



LUND UNIVERSITY  
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# Start-ups' perception of collective learning in accelerators

An exploratory multi-case analysis of European accelerators

by

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May 2018

Master's Program in Entrepreneurship & Innovation

New Venture Creation

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# Abstract

**Problem** - Although experiential and social learning theory have contributed to our understanding of the entrepreneurial learning process, a major limitation is the focus on learning of the individual entrepreneur. As most start-ups work in teams, understanding the organizational learning process is important.

**Aim** - The purpose of this study is to discover how start-ups learn by participating in an accelerator. As both teams and the accelerator environment is considered as social, the study applies collective learning theory to understand the organizational learning in accelerators. In particular, the research focuses on the three elements coaching, mentoring and Demo Day and aims to unravel what leads to a perception of collective learning

**Methods** – To answer the research question, qualitative data based on five case studies of European accelerators were collected. The case studies build on five interviews with accelerator directors and nine start-up alumni that participated in the accelerator.

**Results** – A set of eight variables was identified during the data analysis and categorized based on the three elements (coaching, mentoring, Demo Day). The findings show that all three elements are important for a perception of collective learning. The mentoring was the most important element, as the match-making and interactions uncovered for start-ups what to learn and how to learn it. Other important elements comprised social (“peer”) learning and tailoring in coaching, the investor match-making and the importance of the Demo Day.

**Implications** - This is the first study to introduce collective learning as theoretical lens for start-ups by using a new form of early-support accelerators. Due to the novelty of the findings and the limited generalizability, future research should develop quantitative measures of collective learning.

**Keywords:** collective learning, accelerator, mentor, entrepreneurial learning, coaching

# Acknowledgements

The authors of this would like to acknowledge and thank for the help and guidance provided by Diamanto Politis and Anna Brattström as supervisors. Furthermore, we highly appreciated the support of our classmates during the supervisions and throughout the entire year.

Even more important for the finalization of this work were the 14 individuals that gave us their valuable time as interview partners, especially considering the busy and frantic times they had as entrepreneurs or program managers.

We also want to thank our partners and families for their support while we navigated our way through this busy and tricky time of our lives.

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# List of abbreviations

AI	Artificial intelligence
BA	Business angel
CEO	Chief executive officer
HR	Human resources
IPA	Interpretative phenomenological analysis
Medtec	Medical technology
PR	Public relations
REDI	Regional entrepreneurship development index
SEO	Search engine optimization
SME	Small and medium-sized enterprises
VC	Venture capital

# 1 Introduction

## 1.1 Background

Start-ups are and always have been an important actor in the business environment due to their capacity to employ new staff (Birch, 1979) or their capability to disrupt and innovate complete industries (Hill & Rothaermel, 2003; Yu & Hang, 2010). However, nascent entrepreneurs and young start-ups face various difficulties during their entrepreneurial process termed liabilities of newness and smallness (Bruderl & Schussler, 1990; Freeman, Carroll, & Hannan, 1983; Kale & Ardit, 1998) or legitimacy (Delmar & Shane, 2004; Zimmerman & Zeitz, 2002). Additionally this process is accompanied with a limited mastery of entrepreneurial competencies, even though the entrepreneur is highly self-confident (Busenitz & Barney, 1997; Koellinger, Minniti, & Schade, 2007; Miles et al., 2017). Looking for mitigating factors, researchers found that prior (start-up) experience and business knowledge positively affects the skills, preferences and attitudes of entrepreneurs for opportunity recognition (Politis, 2005) and the general performance (Davidsson & Honig, 2003; Gimeno, Folta, Cooper, & Woo, 1997).

Using experiential and social learning theories, researchers have understood how the learning process leads to knowledge of “know-what”, “know-how” and “know-who”. However, a major caveat of these theories has been their limited ability to explain how learning takes place on a group level rather than on the individual level. For instance, research discovered that entrepreneurs can learn from others (“peers”) (Cope, 2005; Hamilton, 2011; Taylor & Thorpe, 2004). And that teams increase firm survival (Lechler, 2001; Teal & Hofer, 2003), emphasizing the importance for organizational learning. One influential organizational learning theory is collective learning. Capello (1999, p. 354) defines collective learning as a “a social process of cumulative knowledge, based on a set of shared rules and procedures which allow individuals to coordinate their actions in search for problem solutions”.

Different support systems for start-ups have existed, ranging from the incubator models to co-working spaces that address diverse needs. During the last decade, a new version of early-support program emerged, the so-called accelerator program. The first accelerator - Y



Combinator - was founded 2005 in the US and focused its efforts on start-ups in the seed stage. This model was adopted worldwide and sparked the evolution of a new industry aimed at helping technology start-ups to succeed. In the literature, accelerators are described as “learning-oriented, fixed-length programs that provide cohorts of ventures with mentoring and education”, offering start-ups a high level of learning support (Cohen, Bingham, & Hallen, 2017, p.6)

## 1.2 Research purpose

Contemporary literature has mostly defined the accelerator phenomenon. Despite accelerators’ success in terms of attracting external funding and the corresponding attention in the media, only limited knowledge about how learning is facilitated in accelerator programs. Cohen (2013) was the first to investigate the learning process of start-ups in accelerator and concluded that accelerators helped start-ups acquire skills and changed preferences beneficial for the firm’s survival through a generalized structure. Nevertheless, some of the results they found stand in contrast to the collective learning literature emphasizing the need for a tailored and individualized learning experience. As accelerators offer a variety of social learning opportunities in the form of the workshops, mentoring and Demo Day, further analysis through a collective learning lens appears necessary.

The purpose of this study is to discover how start-ups learn by participating in an accelerator. As both teams and the accelerator environment is considered as social, the study applies a collective learning approach (Wise & Valliere, 2014). In particular, the research focuses on the three elements coaching, mentoring and Demo Day and uncovers what collective learning determinants play a crucial role in facilitating the learning. The proposed research question in this study comprises two aspects: First, we want to explore if start-ups perceive coaching, mentoring and the Demo Day as efficient ways to acquire knowledge about “know-what”, “know-how” and “know-who”. Second, if this is the case, we want to explore what this perception relies on.

Given the explorative and inductive nature of this study, the study applies a qualitative approach by using semi-structured interviews with both accelerator directors and start-ups. As research has begun to untangle the effectiveness of accelerators for helping start-ups survive, this study is the first one that examines this effect through a collective learning lens.

## 1.3 Outline of the study

This study is divided in four main sections. Chapter 2 reviews the existing literature in the field, combining insights from the literature on entrepreneurial learning and start-up support systems. Afterwards, Chapter 3 describes the methodology, including the research design, the sampling criteria for the accelerator as well as the start-ups, the data collection and analysis process. Chapter 4 illustrates the main empirical findings for collective learning from an accelerator and start-up perspective. In this section, eight variables are introduced that were discovered through the coding process. The findings show that all three elements were perceived as important collective learning determinants. In particular, mentoring was described as the most important element, because both the match-making and mentor interactions were important variables to support collective learning. Both elements uncovered what to learn and how to learn it from a start-up perspective. Other important elements comprised social (“peer”) learning and tailoring in coaching and investor match-making activities. In chapter 5, the findings are discussed in relation to the existing theoretical literature, discovering new themes and finding support for existing observations. The findings comprise important and novel discoveries, because this study is the first attempt to introduce collective learning as theoretical lens for start-ups in accelerators. Due to the novelty of the findings and the limited generalizability, implications for future research with quantitative measure of collective learning are discussed. In a final step, the findings are summarized in the conclusion.

## 2 Theoretical framework

### 2.1 Entrepreneurial learning

Entrepreneurial learning as life-long process is central to entrepreneurs, because beneficial learning outcomes range from increased effectiveness in opportunity recognition (Kirzner, 2015; Politis, 2005; Shane & Venkataraman, 2000) to improved entrepreneurial skills and competencies (Morris, Webb, Fu, & Singhal, 2013; Young & Sexton, 1997). To achieve those beneficial learning outcomes, entrepreneurs have to master three types of knowledge: know what to learn, know how to learn and know who to learn it from (Gibb, 1993, 1997). Agreement exists for five key tenets for this processes' nature (Preedy, 2018). First, entrepreneurial learning is affected by prior experience and knowledge (Minniti & Bygrave, 2001; Politis, 2005; Rae, 2000). Second entrepreneurial learning is dynamic and individualized (Cope & Watts, 2000; Harrison & Leitch, 2005; Minniti & Bygrave, 2001; Politis, 2005; Rae & Carswell, 2001). Third, entrepreneurial learning can be empowered by in- or extrinsic motivations (Baron, 2008; Cardon, Wincent, Singh, & Drnovsek, 2009; Cope & Watts, 2000; Rae & Carswell, 2001). Fourth, effectuation and cognitive capabilities influence entrepreneurial learning (Corbett, 2005; Fisher, 2012; Sarasvathy, 2001; Shane & Venkataraman, 2000; Young & Sexton, 1997). Last, the overall social environment has an important role for entrepreneurial learning. (Rae, 2005; Taylor & Thorpe, 2004). However, beyond these five key tenants, no consensus exists on the best way entrepreneurs can be taught this knowledge (Harrison & Leitch, 2005; Wang & Chugh, 2014).

