvement does the customer need before switching to this product/service? What are the customer's switching costs? Quotes from potential customers and users as a basis for their analysis are good practice (for example, "I buy the product if A, B, C.") What factors prevent the entry of new players? Are there lock-in effects or other barriers set up by established players in the market? Are there complicated and / or integrated value chains that prevent entry?

2.5 Competitors and substitutes

What/Who are key competitors and/or substitutes? Competitor is one who creates similar solution as theirs. Substitute is one that solves the problem, but in a different way. All products/services have competitors/substitutes. Figures that position this product/service with substitutes/competitors are good practice. Also remember to have a relationship with competing companies, not just solutions.

3. Business model

3.1 Business model

What overall business models are possible/recommended for a company based on this idea. With a business model, one thinks of how a company “creates, delivers and captures value” and describes the logic of how a company operates on both the revenue and cost side[1]. Should the company consider a short-term and later long-term business model? Can you identify innovations in the business model that can give the company a competitive advantage?

[1] Students are encouraged to learn more about business models in, for example: Osterwalder, A. and Pigneur, Y. 2010. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley & Sons Inc, Hoboken, New Jersey

3.2 Marketing and distribution

How are you going to reach the customer? Which marketing channels should/should be used? How can/should the product be distributed (own distribution, partner distribution)

3.3 Production and logistics

How can/should the product/service be produced? What are the consequences of alternative choices? Can one estimate production cost at different volume levels?

3.4 Sustainability

Describe the product/service's impact on the elements human, society and environment. On each of these elements you should either choose "to a positive degree", "neutral", or to a "negative degree".

4. Organization

4.1 Professional environment and idea owner / idea institution

Who is the idea owner/idea institution? What is the background of the idea holder? What other people/actors are involved? Is it a previous/existing team? Who has formal rights to the idea? What is it that makes these people able to "do it", and what are their commitments and ambitions?

4.2 The role of a team from NSE

What does the idea owner say about working with a team from NSE and what role does he want this team to have? Does the idea holder understand the students' real involvement? What clarifications must be made between the idea holder(s), team and any 3rd party(s) (commercial rights and further development, options and ownership interests, project responsibility and any day-to-day management/composition of the board)? Feel free to describe in detail the role of an NSE team, how big the team should be and which skills that are needed.

5. Economy

5.1 Overall economic potential

Describe the overall economic potential through analysis of different development scenarios based on the product and market analysis. Focus on cash flow and critical cost drivers.

5.2 Capital requirements

How large is the capital requirement in different phases (product development phase, commercialization phase) and what factors are key drivers of the capital requirement (technology development, market processing, logistics etc)? When does the company need capital injections?

5.3 Financing

What types of funding sources are relevant for the idea beyond "kind money" from Innovation Norway and Spark* NTNU.

6. The group's assessment

Is this a project to continue with at NSE? Why? Where are the challenges? What must be clarified to be able to take a conclude on this?

7. Contact log (Mandatory attachment)

Supplementary documentation is essential for a team to be able to later use the information for the feasibility study in any start-up of a project based on the feasibility study. Imagine that the contact log can be read and understood by people who did not take part in the feasibility study.

8.5 Appendix 5: Interview guides

First interviews:

1. Map how the process worked out the previous week
    a. How/what/why
2. Map how the informant's domain knowledge aligns with the needs of the business idea
    a. The business ideas' field of subject
        i. Academic
        ii. Market
    b. The informant's domain knowledge
        i. Theoretical background
        ii. Practical background
        iii. Relevant experiences from similar areas
3. The informants' prerequisites for doing the feasibility study
    a. Role in the team
    b. Preexisting network
    c. Team composition (similarities/differences)
        i. How did it work
    d. d. Mentors
    e. Use of time
4. The type of knowledge that has been in focus during the process
    a. Technical knowledge (for product development) (?)
    b. Market knowledge (Porter) (?)
    c. Insights from customer(?)
    d. Business development knowledge(?)
5. How and why did this type of knowledge become the focus?
    a. Individual process(?)
    b. Internal process(?)
    c. External input(?)
        i. Gate keeping(?)
6. What value did the knowledge provide to your understanding of the business opportunity?
    a. New knowledge defines a new demand(?)
    b. New knowledge satisfies a new need(?)
7. How can you exploit your experiences in your next feasibility study?