One reason for the missing consensus is the historic focus on two different recipients, entrepreneur and students, encompassing research on organizational learning and educational learning (Harrison & Leitch, 2005; Wang & Chugh, 2014). Within the latter, the experiential learning theory by Kolb (2014) has been highly influential and incorporated into many entrepreneurship university programs (Dhliwayo, 2008; Wang & Chugh, 2014). The key tenet of experiential learning is that entrepreneurs accumulate knowledge through experience, and thus, learn by doing (Kolb, 2014). Subsequent research has focused on understanding the transformation of practical experience to learning (Neck & Greene, 2011; Politis, 2005; Preedy,

2018; Wang & Chugh, 2014) highlighting the role of active participation and passive observation (Cope & Watts, 2000; Deakins & Freel, 1998; Rae, 2000, 2005; Rae & Carswell, 2001) as well as retrospective reflection (Binks, Starkey, & Mahon, 2006; Cope, 2011; Deakins & Freel, 1998; Pittaway & Cope, 2007; Taylor & Thorpe, 2004). Despite major advances in the understanding of experiential learning, it has also been criticized for its view of the learning process as isolated and innate (Fenwick, 2001).

Social learning theories fill this gap by highlighting the role of social interactions in the learning process (Cope, 2005; Jones & Iredale, 2010; Pittaway & Cope, 2007; Rae & Carswell, 2001). Social learning theories have been applied to study how social capital and co-participation influences entrepreneurial learning. For social capital, research provided evidence that an increase both in the size and quality of the network facilitates entrepreneurial through the support of scarce resources such as capital, knowledge, venture support or general advice (Cope, Jack, & Rose, 2007; Greve & Salaff, 2003). For co-participation, various studies have found empirical evidence that entrepreneurs often learn from others (“peers learning”) with a superior understanding of entrepreneurship or superior entrepreneurial abilities (Astin, 1999; Cope, 2005; Hamilton, 2011; Taylor & Thorpe, 2004; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996).

## 2.2 From individual to collective learning

Although experiential and social learning theory have contributed to our understanding of the entrepreneurial learning process, a major limitation is the focus on learning of the individual entrepreneur. Since recent research has emphasized the role of teams in starting, growing and leading new ventures to success, research has focused to describe and understand the underlying organizational learning processes (Astin, 1999; Binks et al., 2006; Lechler, 2001; Löbler, 2006; Pittaway & Thorpe, 2012; Taylor & Thorpe, 2004; Teal & Hofer, 2003; Terenzini et al., 1996). Among organizational learning theories, the collective learning theory has been most influential (Capello, 1999; Lazaric & Lorenz, 1998; Wang & Chugh, 2014). Capello (1999, p.354) defines collective learning as “a social process of cumulative knowledge, based on a set of shared rules and procedures which allow individuals to coordinate their actions in search for problem solutions”. Seel (2012, p. 647) state that the collective is enhanced through synergies in three ways: “(a) it achieves the capacity to restructure and to meet changing conditions; (b) it can add

and use skills, knowledge, and behaviors; and (c) it becomes highly sophisticated in its capability to deal with feedback and reflect on its actions”. Both Döös and Wilhelmson (2011) and Dixon (2017) stress that these synergies are not generated through plain dialogue, but through interactions with a wide ranging question-and-answer activity related to the topic at hand. However, reaching these synergies depends on an effective combination of “know-what”, “know-how” and “know-who” knowledge (Wang & Chugh, 2014) that can be achieved through face-to-face interactions (Kleinsmann & Valkenburg, 2005) or internet and communication technology (e.g. email or telephone call) (Sense, 2005).

To date, three studies have tried to explain how the three types of knowledge in small and medium-sized enterprises (“SME”) can efficiently be combined to create the synergies of collective learning (Gibb, 1997; Jones, Macpherson, & Thorpe, 2010; Sawang, Parker, & Hine, 2016). In a literature review on the effectiveness of SME trainings’ in the UK, Gibb (1997) emphasized that standardization was the reason for the reported missing effectiveness. Instead of the training, Gibb (1997, p. 21) argued that “SMEs needed to learn from and with their banker, their accountant, their customers and their supplier” to achieve lower transactions costs between the involved organizations. Hence, Gibb (1997) emphasized the importance of “know-who” for collective learning within the entrepreneurial network.

The second study focused on the role of the CEO for collective learning. Jones et al. (2010, p. 652, 654) report that the CEO’s “willingness and ability to create systems, procedures and relationships that encourage reflexivity will have a direct impact on organizational learning” and “the owner-manager’s human capital (education, experience, social skills and motivation) will directly influence the firm’s ability to engage in collaborative learning”. Furthermore, Jones et al. (2010, p. 657) discovered that “internal (bonding) social capital will directly influence knowledge sharing and organizational learning.” All three elements discovered in Jones et al. (2010) underline that the success of learning is dependent on social capital and internal bonding. Both were facilitated by the CEO, underlining the importance of exchanging knowledge within the organization and hence, the relevance for “know-how”.

The third study evaluated governmental business advisory programs in Australia, showing that collective learning in combination with tailored programs led to higher organizational learning of critical skills and capabilities (Sawang et al., 2016). In this case, collective learning was quantitatively operationalized as knowledge sharing, sharing similar needs among program participants, the level of learning from accelerator directors and the level of learning from other participants. Thus, this study emphasizes the importance of “know-what” and “know-how”.

## 2.3 Collective learning in start-ups

To date, no study has explored collective learning in start-ups. Start-up have been defined as “organizations established in an uncertain and volatile environment with the intent to bring a new opportunity to the marketplace” (Radojevich-Kelley & Hoffman, 2012, p. 54). Although start-ups have been classified as source of “creative distraction” due to higher innovative capabilities than older companies (Criscuolo, Nicolaou, & Salter, 2012; Shane, 2001), 70% of the start-ups close down, are sold to other companies or fail to see return on investment in the first five years (Battistella, Toni, & Pessot, 2017). Explanations for start-ups’ failure have been attributed to the product/service, industry, the market, the financials, the strategy and the founder team in the past (Battistella et al., 2017). Conversely, explanations for start-ups’ success have been linked to their integration into the ecosystem and the use of networks (Battistella et al., 2017; Chell & Baines, 2000; Chesbrough & Brunswicker, 2014; Eftekhari & Bogers, 2015; Rothschild & Darr, 2005; Waguespack & Fleming, 2008; West & Bogers, 2013). Together, the reasons for start-ups’ failure and success highlight the high learning challenge start-ups face, which can be mastered through high level of learning support focused on collective learning (Sardana & Scott- Kemmis, 2010).

Accelerators as “learning-oriented, fixed-length programs that provide cohorts of ventures with mentoring and education” are a new early-support program for start-ups offering the high level of learning support (Cohen et al., 2017, p. 6). Miller and Bound (2011) outlined the commonly adopted scientific definition of accelerators describing five main features typical for an accelerator. The respective elements compromise an (i) open application process that is highly competitive, (ii) pre-seed investment in exchange for equity, (iii) a team focus rather than individuals, (iv) a time limited support with a predetermined set of events and learnings and (v) the cohort approach with batches of start-ups. In comparison to other early-stage support models like incubators and business angels (“BA”), accelerators differ through eight criteria: the duration, cohorts, the business model, selection frequency, venture stage, venture location, the education and mentoring (Table 1) (Bergek & Norrman, 2008; Cohen, Bingham, & Hallen, 2017; Kuk & Davies, 2011; Landström, 2017; Spinuzzi, 2012).

Table 1 Differences between accelerators, incubators and business angels

Criteria	Accelerator	Incubator	Business angel
<b>Duration</b>	3 months	1-5 years	Ongoing (~ 7 years)
<b>Cohorts</b>	Yes	No	No
<b>Business model</b>	Investment or non-profit	Rent or non-profit	Investment
<b>Selection frequency</b>	Competitive, cyclical	Non competitive	Competitive, ongoing
<b>Venture stage</b>	Early	Early or late	Early
<b>Venture location</b>	On-site (usually)	On-site	Off-site
<b>Education offered</b>	Seminars	Ad hoc, HR / legal	None
<b>Mentorship</b>	Intense, by self & others	Minimal, tactical	As needed, depended on investor type

Adapted from Cohen et al. (2017) and extended with Landström (2017)

While BAs and incubators provide long-term participation, ranging from one to several years, accelerators provide an only limited duration of their programs (3-6 months). Moreover, only accelerators structure their programs in a modular system, accepting a limited amount of ventures as a cohort and nurturing them over the defined period. Business models differ between accelerators and incubators. Accelerators are mostly privately owned and take an equity share in the participating ventures while incubators are often publicly owned. Incubators are led by managers and normally do not invest in the companies but finance themselves through rent and other fees (Bruneel, Ratinho, Clarysse, & Groen, 2012). Business angels are single individuals, who invest their own money in the selected ventures (Cohen et al., 2017). While accelerators are major providers of educational elements and mentoring activities, incubators have only a limited responsibility to educate their tenants and focus more on access to different kinds of resources (Bøllingtoft, 2012; Bruneel et al., 2012). The key feature of the education is the authenticity that helps accelerators to develop entrepreneurial competencies and self-awareness by exploiting several possibilities like seminars, cohort peers, divided teams or mentorship (Cohen, 2013; Cohen et al., 2017; Miles et al., 2017; Salamzadeh & Markovic, 2017). Incubators, on the other hand, provide only selected educational elements on-demand, covering human resources (“HR”) or legal aspects despite evidence that frequent counseling interactions with the incubator manager increase the transfer of social capital (Bøllingtoft & Ulhøi, 2005; Patton & Marlow, 2011; Scillitoe & Chakrabarti, 2010). General mentorship is

only covered to a low extent. BAs normally provide no education during their investments but include mentorship elements when needed. It is important to stress, that this may vary between the four types of BA investors (Cohen et al., 2017; Landström, 2017). In conclusion, accelerators' emphasis on educational elements in combination with mentoring activities highlights the learning process start-ups' go through in accelerators. This process can be characterized as collective as it is inherently social (mentoring, batches), builds on the knowledge of the teams (cohort peers), has a set of shared rules and procedures (limited support, seed investment) and coordinates start-ups' actions in search for problem solutions (coaching and mentoring).

## 2.4 Research question and theoretical relevance

Subsequent research has explored how this new model of assistance impacts start-ups through different theoretical lenses (Battistella et al., 2017; Cohen, 2013; Cohen et al., 2017). In the most prominent study, Cohen (2013) investigated how accelerators accelerated learning. Using a qualitative approach, Cohen (2013) found that accelerators helped to increase the learning speed through four interactions, comprising mentor overload, director experts, divided teams and cohort peers. While the mentors as external advisors delay implementation ("expand strategic options"), the accelerator directors transfer accumulated expertise to the entrepreneurs ("narrow strategic options"). Teams accelerate learning due to fact that they split up during experience accumulation and cohort peers facilitate learning as helpers or rivals (Cohen, 2013). These findings are important as they contrast the collective learning literature stressing the importance of tailoring to create collective learning and subsequent ventures' success (Jusoh, Ziyae, Asimiran, & Kadir, 2011; Sawang et al., 2016).

Thus, we propose collective learning theory as theoretical lens to study start-ups in accelerators. We focus on coaching, mentoring and Demo Day as previous research has provided evidence for the social and collective nature and they comprise the three key value proposition of accelerators (Wise & Valliere, 2014). First, for the coaching, Liljenstrand and Nebeker (2008) found empirical evidence that entrepreneurs together with mid-level managers are most frequently coached compared to other individuals, uncovering the importance of coaching for this target group. Furthermore, Liljenstrand and Nebeker (2008) discovered that based on the interaction, the coach's educational background is most often associated with the position of



the coachee. In their literature review on coaching activities, Blackman, Moscardo, and Gray (2016) concluded that a positive relationship between coaches and coachees had a positive effect on training outcomes. In that area, two themes emerged: First, the necessity to find a good match between coachee and the coach, even though there is only limited knowledge about how to find a good match. Second, the interviewed coachees believe that they achieve better learning outcomes when the coach developed a personalized or tailored program for them (Blackman, 2010; Du Toit & Reissner, 2012; Gregory & Levy, 2011; Orenstein, 2006; Wasylshyn, Gronsky, & Haas, 2006).

Second, the role of mentors has been defined as being responsible for a broad and holistic development, comprising six general outcomes: behavioral, attitudinal, health-related, interpersonal, motivational and career outcomes (Eby, Allen, Evans, Ng, & Dubois, 2008). Lankau and Scandura (2002) discovered that learning outcomes can be achieved in two ways: On the one hand, protégés could work together with their mentors and learn from the collaboration and discussions with them. On the other hand, they could observe their mentors and strengthen their skills through imitation. Research has also investigated the role of the intervention style (St-Jean et al., 2017), the match between mentors' and mentees' learning orientation (Godshalk & Sosik, 2003), the personality of the entrepreneur (Memon, Rozan, Ismail, Uddin, & Daud, 2015), entrepreneurs' decision-making (Memon et al., 2015), the start-ups' phase (Memon et al., 2015), the cultural background and the context (Purcell & Scheyvens, 2015) for the effectiveness of mentoring. Within the accelerator literature, Brodie, van Saane, and Osowska (2017) explored what mentors know and Cohen et al. (2017) explored how mentors help start-ups learn. Brodie et al. (2017) stated that mentors increase the business knowledge, provide guidance and help prioritizing goals, as well as increase the confidence and offer access to relevant networks ("know-what"). Cohen (2013) and Cohen et al. (2017) found that mentor overload, time compressed interactions with external advisors that delay implementation ("expand strategic options") did not only help but accelerated learning ("know-how").

Last, the Demo Day is a valuable element at the end of the program, designed to connect start-ups of the current batch with a high-quality group of investors and customers to secure investment and public support. During this event, start-ups often pitch in front of the audience and participate in networking events afterwards (Pauwels, Clarysse, Wright, & van Hove, 2016). Research on BA investment criteria discovered that presentational factors tend to have

an substantial impact on how a presentation is perceived by investors as well as how much interest for an investment was aroused (Mason & Harrison, 2003; Parhankangas & Ehrlich, 2014). These findings indicate that pursuable investment opportunities are not solely assessed on investment related information or traditional human capital factors (Haines Jr, Madill, & Riding, 2003; Hall & Hofer, 1993; Mason & Stark, 2004). In fact, Clark (2008) and Drake (2014) identified a variety of important variables that impact how the presentation is perceived by investors. For instance, the clarity of the concept, the overall understandability of the business model or the structure applied. Research has also emphasized the importance of the right recipient (Polzin, Sanders, & Stavlöt, 2018). The authors stress that in the current matchmaking process between entrepreneurs and investors, significant misalignments of perceptions exist. Moreover, the authors suggest that tailored approaches are necessary to address the right investors. For the accelerator literature, (Battistella et al., 2017; Clarysse & Yusubova, 2014) stressed that one of the major advantages of an accelerator are the networking events, especially during the Demo Day, which provide a matchmaking process between the start-ups and potential investors in the pool. Further in-depth insights are lacking, as research has not yet discovered how collective learning supports the start-ups in discovering tailored investment approaches for specific investors through the accelerator director.

To sum it up, no research has applied collective learning as theoretical lens to study start-ups' learning process in accelerators. Since collective learning depends on the efficient combination of "know-what", "know-how" and "know-who", we aim to answer two questions:

1. Do start-ups perceive that coaching, mentoring and Demo Day are efficient ways to acquire knowledge about the three domains, "know-what", "know-how" and "know-who" through collective learning?
2. If so, what does this perception rely on?

Understanding how accelerators help start-ups learn collectively is important as various researchers have proposed that accelerators are efficient and beneficial for start-ups' success (Cohen et al., 2017; Gonzalez-Uribe & Leatherbee, 2017; Yu, 2016).

## 3 Methodology

The study seeks to understand collective learning of start-ups in accelerators and its determinants. The epistemological basis of the study is social constructionism since we try to understand individuals' perceptions about the social interaction in accelerators. As literature on collective learning processes for “know-what”, “know-how” and “know-who” of start-ups in accelerators does not exist, an exploratory and inductive study is valid (Yin, 2009). Traditionally, researchers have utilized an explanatory approach to present a general understanding of the subject, which can be gradually used to gain a better understanding of the overall context (Wallén, 1996). To analyze our data, we use interpretative phenomenological analysis (“IPA”) (Smith, J. A., Flowers, P., & Larkin, M., 2009). Our unit of analysis was “collective learning”. Interpretative phenomenological analysis aims is to study participants perception and their sense-making of the world while (Pistrang & Barker, 2012; Smith & Flowers, 2009).

### 3.1 Research design

To arrive at a “thick description” of collective learning in accelerators, we used a multiple case study approach (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). The main source for the construction of our case studies were interviews and archival data (e.g. accelerators' website, industry reports, newspaper articles) reinforcing the need of a qualitative method (Bryman & Bell, 2015). Although, the use longitudinal to study learning processes has been emphasized in the literature (McMullen & Dimov, 2013), the design of the study was cross-sectional, given time constraints. To explore how accelerators achieve collective learning and how these measures are perceived by start-ups, we compared the operations of five accelerator programs in two steps: First, we interviewed the program managers of the accelerators with a semi-structured interview guide to explore how they operate. Second, we reviewed these learnings by interviewing nine alumni start-ups from prior batches in these accelerators, using a corresponding semi-structured interview guide.

## 3.2 Sample selection

For the sampling of accelerators, we adapted the selection criteria for accelerators defined by Miller and Bound's (2011). The selection criteria for the interview partners were as follows: (i) A possible offer of an upfront investment, ranging between 10,000 and 50,000 Euro, regularly in exchange for an equity stake of five to ten percent; (ii) limited-duration and support during the time of the program, comprising both planned events and through mentoring; (iii) an open application process, which is highly competitive but in general open to all; (iv) a limited number of start-ups (often called cohorts) that start at the same time, rather than individual companies; (v) preferring small teams than individuals and (vi) terminating the program with a periodic graduation, often called demo or investor day. These criteria have been used in prior studies (Christiansen, 2009; Cohen et al., 2017; Pauwels et al., 2016).