Second round of interviews:

1. How the process worked out the previous week
2. Domain knowledge vs. the knowledge necessary in order to pursue the business opportunity?
    a. Any experience within the market you were investigating?
3. The informants' prerequisites for doing the feasibility study
    a. Your role in the team?
    b. Any network?
    c. Team composition (similar/different personalities/backgrounds)
        i. How did it work
    d. Mentors
    e. Use of time
4. What similarities exists between this feasibility study and the previous one?
    a. How did you experience this one compared to the last one?
    b. Any differences?
5. What types of knowledge have been your focus during the process?
    a. What did you focus on during this feasibility study?
    b. Who?
6. Why did you focus on this particular type(s) of knowledge?
    a. If you could've done it similar again, or differently?
    b. How did this knowledge become the focus?
        i. Individual process(?)
        ii. Internal process(?)
        iii. External input(?)
            1. Gate keeping(?)
7. How did the information help you understand the business opportunity?
    a. Are there anything else you should've thought about?
8. How can this experience be used in your next feasibility study?
    a. Any experiences?

Third round of interviews:

1. How the process worked out the previous week
2. Domain knowledge vs. the knowledge necessary in order to pursue the business opportunity?
    a. Any preexisting knowledge within the field you were investigating?
3. The informants' prerequisites for doing the feasibility study
    a. Any network?
    b. Role in the team?
    c. Team composition (similar/different personalities/backgrounds)
        i. How did it work
    d. Mentors
4. What similarities exists between this feasibility study and the previous one?
    a. How did you experience this one compared to the last one?
    b. Any differences?
5. What types of knowledge have been your focus during the process?
    a. What did you focus on during this feasibility study?
    b. Who?
6. Why did you focus on this particular type(s) of knowledge?
    a. If you could've done it similar again, or differently?
    b. How did this knowledge become the focus?
        i. Individual process(?)
        ii. Internal process(?)
        iii. External input(?)
            1. Gate keeping(?)
7. How did you acquire the information
    a. How did you interpret the information
    b. Describe your process of achieving this
        i. Conversation specifically: how did you go forward
    c. Can you describe how you should go forward in order to acquire the information you need to get
        i. How will you manage the information afterwards
8. How did the information help you understand the business opportunity?
    a. Are there anything else you should've thought about?
9. How can this experience be used in your next feasibility study?
    a. Any experiences?

Fourth round of interviews:

1. Explain (if any) differences between the feasibility studies you have been through
2. Domain knowledge vs. the knowledge necessary in order to pursue the business opportunity?
    a. Did product knowledge affect the feasibility study? (how)
    b. Did solution knowledge affect the feasibility study? (how)
    c. Did insights from the market affect the feasibility study? (how)
3. Other important factors (?)
    a. Network before starting?
    b. Role in the team?
    c. Team composition (similar/different personalities/backgrounds)
        i. How did it work
    d. Mentors
4. Are there any similarities between this feasibility study and the ones you've had before?
    a. Any similarities/differences
5. What types of knowledge have been your focus during the process?
    a. What did you focus on during this feasibility study?
    b. Who?
6. How did the focus on this particular type(s) of knowledge occur?
    a. How was the process of finding out what you should find out?
        i. Individual process(?)
        ii. Internal process(?)
        iii. External input(?)
            1. Gate keeping(?)
        iv. Experience (?)
7. What value did the knowledge have for your understanding of the business opportunity?
8. What do you think should be focus during a feasibility study?
    a. Why?
9. How can this experience be yielded in your next feasibility study of a business opportunity?
10. Have you experienced that there are any approaches that are beneficial during a feasibility study?
    a. How/why