To identify accelerators in a first step, our search for accelerators was based on three sources utilized by other researchers over the last years (Battistella et al., 2017; Lall, Bowles, & Baird, 2013; Smith & Hannigan, 2015): (i) Crunchbase, a platform that gathers data from companies, people, investors and funding, (ii) Seed-DB, an online database of prominent accelerators around the world and their graduated companies and (iii) fs6.com, an online-community platform that connects founders with accelerators, funding institutions and other potential investors. Using the three sources, we identified 579 accelerator programs.

Out of the 579 accelerators, 61 matched at least five of the six the sampling criteria. The possible offer of equity was less important as a sample criterion in this case because it did not influence the coaching, mentoring or Demo Day. We used a short mail (Appendix A) to arouse interest and build an initial relationship. The benefit of this approach was to create a high-quality set of interview partners early on, because we anticipated the slow responses (1-6 weeks) due to the full schedule of our interview partners.

In total, we received twelve responses of accelerators that were willing to participate and we mailed a detailed outline (Appendix B) to the accelerators that were interested. Using purposive sampling for this dataset, we further imposed three additional criteria that resulted in a final selection of five cases (Neergaard & Ulhøi, 2007). First, we selected accelerators with a proven track record (e.g. generated funding or exits) or appear to stay in the field for a longer time (at least 3 batches). Second, to improve recall, the potential interview partner had to have worked

for the accelerator for at least one year and had to have been highly involved with the operations. This step was important to make sure that the interviewee could share first-hand experiences as the research design relied on the perception of the interviewees. Last, the accelerator was located in Europe and we ranked our possible interview partners according to the Regional Entrepreneurship and Development Index (REDI), resulting in 80% of our cases within the Top 20 (Szerb, Acs, Autio, Ortega-Argiles, & Komlosi, 2013). Since research has shown that accelerators have a specific geographical focus of operation (Pauwels et al., 2016), the last criterion enabled us to select locations with a strong entrepreneurial environment. With the narrow criteria, we aimed to select a homogenous group of experts on the field to maximize the insights in the exploratory phase of our study (Neergaard & Ulhøi, 2007).

Subsequently, further communication through email and a non-recorded pre-interview of approximately 30 minutes were used to validate the sampling criteria, create case files, extend the relationship and to schedule in-depth interviews.

*Table 2 Anonymized interview partner – Accelerator perspective*

<b>Criteria</b>	<b>Accelerator A</b>	<b>Accelerator B</b>	<b>Accelerator C</b>	<b>Accelerator D</b>	<b>Accelerator E</b>
<b>Equity</b>	€30k for 5%	No equity	No equity	€20k for 6%	€15k for 8%
<b>Support</b>	Provision of both coaching/workshops and mentoring				
<b>Application</b>	Generally open to all, sometimes with specific batch themes				
<b>Cohorts</b>	8-10 start-ups	Yes, but number varies	10 start-ups	10 start-ups	25 start-ups
<b>Team focus</b>	Yes				
<b>Demo Day</b>	Yes				
<b>Track record</b>	2011	2015	2012	2011	2015
<b>Interview partner</b>	~ 5 years	~ 4 years	~ 1 year	~ 2 years	~ 1 year
<b>REDI index no.</b>	80	1	20	15	15

Extended from Miller & Bound (2011) and filled with archival data from accelerators

After the selection of the accelerators, start-ups were contacted. Traditionally, some researchers have used start-ups in an active batch for interviews about the accelerator experience (Battistella

et al., 2017; Cohen et al., 2017). The main disadvantage of this approach is that interviewees sometimes have not finished the program, did not find the time to think about the experience retrospectively or simply are not far enough in their venture progress to apply the learnings from the accelerator.

We aimed to have two start-ups from each accelerator to triangulate and generalize the findings (Yin, 2009). To achieve this step, we created a comprehensive overview of the alumni start-ups from the accelerators' website. Besides general and contact information, we also gathered financial information about funding rounds and amount through Crunchbase, to select start-ups with and without follow-up funding. We contacted an initial sample of 139 start-ups (Appendix C).

Purposive sampling was also used for the start-up sample, this time to sample a representative set of start-ups that mirrored all of the accelerator supported companies. While purposive sampling was used to create a homogenous group of accelerators in the first sample, this time it should guarantee a heterogeneous set of interview partners (Bryman & Bell, 2015; Sawang et al., 2016). This step was necessary to reflect a variety of start-ups, considering that collective learning can take place through different combinations of resources.

We imposed the following sampling criteria: (i) select at least two start-ups from each accelerator to get a second opinion, (ii) select both companies with and without follow-up funding after the Demo Day and (iii) the start-ups have finished the program or at least the formal part of the program, as some accelerators provide some office-space even after the Demo Day. While the last criteria enabled us to get reflective feedback on the accelerator participation, it also yields one limitation. Retrospective asking through interviews only covers one moment in time. Considering that learning is an ongoing process with varying outcomes during different points in time, retrospective questions can be biased (Seet, Jones, Oppelaar, & Corral de Zubielqui, 2018).

In the end, we selected nine start-ups as interview partners. All of them operated within the technology industry but focused on different areas, such as advertisement, education or software. Furthermore, four start-ups participated without the aim to get funding, three aimed at funding and were successful, and the remaining two tried to get funding through the accelerator and failed. Furthermore, seven of them finished the program entirely, and the remaining two start-ups finished the formal part of the accelerator.

Table 3 Anonymized interview partner – Start-up alumni perspective

<b>Start-ups</b>	<b>Accelerator</b>	<b>Joined in</b>	<b>Industry of operations</b>	<b>Planned to get follow-up funding</b>	<b>Follow-up Funding</b>
<b>Start-up 1</b>	Accelerator A	2016	Advertisement	No	No
<b>Start-up 2</b>	Accelerator A	2015	Software	No	No
<b>Start-up 3</b>	Accelerator A	2013	Care-Platform	Yes	No
<b>Start-up 4</b>	Accelerator B	2014	Medical	Yes	Yes
<b>Start-up 5</b>	Accelerator C	2017	Education	No	No
<b>Start-up 6</b>	Accelerator D	2016	Cloud-Software	Yes	Yes
<b>Start-up 7</b>	Accelerator D	2016	Application	No	No
<b>Start-up 8</b>	Accelerator E	2017	Software (AI)	Yes	No
<b>Start-up 9</b>	Accelerator E	2017	3D Modeling	Yes	Yes

Based on archival data and interview transcripts

In total, we selected 14 interview partners, comprising five accelerators and nine start-ups to have a reliable data set, which both allows a contribution to research and lays within the typical set for qualitative studies (Tesch, 1994). For accelerators B and C, we were only able to conduct one interview with a start-up each due to time constraints.

### 3.3 Data collection

During March and April 2018, we conducted the semi-structured in-depth interview with the program manager of accelerator programs and start-up founders & CEOs. Overall, the interviews were conducted in similar phrasings, although the semi-structured guide allowed the interviewer to follow-up on specific statements from the interviewees. The respective guidelines are attached in the Appendix D and E. The guidelines also enabled an in-depth analysis of certain topics and made a steady flow of the interview possible (Bryman & Bell, 2015).

Interviews ranged from 40 to 70 minutes and always involved two researchers: While one conducted the interview in the English language, the other took field notes. All interviews were

conducted through Skype video sessions. The importance of these face-to-face or video interviews lay within the ability of the interviewer for further observations of social cues, as for instance changes within body language or voice (Bryman & Bell, 2015; Opdenakker, 2006). Following the procedures introduced by Miles and Huberman (1994), each interview was audio-recorded and interview data was thereafter transcribed. This process resulted in 188 pages of total interview transcripts.

### 3.4 Data analysis

To analyze the data, the transcripts were coded using NVIVO as it has been recommended as a way to structure and analyze transcripts for increased transparency and methodological rigor (Neergaard & Ulhøi, 2007; Saunders, Lewis, Thornhill, & Wilson, 2009). Even though this method is primarily used when pursuing a grounded theory approach, it is still the starting point for most forms of qualitative analysis (Bryman & Bell, 2015). As we used interpretative phenomenological association to analyze the data, we developed a systematic analysis plan to deal with the rich and extensive transcripts (Cope, 2011). The analysis plan followed three steps: (i) initial read-through of the unmarked transcript, (ii) second go-through with identification of large themes and (iii) final go-through with detailed coding of respective passages in the transcript. By pursuing this approach, we focused on answering the research question, already creating categories, sections and an overall structure. To avoid biased analyses or perceptions based on only one single data analyst, both researchers analyzed and coded the transcripts independently before comparing the results and discussing an overall outline for the results (Bryman & Bell, 2015).



## 4 Results

In this chapter, the data collected from the transcribed and coded interviews is presented. The structure is derived from the key value proposition of accelerators and the interview guidelines, using coaching , mentoring and Demo Day as single sections (Wise & Valliere, 2014). For each of the three sections, the findings are presented in two steps (Table 4). First, we describe the general themes. Second, we explain how these themes are related to collective learning focusing on “know-what”, “know-how” and “know-who”.

*Table 4 Key findings by classification and frequency*

<b>ID</b>	<b>Variable</b>	<b>Classification</b>	<b>Collective learning</b>	<b>Relevant Nodes</b>
1	Selection	Coaching	How	11
2	Tailoring	Coaching	What	11
3	Mentor pool	Mentoring	How & What	41
4	Mentor matchmaking	Mentoring	How & What	20
5	Mentor interactions	Mentoring	How & What	43
6	Importance of Demo Day	Demo Day	Who	32
7	Investor matchmaking	Demo Day	Who	41

Data filled based on transcripts and coding analysis.

## 4.1 Coaching

### 4.1.1 Selection process and subsequent peer generation

#### **Application process, selection and matchmaking**

All nine interviewed start-ups expressed different expectations that were the drivers for their application to the accelerator programs. While some of the alumni articulated concrete expectations about what they needed to learn in the program, others just wanted to take part in the new kind of support system because they had heard about the accelerator in their entrepreneurial ecosystem. For the ones that expressed precise expectations, two major themes were apparent: Five start-ups reported that they needed support in the product development (e.g. hypothesis testing and targeting customers) and four start-ups stressed they needed guidance on business development (e.g. how to start a company).

From an accelerator perspective, all five program managers reported that apart from venture related characteristics, including the business model, target market and venture stage, the team was one of the major selection points. The importance of the team is twofold: First, it is a prerequisite for good internal team dynamics so that that start-ups could work well together. Second, strong teams were also valued for their participation in peer sessions with the other teams from the batch. From a start-up perspective, start-up 9 also stressed that the right combination of start-ups was crucial:

*“We didn't get in, because they already had, you know, kind of 3D modeling company, it wouldn't be good if you had the similar things with each other, I think the managers were curating the choices, after making some deliberate choices on how they are going to mix together. It was part of the formula to get the right mix.”*

#### **Peer learning & community**

After generating the optimal set of individuals and teams in one batch, peer learning was mentioned as one of the key resources of learning, both from the accelerator (B and D) and start-up perspective (4, 6, 7 and 9). Start-up 4 emphasized that in a normal business environment, founders get in touch with all different kinds of people, including “stupid, mediocre and smart” people. In an accelerator, founders surround themselves with an unusual

density of smart and capable people to learn and get advice from. Start-up 7 described the peer learning sessions and emphasized its importance as follows:

*We also had group sessions where we talked to each other with the start-up companies and we discussed these problems. (...) And then, I have to admit, one of the most viable things for me, is with the other start-ups. I don't underestimate that that is actually one of the best advice, because you know, they are there for a reason, these guys are all kind of smart, international, and the general atmosphere is, to help each other out and not supposed to compete with each other.*

### **Extracurricular events to create more interactions**

Accelerators B, C and E also emphasized the use of extra-curricular activities during the program. The goals of these activities differed between accelerators. Accelerator B and E had them to mingle for the start-ups, while accelerator D also used it as informal recruitment events for the start-ups that were searching for staff. Furthermore, three accelerators (A, B and C) highlighted their role of creating an ecosystem (or platform) that would allow the start-ups to thrive. In this ecosystem, they want to facilitate the contact making between the individuals to exchange knowledge and information. Accelerator B described the aim of this knowledge exchange:

*So, we work to create a whole of the ecosystem. To be a facilitator in the ecosystem between the competencies and the possibilities within.*

#### **4.1.2 Tailoring & on-demand support**

##### **Initial start-up assessment and tailored support**

While the first coaching element stresses the importance of the batch and its fit, the second emphasizes the coaching element, including the importance of tailoring and on-demand support. Two of the accelerators (D and E) implemented a short validation phase at the beginning of the program that included meetings between the program director and the individual start-ups to identify start-ups' most pressuring needs. During this tailored kick-off, the directors tried to identify critical steps to get the start-ups to the next level and incorporated those additional learning contents for the start-ups individually.

Although the majority of accelerators indicated that their programs were mandatory, several start-ups highlighted the importance of tailoring workshops. For instance, start-up 6 stressed that:

*The workshops are like pretty long and pretty generic. Which is not so useful. What's more useful is sessions you have with like the 1-1 coaches, so they have many, many coaches which you can pick from, you can come by and talk to them and have sessions with them, they all have their specialty. And that was very good.*

From a start-up perspective, the interviewees stressed two aspects that made tailored workshops necessary. First, three start-ups (2, 3 and 6) reported that they perceived the content as less valuable when it was not directly matched to their current venture status, even though it might have been an interesting workshop in general. Start-up 2 mentioned in this case:

*There were workshops, I was like 'O.k. that is not for my start-up', but it's good and interesting, but I'm not going to use it within the next few months.*

Second, start-up 3 and 4 also stated that the workshops were perceived less valuable when the content was low-quality. In those cases, the start-ups did not learn new contents because they needed more advanced coaching from experts to gain new insights. For instance, start-up 3 stressed:

*There were some sessions in SEO, led by the employees which was really, really low quality, they weren't prepared that we were more advanced, it was like for high-school.*

### **Continuous on-demand support during accelerator journey**

Furthermore, accelerator B, D and E mentioned on-demand support for special issues that were not covered in the program and that were important to overcome to accelerate the start-ups. With this measure, adjustments for potential differences in the progress of individual companies can be identified and additional learnings incorporated. These issues can be everything from missing expertise in the mentor pool to an introductory meeting with large corporations. Accelerator E summarized the support as follows:

*Besides that, if they need something focusing on marketing or competencies on human resources ("HR") and building the organization, we can either*

*find competencies that have that, otherwise we fix bilateral meetings with people from that world*

### 4.1.3 Collective learning in coaching and its determinants

Collective learning plays a key role in the coaching activities of the accelerator, both in the peer selection process and for the tailoring activities. From an accelerator perspective, the selection was focused on creating a well-tailored batch that could improve collective learning through peer learning in a group. This type of learning comprised mainly the exchange of knowledge and discussion between start-ups within the batch. Through a collective learning lens, the start-ups learned how to solve problems based on the experiences and advice from their colleagues. This type of learning outcome can be categorized as “know-how”. The second major finding within the coaching activities is tailoring. The importance was stressed both from start-ups and accelerators. Tailoring the contents based on the current needs of the start-ups should increase the learnings. From a collective learning perspective, the tailoring can be seen as an efficient combination of “know-what” and “know-who”. At first, the program manager identifies learning needs through a social interaction with the start-ups and then establishes a knowledge exchange with specialists. For instance, when accelerator B identified a missing competency in marketing or HR, the manager brought the start-up together with a specialist.

## 4.2 Mentoring

### 4.2.1 Mentor pool & selection process

As for the engagement of mentors, accelerators reported that they all had a pool of mentors, ranging between 50 and 150 mentors. At the beginning of the program, this pool was contacted to determine who could invest the required amount of time. Accelerators reported participation rates between 50% - 70%. Apart from the mentor pool, accelerators also highlighted the role of the ecosystem in accessing a network of experts. These people could not participate as mentors for different reasons but offered to help out on specific occasions or problems.

Overall, mentor play a key role in the accelerator and a two-step process was employed to select mentors. All program directors reported that they did not have hard criteria for selecting mentors but relied on soft criteria. In general, accelerators searched for mentors with a certain

level of expertise, which could manifest in several years of work experience or the successful launch of a start-up. Mentors could be from academia, entrepreneurs or the corporate environment. For example, accelerator A indicated that they wanted people with fifteen years of experience that had achieved a certain position of power. Accelerators used different ways to attract and select mentors. For instance, mentors were gathered through the personal network of the program manager as well as the accelerator founders. Furthermore, accelerators were approached by individuals who wanted to join as mentors or received referrals from already participating members. Sometimes program managers conducted an online search through LinkedIn and other networks to approach suitable mentors.

Before individuals were accepted to the mentor pool, accelerators conducted interviews with them. The interviews allowed them to inform future mentors on the form and level of expected engagement. The level of expected engagement differed between accelerators with every accelerator expecting a time commitment of 1-3 hours a week. (accelerator B: 1-4 hours per month, accelerator D: 16 hours per month, accelerator E: 4-12 hours per month).

From a start-up perspective, four interviewees (1, 3, 4 and 6) stressed the importance of a mentor pool whose background matched to the batches' respective industry. This step would increase the probability to match with mentors that have the necessary experience and also could make introductions into their own network. Furthermore, two start-ups (1 and 4) reported that accelerator with a narrow industry focus (e.g. food or advertisement accelerator) would be more successful in maintaining a highly- focused mentor-pool. Start-up 1 mentioned:

*There are also accelerators that are focusing on advertising, so probably there we would be having a more, let's say tailored experience with mentoring. So, that could lead to more.*

#### 4.2.2 Mentor match-making

After building and maintaining a well-matched mentor pool, the mentor matching was the second important element to facilitate collective learning. Accelerators reported different matching approaches ranging from formal meetings to informal mingles. Accelerator B took the most formal approach by setting up an advisory board with multiple mentors after consulting with the start-ups. Conversely, accelerator A and D organized days where all start-ups would meet all mentors in one to one meetings for half an hour to talk about. Accelerator C had a more informal event where all mentors and start-ups would present themselves in a pitch followed by an informal mingling session. Accelerator A on the other hand, chose an informal approach and proposed mentors to start-ups based on their needs and a perceived match.