8.6 Appendix 6: Data analysis

Complete data structure inspired by the Gioia Approach

1st-order concepts	Theoretical subcategories	Theoretical categories	Aggregate theoretical categories
Lack of knowledge does not disable discovering of opportunites	Building knowledge	Knowledge building	Entrepreneurial knowledge management
Team preexisting knowledge increases efficiency of the feasibilty study			
Structured information gathering increases quality of feasibility study			
Structured information gathering increases efficiency of feasibility study			
Structured information gathering enables the use of hypotheses			
Unstructured information gathering increases efficiency of feasibility study			
Lack of structure in information gathering reduces efficiency of feasibility study			
Lack of structure in information gathering reduces quality of feasibility study			
Initial information gathering increases knowledge the most			
Knowledge from a feasabillity study enables pursuing a business opportunity			
Going from width to depth of information increase potential for discovering of business opportunity			
Passion for an industry affects motivation			
Phone calls are the best method for information gathering			
Knowledge sharing in team increasaes efficiency			
Team communication facilitates knowledge sharing in team			
Gathered information is interpreted different within the team			
Difference in team knowledge reduce quality of discussions			
Perceived individual knowledge relevance change during feasibility study	Sources of knowledge		
Leveraging team knowledge increases quality of feasibility study			
Lack of team preexisting knowledge decreases efficiency of information gathering			
Team preexisting knowledge enabled discovering solutions			
Team preexisting technology knowledge help understanding the solution			
Beeing the "problem-experiencer" is the absolutly best source of information about problem			
One informant act as source to several types of knowledge			
Public information makes it easier to verify economic potential of opportunity			
State officials as a resource for Information gatehring			
Industry actors as a way to validate feasibility of a solution			
Competitors as a sources of several types of information			
Competitors as a source of information about a problem			
Team preexisting network as a resourcs for information gathering			
Team preexisting network in family as a resourcs for information gathering			
Acquiering industry knowledge helps identify business opportunities	Industry Knowledge	Knowledge classifications	
Acquiering industry knowledge increase quality of feasibility studies			
The individual sense of responsibillty increses with industry-knowledge level			
Lack of industry-knowledge results in need for extensive information gathering			
Lack of team preexisting industry knowledge decreases efficiency of information gathering			
Team preexisitng knowledge of industry enables discovering of opportunities			
Market knowledge helps distinguish between customer and user	Market knowledge		
Market knowledge is neccesary to define a solution			
Market knowledge is neccesary to define a problem			
Market knowledge is important to determine whether an idea can become a new venture			
Information about market is valuable for a feasibility study			
Information about customer is valuable for a feasibility study			
Absence of willingness to pay devalidates a market			
Identifying actors in a market is time consuming			
Lack of market knowledge results in need for extensive information gathering			
Identification of problems are neccesary to define solutions	Problem knowledge		
Identifying problems is time consuming			
Acquiering problem knowledge increase quality of feasibility studies			
Problems must be severe enough to be attractive for feasibility studies			
Markets with unsolved problems and willingness to pay are attractive for feasibility studies			
Problem severity correlates with willingness to pay			
Focus on problems gave market-knowledge			
Informants knowledge about problem affected solution			
Lack of solution-knowledge does no disable discovering of opportunites	Solution knowledge		
Knowledge about solution increases problem knowledge			
Detailed focus on solutions reduce efficiency of feasibility study			
Focus on solutions reduces quality of information gathering			
Solution flexibility allows adjustments as knowledge increases			
Identifying users solution requierments increase quality of feasibility study			
Teams knowledge of solution affects the quality of the feasibility study			
Team knowledge of solution helps identify competitive advantages			
Focus on solution inhibits identification of markets			
Predefined solutions requires identification of relevant industry problems			
Team preexisitng knowledge of solution enables discovering of opportunities			
Informants knowledge about solution affected team decision making			
Information gathering reduces team knowledge gaps			
Industry actor as a way to cover team knowledge gaps			
Industry expert as a way to cover team knowledge gaps			

1st-order concepts	Theoretical subcategories	Theoretical categories	Aggregate theoretical categories
Industry expert as a way to cover team market-knowledge gaps	Discovering knowledge gaps	Knowledge gaps	
Mentors as a way to uncover knowledge gaps			
Senior students as a way to cover team knowledge gaps			
VCP staff as a way to cover team knowledge gaps			
Honesty and openess in the team enables identification of knowledge gaps			
Going from width to depth of information reduces knowledge gaps			
Specialized knowledge within a subject uncovers knowledge gaps			
Structured use of hypotheses enables discovering of knowledge gaps			
Team knowledge gaps are hard to discover	Sources of knowledge gaps		
You dont know when you need external feedback			
Lack of information gathering promote knowledge gaps			
Lack of critical voice-role in a team creates knowledge gaps			
Lack of contact with mentors reduce quality of feasibility study			
Team knowledge gaps reduces efficiency of information gathering	Effect of knowledge gaps		
Few knowledge gaps reduce demand for external input			
Team knowledge gaps disable abillity for structure			
Lack of knowledge results in need for extensive information gathering			
Lack of team preexisting knowledge decreased team functioning level			
Lack of team preexisting knowledge triggers need for regularly team communication			
Team knowledge gap identification increases quality of information gathering			
Lack of interdisciplinarity in team reduces quality of feasibility study	Team diffrences and similarities	Team composition	Entrepreneurial teams
Lack of interdisciplinarity in team creates an unproductive narrow focus			
Heterogene personalities in a team improves quality of feasibility study			
Heterogene work-prefences in a team improves quality of feasibility study			
Interdisciplinarity in a team improves quality of feasibility study.			
Heterogene work-prefences in a team decrease quality of feasibility study			
Team resources constraints what opportunities a startup team can pursue			
Heterogenity in a team enables high function teams			
Heterogenity in a team increases misunderstandings			
Homogenity in a team reduces misunderstandings			
Homogeneous team of strong personalities decreases team functioning level			
Homogeneous team of strong personalities disables definition of roles			
Homogeneous team of strong personalities increases conflictlevel			
Heterogeneous personality in teams does not increases conflictlevel			
Team patience incrased individual motivation			
Openness in team fassilitates productive discusions			
Lack of information gathering skills reduces usability of gathered information	Team skills		
Information gathering skills as a resource for accessing information			
Information gathering skills as a resource for accessing information			
Prototyping skills enable testing of a business opportunity			
Lack of prototyping skills reduce ability to test business opportunity			
Feasability study experience enables discovering of opporunities			
Lack of executing ability in a team decrease efficiency			
Feasibility studies increase information gathering skills			
Self confidence in information gathering increases effeicency of feasability study			
Leadership is necessary for execution	Leadership roles	Team structure through leadership	
Lack of leadership reduces execution			
Team leader can prevent chaos			
Knowledgeable individuals can be chosen as informal leaders			
Lack of leadership does not reduce quality of feasibility study			
Team leader must balance control and motivation of team			
Passionate individuals can become informal leaders			
Team size correlates with necessity of leadership			
Leaders can unite the group			
Leaders can create structure			
A "controll-role" in the team enables identification of knowledge gaps			
A critical voice-role in team helps validate solution feasibility			
Lack of critical voice-role in a team disables productive discussions			
Preexisting knowledge defines team roles			
Team functioning level affects dicovery of business opportunity	Factors increasing team functioning		
The outcome of a feasibility study is dependent on team functioning level			
In high function teams lack of role clarification do not reduce quality of feasability study			
Constructive feedback increases team functioning level			
Clarification of expectetations promotes high-functioning teams			
Social relations increase team functioning level			
Social activities increase team functioning level			
Trust increases team functioning level			
Good team atmosphere enables high function team			
Well functioning team communication increased team functioning level			