Besides the formal match-making, four start-ups (2, 4, 6 and 8) stressed the importance of a good match between mentor and start-up to learn from the mentorship. The match should be made based on experience and knowledge of the mentor in the same market as the start-up is operating in. Start-up 4 mentioned the importance of the experience:

*That would be really beneficial, if you could have a mentor who [had] previous experience in the area the company is doing, that's pretty beneficial and some other companies had more beneficial mentors than us, because they had mentors who were closer in terms of experience of what they were doing*

Furthermore, the same start-up stressed that they struggled to find a mentor with the same market background:

*The problem we had was, we were the only health-life science, call it medtec, the only company that's doing that, and no mentor in the program was experienced in that area, so we kind of got really, really limited help in terms of the specialty needs*

Apart from market knowledge and experience, both accelerators and start-ups stressed that a good chemistry is crucial to match with the right individual. When start-ups had a good chemistry with their mentor, they felt like they could “*build up this personal relationship with this mentor*” (start-up 6) and subsequently learn from the knowledge of those individuals. It also implied that accelerator director have to tailor the mentor pool every year based on the investment focus of the batch to guarantee a perfect mentor and start-up fit.

### 4.2.3 Interaction with mentors

Start-ups reported differences in the frequency and forms of mentor sessions. The interaction between start-ups and mentors ranged from e-mail exchanges to two-hour long mentor sessions. They could also be informal during a lunch or in a more formal setting with a pre-scheduled meeting. The frequency of those consultations differed considerably. Some start-ups had regularly scheduled meeting with their (1, 2 and 3) while others met their mentors on-demand (4, 5, 6, 7, 8 and 9). For the latter group, the start-ups noticed that most of the time they had to proactively set the meetings. As for the number of mentors, start-ups frequently utilized more than one mentor and contacted different mentors with individual level of expertise for different problems (6 and 7).

As for the structure of the meetings, start-ups 6, 7 and 9 highlighted that they attended the meetings having concrete problems. Furthermore, start-ups (2, 4, 6, 8 and 9) reported that learnings from mentor interactions were primarily driven by the applicability of the feedback. This means that mentors enabled the start-ups to understand problems, function as a sounding board or derive short-term milestones to achieve certain goals. Start-up 6 stated:

*But sometimes, they thought about how to test certain hypothesis or basically think in a different way that, if there is an issue. If we could go around it only the right side, they would say, did you try the left one? (...) We want to look at a data point, but we don't really know how to get these points and they would know how to analyze our current data to do that.*

In total, three main learning variables could be derived from the interactions with mentors, when the mentor had matching industry expertise. These learnings can be classified into two groups, personal and relational-job learnings (Lankau & Scandura, 2002). A learning was classified as personal if the learning was independent of the start-up and could be transferred to other start-ups or businesses (Lankau & Scandura, 2002). Conversely, a learning was classified as relational-job if the learning was tied to a start-up or a market and could not easily be transferred to another start-up or business (Lankau & Scandura, 2002). The variables were ranked based on the number of start-ups that stressed their importance during the interviews. The number of relevant nodes gives an indication of how often the topic was discussed during the interviews.



*Table 5 Learning variables from alumni perspective by ranking and frequency*

<b>Rank</b>	<b>Variable</b>	<b>Classification</b>	<b>Number of start-ups</b>	<b>Relevant nodes</b>
<b>1</b>	Business development	Relational-job learning	7	16
<b>2</b>	Product development	Relational-job learning	3	16
<b>3</b>	Planning & Prioritizing & Milestones	Personal learning	2	6

Data filled based on transcripts and coding analysis

Business development was the most discussed learning, as seven start-ups mentioned it 16 times. Because of the broadness of the topic, we differentiated between two sub-segments in the interviews: customer related topics and the value proposition. Five start-ups (2, 3, 4, 6 and 7) elaborated on the importance of the customer segment and that they learned to identify their core customer segment. Furthermore, they learned to tailor their value proposition on the specific types of customer personas and communicate it accordingly. Two start-ups (1 and 9) reported that the identification and refinement of the value proposition was one of the key learnings they took from the s program.

Product development ranked as the second learning variable. While only three start-ups mentioned it as a key learning, they referred to it 16 times in total. In the interviews, start-up 1 underlined the importance of hypothesis testing for the product development to create something that is needed by the target customer. In line with this emphasis, start-up 7 mentioned that they learned to develop the product by applying problem interviews, solution interviews, “The Mom Test” (Fitzpatrick, 2014) and to formulate an hypothesis before developing the product.

Planning, prioritizing and milestone setting as the third variable was mentioned by two start-ups but its importance was stressed six times. Start-up 1 said that well-considered milestones from the accelerator were important to have validation points during the journey and to focus on the main responsibilities during the venture process. Start-up 9 stressed that this element was the most important learning in the whole accelerator program by stating:

*We developed that in the program with them. So that was really good, that was kind of very practical outcome of these discussions was a plan in the next*

*six months. That was the most important thing to do, again, establish a lot of short time milestones, really try to achieve them.*

#### 4.2.4 Collective learning in mentoring

Accelerators put significant work into finding and selecting mentors to enhance collective learning. However, the outcome of this match-making differed between accelerators. While some accelerator looked for very specific mentors for the batch to effectively match start-ups with mentors others just used the pool they had. From the perspective of the start-ups, the most effective combination was based on the market knowledge and on the personal relationship with the mentor. The latter highlights the importance of the relational aspect in collective learning. When the match between mentors and start-ups was given, mentors could give start-ups relevant feedback about “know-what” (business & product development) and “know-how” (prioritize).

### 4.3 Demo Day

#### 4.3.1 Importance of the Demo Day

The majority of the accelerators (B, C and D) reported the Demo Day to be an important element for the internal structure of the program, providing a milestone that start-ups can work towards to and described the goal as a mix between celebration and completion of the program. In regards of the event itself and the target audience, two themes became apparent. Most of the accelerators (B, C, D and E) organize the Demo Day as a closed event with invitation-only access. Only accelerator A organizes a paid event open to the public but with limited tickets. Furthermore, accelerator D stressed that the purpose of the Demo Day changed over time. The original aim of accelerator D’s Demo Day was to gain traction with investors at one single event when there were only a few accelerators. However Accelerator D, stated that the number of accelerators, start-ups and Demo Days increased significantly rendering the original purpose worthless. Nevertheless, all accelerator reported that the Demo Day should be an event where the start-ups interact with the public to generate public interest. The target audience at these events were investors (mentioned by all accelerators), mentors (A, B and D) and partners (B, C and E).

While the structure of the Demo Day varied in detail between the accelerators, the general agenda was identical in all five accelerators. The Demo Days started with start-ups' pitches and segued into a networking event. During the networking element start-ups either had booths to have discussions with interested individuals at their stands (B and D) or a more informal way of networking (A, C and E).

From a start-up perspective, all nine interviewees reported varying aims for the Demo Day. Six start-ups (1, 3, 4, 6, 8, and 9) mentioned media traction as a goal for the final day, while five (2, 4, 6, 8 and 9) also stressed the possibility to get in touch with partners. Interestingly, only four start-ups (3, 4, 8 and 9) mentioned funding as the ultimate goal for the Demo Day, even though start-up 8 stated:

*It would be better if we could find an investor who gave us enough money, but you have to be realistic about that. It never happens!*

#### 4.3.2 Investor match-making

Accelerators stressed that the Demo Day was not that successful in generating funding for the start-ups, because it was hard to get investors coming to these events or the setting changed over time (B, C, D and E). Accelerator E stressed:

*Lot of these start-ups also have these pre-misunderstandings, that Demo Day is the day where they get investment, and they get investors. Which is usually not the case, Demo Days are usually successful for accelerator program, because it's a nice PR event, everyone is talking about them, they send the press releases, the pictures, but very little comes out for the start-ups.*

All five accelerators reported that they supported the start-ups in finding an investor. This match-making was facilitated by different methods like circulating the pitch deck in the whole investor network, actively reaching out for specific investors or partners, the introduction of start-ups to investors and last by setting-up meetings between both parties.

Furthermore, accelerator A ("investor week") and D ("repetitive investor nights") reported to establish constant or longer interactions with investors that enable investors to get a deeper understanding of the start-up and their progress. Besides, start-ups also received information from program managers about the investors in the accelerator network. Along with the

information, start-ups learned how to target the right investor for negotiations and also how to talk to specific investor (A, B and C). Also, accelerators support the start-ups with general investor related workshops on how to do due diligence or negotiate or provide feedback on the slide deck before contacting the investors (A and B).

#### 4.3.3 Collective learning during the Demo Day

As accelerators reported that the Demo Day seldom leads to investment, start-ups perceived little value for the Demo Day. Start-up presented themselves during the pitch and got in touch with potential investors and customers during the follow-up networking events. However, the social interactions did not lead to any significant learnings, considering that the start-ups had prepared extensively prior to the Demo Day. Instead, start-ups reported that collective learning took place during various investment trainings and match-making activities between start-ups and investors throughout the programs. The focus of these events was to bring the right individuals together (“know-who”) and to know how to address the specific needs of investors (“know-how”).

# 5 Discussion

The key themes of the interviews have been presented and related to collective learning in the data analysis. This chapter discusses the results with the respective theoretical background in mind, linking the discovered themes to the existing entrepreneurial and collective learning literature and also identifying new themes for future research.

## 5.1 Research aims and objectives

The aim of this study was to explore startup's perception of collective learning in accelerators. Collective learning expands entrepreneurial learning by extending the individual learning approach and defines learning as a social process with the involvement of various stakeholders. The effective combination of "know-what", "know-how" and "know-who" as a requirement for collective learning has been stressed in the literature. However, it has not been understood how an effective combination can be created. Due to the exploratory nature, the purpose of this study was to investigate whether start-ups perceived that coaching, mentoring and the Demo Day were efficient ways to acquire knowledge about "know-what", "know-how" and "know-who" through collective learning and what this perception relied on.

## 5.2 Summary and discussion of the results

### **Coaching**

In terms of coaching, the right selection of start-ups for the batch was stressed to optimize peer learning. Program managers should check for synergies and a fit within the cohort when they select the start-ups. These results reflect various studies in the collective learning literature, as empirical evidence exists that entrepreneurs often learn from others (Cope, 2005; Du Toit & Reissner, 2012; Hamilton, 2011; Taylor & Thorpe, 2004). Furthermore, the findings stress the synergies of a well-balanced batch support the general requirement in the literature that

entrepreneurs in a peer group should have a comparable level of skills (Fischer & Reuber, 2003; Kutzhanova, Lyons, & Lichtenstein, 2009). This result is related to Jones et al. (2010, p. 652), who underlined the importance of the CEO “to create systems, procedures and relationships that encourage organizational learning.” For accelerators, program directors fulfill these CEO tasks by creating a batch with varying human capital in terms of education and experience. Moreover, they facilitate the relationships within it and provide them with the necessary educational content. Last, the findings support Blackman et al. (2016) and Liljenstrand and Nebeker (2008) who explored that a good match between a coachee and the coach is necessary, also based on a similar educational background to facilitate learning.

The second important finding was that start-ups perceived tailoring of the learning curriculum to the individual start-up and the batch to be crucial for collective learning. At the beginning and over the duration of the program, the program director has to check for needs that are not covered in the rigid learning curriculum of the accelerator and facilitate those necessary learnings. The finding contrasts earlier findings of Cohen (2013) who emphasized that the rigid structure of the program is important. Cohen (2013) argues that the structure determines what the start-ups have to learn, when they need to learn it and also how much time they spend learning about every aspect of the business. One possible explanation for this might be that the findings do not demand a completely flexible and tailored structure, but only additional elements that are tailored to the start-ups in the batch. This discovery is consistent with collective learning research in the coaching field, as coachee believe that they achieve better learning outcomes when the coach developed a personalized or tailored program for them (Blackman, 2010; Gregory & Levy, 2011; Orenstein, 2006; Wasylyshyn et al., 2006). Moreover, SME research reports similar findings, as collective learning in combination with tailored programs was able to achieve higher organizational learning in terms of critical skills and capabilities (Sawang et al., 2016). The authors emphasized that sharing of business know-how and sharing a similar learning need among the participants led to the learning. This matches with the findings in this study, as the importance of the right batch was reported by a number of interviewees.

## **Mentoring**

In line with previous literature on the importance of networks and social capital for nascent entrepreneurs (Cope et al., 2007; Greve & Salaff, 2003), mentors were important contributors to start-ups' collective learning. A good match between mentors and start-ups was stressed as a prerequisite for collective learning. Start-ups reported that their matching criteria were deep industry knowledge and personal chemistry with the latter highlighting the relational aspect in collective learning. However, the relation with previous research on the effectiveness on mentoring remains unclear. For example, Purcell and Scheyvens (2015) reported that the culture and context affected mentoring's effectiveness. In our sample, we did not control for the interviewees culture. Nevertheless, these findings are important because they extend how entrepreneurs' knowledge and personality traits influence the match (Stam, 2015).

Moreover, these findings stress the importance of two things: (i) accelerators need to adjust their mentor pool with regards to the industry of the admitted start-ups and founders' personality and (ii) should provide match-making events. While perceptions of personal chemistry are hard to assess when adjusting the mentor pool (Cull, 2006), deep market knowledge could be easier to assess for accelerators. In fact, when searching and selecting mentors, all accelerators reported that an executive or entrepreneurship role in a comparable industry was the first selection criteria. For finding mentors, it might be beneficial to distinguish between industry and function expertise, as it has been considered in studies on opportunity recognition (Gabrielsson & Politis, 2012).

For the match-making process, accelerators in the study differed substantially in the way they matched mentors with start-ups. While some accelerators used the existing mentor pool, others engaged in searching and selecting of specific mentors that matched with start-ups. Based on the findings, no conclusions about the effectiveness of those approaches can be drawn. For instance, it is challenging to measure whether accelerators have a sufficient mentor pool or not. However, for the matching process itself, Cohen (2013) suggests that accelerators can help start-ups by organizing formal match making meetings with potentially concurring mentors. Overall, all start-ups reported that they had access to the right mentors and achieved collective learning as a result. The findings match to Brodie (2017), Cohen (2013) and Cohen et al. (2017), as learning outcomes reported by the start-ups were related to business development ("know-what"), product development ("know-what") and planning & prioritizing ("know-how").

Similar to St. Jean et al. (2017), start-ups also perceived the mentoring as high value if it was non-directive.

## **Demo Day**

The study discovered that the Demo Day provides a formal end to the accelerator program and often combines various learnings in this one event. According to the interviewed accelerators and start-ups, the importance of the Demo Day shifted from an investment event to a celebration and PR event. This setting requires from both actors to find new ways of customer acquisition or funding generation. We did not anticipate this finding for two reasons:

First, the current accelerator literature describes the Demo Day as an important event that give start-ups the chance to raise external funding (Bernthal, 2017; Fehder & Hochberg, 2014; Tasic, Montoro-Sánchez, & Cano, 2015). Based on our findings, this is a misconception as accelerators and start-ups equally stressed the social character of the Demo Day. No investment was acquired during the Demo Day or directly after the Demo Day, instead start-ups used the Demo Day to interact with the audience. Usually, start-ups are required to pitch in front of everyone and participate in networking events later on. Both elements are characterized by a high amount of social interactions with important stakeholder (Battistella et al., 2017; Clarysse & Yusubova, 2014). This can be considered as an important element for collective learning, because the exchange of knowledge and information within a network of different groups is essential (Gibb, 1997).

Second, the interviewees described the Demo Day more as a formal closing event and less as an investment opportunity. Nevertheless, the findings discovered a highly tailored target group which included investors, potential partners (e.g. municipalities) or customers (Gibb, 1997). This is interesting, because the accelerator still tries to tailor the target group for the Demo Day, even though the purpose of the event might have changed. From a collective learning perspective, these endeavors are beneficial for the start-ups, as a tailored group with investors, partners and customers provide a solid basis for learnings of “know-who”. Therefore, the accelerator enables the start-ups to learn through the network and social interactions (Seet et al., 2018). It also underlines the importance of those well-established networks that can support individuals with different scarce resources, comprising capital, knowledge, venture support or general advice (Cope et al., 2007; Greve & Salaff, 2003; Johannisson, 1988, 2017).



The second interesting discovery is that accelerators anticipated the Demo Day's limitation for raising investments by providing various stand-alone match-making activities between start-ups and investors throughout the program. The focus is not solely on bringing the right individuals together ("know-who") but also on how to address the specific needs of the investors ("know-how") (Seet et al., 2018). This finding is consistent with previous research that discovered the substantial impact of presentational factors on how a presentation is perceived by investors as well as how much interest for an investment was aroused (Clark, 2008; Drake, 2014; Mason & Harrison, 2003; Parhankangas & Ehrlich, 2014). Furthermore, the findings support that BAs not only assess pursuable investment opportunities based on investment related information or traditional human capital factors. They also take into consideration how the start-up evolved when they have the unique chance to meet them several times during the program (Haines Jr et al., 2003; Hall & Hofer, 1993; Mason & Stark, 2004). Last, the findings suggest that accelerators provide support through collective learning to balance the misalignment of perceptions between investor and start-ups (Polzin et al., 2018). Accelerators achieve this step through identifying the right investor at an early stage ("know-who") and support the start-ups to address the right needs in the presentation ("know-how").

### **Importance and practical implications**

This is the first study that introduces collective learning as theoretical lens to explore how start-ups learn in early-support accelerators. The findings presented above provide insights into the importance of coaching, mentoring and Demo Day activities for collective learning. Based on our results, several possible implications could be drawn for accelerator directors. To create an effective combination, the accelerator director has to focus on three aspects: First, collective learning requires accelerators to take into consideration the team. Second, coaching activities have to be tailored to the individual batch and need to constitute applicable educational content that provides new insights during peer learning sessions. Third, mentoring activities need to be highly targeted to the industry focus of the batch. While some accelerators craft their batches with a greater level of diversity, others have a very narrow investment focus. From the perspective of collective learning, the question is if tailoring the coaching and the mentoring becomes easier for accelerators with a narrow investment focus and similar start-ups. However, the generalizability of these findings is severely limited by the exploratory and inductive nature of our study combined with a small sample of accelerators and start-ups. Nevertheless, some practical implications can be mentioned for researchers that aspire to investigate accelerators.