1st-order concepts	Theoretical subcategories	Theoretical categories	Aggregate theoretical categories
Clarification of expectetations increases motivation		Team emotions	Team-based exploration process
Clarification of expectetations increases quality of feasabillity study			
Well functioning team communication increases team motivation			
Individual passion for a business opportunity motivates team			
Lack of structure decreases team loyalty	Factors decreasing team functioning		
Lack of team loyalty increase conflict level			
Overwork increase conflict level			
Unexpected challenges does not affect conflictlevel			
Bad team atmosphere promotes low function team			
Low-functioning teams creates frustration			
Inabillity to cooperate creates low function teams			
Low-functioning teams increases the need for structure			
Low-functioning teams decrease motivation			
Low-functioning teams fails to identify business opportunities			
Individual passion for a business opportunity reduces openness			
Lack of individual passion reduces team communication			
Informants as a source of network	Networking	Hypothesis-driven entrepreneurship	
Building networks is time consuming			
Preexisitng network crucial for feasibility study			
Preexisitng network not relevant for feasibility study			
Lack of preexisting network does not affect abillity to build a network			
Hetrogenity of informants increases quality of market information			
Alumni students are a resource for feasability studies			
Feedback from mentors are valuable for feasibility study			
Validating hypotheses increase motivation	Use of hypothesis		
Use of hypothesis increase quality of feasability study			
Use of hypothesis increase efficiency of feasability study			
Common hypothesis creates a structure			
Biases as a disabler for discovering opportunities	Biases - process "støy"		
Ownership to work biases decision making			
Creating "absolute truths" increases biases			
Creating "absolute truths" decreases ability to pivot in a feasibility study			
The informants biases affects gathered information quality			
The informants biases can be reduced by a critical mindset			
Unbiased informants increase gathered information quality			
Infromation gathering as a counterforce for biases			
Positive feedback biases decision making			
Less preexisting knowledge decrease biases			
More preexisitng knowledge increases biases			
Individual passion for a business opportunity biases decision making			
Lack of passion for a business opportunity biases decision making			
Democracy is important in decision making	Decison making		
Lack of team knowledge reduces quality of decision making			
Lack of motivation increases bad pivot decision			
Decision making will always be prone to uncertainty			
Exessive information gathering causes lack of decision making			
Gathered information determines what to do next			
Time constraints rush descision making			
Well functioning teams listen and reflect prior to descision making			
Undemocratic leader reduces motivation			
Low-functioning team communication decreases decision quality			
Well functioning team communication increases decision quality			
Team preexisitng knowledge enables discovering of opportunities	Selection of business ideas	Exploration of business ideas	
Only early-stage concepts are attractive for feasibility studies			
B2C cases are less attrative for feisability studies compared to B2B cases			
Origin of business idea affects individual sense of responsibility			
Passion for a business opportunity inhibited discovery of other business ideas			
VCP staff neccesary to choose business idea for feasibility study			
Market knowledge alone is not sufficient to validate a business opportunity	Validation of business ideas		
Markets must be large enough to be attractive for feasibility studies			
Solution feasabillity validates a business opportunity			
Need for solution validates a business opportonity			
Willingness to pay validates a business opportunity			
Customer information gathering to uncover opportunity potential			
Inabillity to scope reduces potential to validate business opportunities			
Inabillity to identify a market invalidated the business opportunity			
One business idea can have several business models			
Determining business model is a continous process			

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