In our study, lead times for accelerators were very long. On average, 6 weeks passed by between sending the first mails to the potential interview partners and finally conducting the interviews with them. Furthermore, accelerators reported that they were sought-after. Thus, relationship-building becomes important for researchers interested in accelerators.

### 5.3 Research limitations

This study has a number of limitations. First and foremost, we did not speak to the other actors in the accelerator ecosystem, the mentors and investors. When investigating the effect of mentoring and the Demo Day, this triangulation of interview partners is necessary to achieve a holistic understanding of the collective learning process. The missing triangulation holds also true for the interview partners from the start-ups. For our study, we solely relied on statements from the CEO and co-founder to investigate collective learning processes and its determinants and did not include other team members that participated in the accelerator. Apart from time constraints, a reason for the focus on CEOs and co-founders was their influence for enabling collective learning (Jones et al., 2010). Second, our sampled start-ups interviews were biased by a number of reasons. For the selection of start-ups, we had to rely on start-ups from different batches (years) due to low response rates. Thus, our insights might be outdated as accelerators might have changed their program or important insights might have been omitted due to response bias or recall limitation (Miller & Cardinal, L. B., Glick, W. H., 1997).

### 5.4 Future research

Understanding the importance of collective learning within an accelerator is a complex and reflective process, as it is dependent on the perception of the alumni start-ups that participated in the past. We have attempted to shed some light on the issue capitalizing on the existing literature and an analysis of nine start-ups that participated in European accelerators. Given the explorative nature of this study, the results are confined to the perception of the individuals that we have interviewed. Our study has developed several propositions on how collective learning is perceived by the respective start-ups. In order to provide an even stronger support for these discoveries, future empirical research should expand on the quantitative measures of collective

learning introduced by Sawang et al. (2016) to be able to test assumptions raised in this qualitative study.

In line with the general need for tailored coaching and mentoring from a start-up perspective, future studies on the current topic should also investigate whether an industry focus of accelerators plays an important role in providing tailoring. To develop a more detailed picture, the impact of a tailored mentor pool and coaching should be tested empirically by comparing accelerator programs that select batches with a very narrow focus (e.g. sole artificial intelligence focus) to a more generalized program (e.g. software companies).

Additionally, research should try to describe the matchmaking process between start-ups and investors. Contrary to previous findings, we found no effect of the Demo Day for start-up investments. Although accelerators tailored their audiences during the Demo Day towards start-ups by inviting relevant investors or customers include investors, we did not observe collective learning between start-ups and investors. Future research should rather focus on the matchmaking activities that accelerators organize during the program to describe if synergies predicted by collective learning theory develop.

## 6 Conclusion

The goal of the study was to explore how start-ups perceived collective learning in accelerators. Collective learning was defined as social process operationalized through a variety of learning aspects, for instance sharing business knowledge or sharing needs with other program participants. Earlier research had emphasized the effective combination of “know-what”, “know-how” and “know-who” as determinant for collective learning (Capello, 1999; Sawang et al., 2016). In a first step, we examined if start-ups perceived that coaching, mentoring and Demo Day were effective ways to acquire knowledge about the three domains, “know-what”, “know-how” and “know-who” through collective learning. In a second step, we explored what these perceptions relied on. Our results yielded different insights for the three elements:

For the coaching activities, startups reported that collective learning was mainly concentrated on understanding the interrelation between “know-what” and “know-how” through coaches and peers in the coaching sessions. Accelerators facilitated collective learning with batches of nascent entrepreneurs and a coaching structure that was carefully designed. With this set-up, the start-ups could use the peer sessions to collectively learn “what” obstacles they overcame and “how” they did it (Seet et al., 2018). During mentoring, two knowledge domains (“know-what” and “know-how”) were provided to start-ups. The determinant for an efficient combination from a start-up perspective was the market knowledge of mentors and the personal chemistry with mentors. For the Demo Day, startups did not report a learning effect for any of the three knowledge domains at all. Before the interviews, we considered Demo Days as match-making events (“know-who”). However throughout the interviews, accelerators and start-ups voiced that they did not perceive investor match-making as one of the primary goals of the Demo Day. Instead, accelerators reported that they provided various match-making activities between start-ups and investors throughout the program. We discovered that these activities were valuable prerequisites for finding the right contact (“know-who”) and knowing how to address these contacts (“know-how”) (Seet et al., 2018).

In general, this study contributes to the collective learning literature and identified mentoring as the most important part of collective learning as the mentors provided concrete learning for the business and product development, as well as goal-setting.

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# Appendix A

## Initial Email template used to contact accelerators

Dear «Contact»,

my name is Felix Kaysers. Together with my colleague Eike Eul, we are writing our master thesis about evaluating accelerators as part of our master thesis in Entrepreneurship & Innovation at Lund University in Sweden. As the topic is still quite new in research, we are focusing on success factors that improve start-up performance in accelerators. Therefore, we would like to get in touch with you. If you decide to participate in our master thesis, we would give you detailed feedback on your accelerator at the 1st of June. Please do not hesitate to contact us if you are interested or have further questions.

Best regards

Felix Kaysers & Eike Eul

# Appendix B

## Follow-up mail after first contact with accelerators

Dear «Contact»,

thank you so much for your reply. In short, participation would require 2h in total from you. These two hours would be split into two interviews (pre-interview: 30 mins.; interview: 1h – 1,5h). Additionally, we would need to know the names of the start-ups that previously participated in the accelerator.

Detailed information about the interviews: The first interview is a pre-interview (ca. 30 min.) in the next three weeks. Interviews can be done on Skype or in Person. In the pre-interview, we check the general set-up of your accelerator. The pre-interview is necessary because we have identified a gap between the scientific definition of accelerators and real-world accelerators.

Based on the pre-interview, we would then set up a second in-depth interview (ca. 1-1,5h) in a timely manner. In the in-depth interview we will focus to identify the success factors of your accelerator.

If you have any further questions, don't hesitate to contact us.

If you would like to participate, you can just reply to this mail and suggest an time for the pre-interview that suits your schedule!

Best

Felix Kaysers

# Appendix C

## Email template used to contact alumni start-ups

Dear «Contact»,

my name is Felix Kaysers. I am a student in Entrepreneurship and Innovation at Lund University, Sweden. Together with my classmate Eike Eul, we are currently writing our master thesis about the evaluation of accelerators.

Because you participated in XXX, we would like to interview you about your experience during the accelerator. Because the topic is still quite new in research, we are focusing on the coaching/mentoring and the Demo Day and the relationship with your start-ups performance. The goal of this research is to establish a causal link between the accelerators program and your experience.

The (phone or Skype) interview would take approximately one hour and we are pretty flexible within the next two weeks. If you are interested in helping us by participating in our master thesis, please get back to us until the 6<sup>th</sup> of April.

Looking forward talking to you and all the best.

Happy Easter,

Felix Kaysers

# Appendix D

## Interview guidelines Accelerator

### Files to request before interview

1. Program outline
2. List of mentors (with expertise or background)
3. Mentor requirements
4. Demo Day invitation / program outline

### I. Introduction

1. Data will be published anonymously, therefore no ranking between our interviewees
2. Solely interested in methods that have a positive or negative effect on the performance
3. Therefore, not only interested in the best-case story, but it would be also nice to understand things that didn't work out for you – no sales pitch

### II. Coaching / Workshops

- General outline of the program? Do you have a document that we could use?
- How tailored are the modules in your program to suit the start-ups in the batch?
- How do you help the teams to get started?
- How often do you meet the teams? Do you have a weekly schedule with predetermined elements in it?
- Do you use loops to refine elements based on their learnings?
- How many of your modules are mandatory and how many only optional?
- Who else do the start-ups have to ask questions and get advice?
- What is your level of involvement? Do you consult, help or even co-create? Whose?
- With the 'manager' they get assigned at the beginning of the program?
- Do you have dinners or other extracurricular activities? Soft-skills related.
- What elements are covered by external persons? Do you have contractors or partners? If so, what is their incentive?

### III. Mentors

- What type of mentors do you have? How many? And from what background?
- How do you select your mentors? What are the requirements? If you have a checklist, can you share it with us?

- What is the fluctuation-rate of your mentors? From your point of view, is this rate primarily driven by mentors leaving the program or you changing the mentors?
- What is the involvement of those mentors? What is the level expected? Can you tell us something about the variance between the involvements?
- Are start-ups tied to a mentor or can they use the pool? If so, can they do that all the time or only for specific events? Do the start-ups get to know every mentor at the beginning of the program?
- What are the incentives to be a mentor? Do you have non-monetary incentives?
- Can mentors take equity before the Demo Day?
- Do you have an alumni-network that is part of the accelerator?
- Who is responsible in this network?

#### IV. Demo Day

- How do you build and maintain the investor network? What is the VC / angel ratio?
- How do you prepare your start-ups for the Demo Day?
  - o Pitching practice?
  - o Develop pitching deck?
- How much information about the investors do you provide to the start-ups? Advise start-ups that might match to the investor based on technology or industry
- Do you help the start-ups to identify their best possible investors? If so, how?
- How well are you connected to the investors? Do you advise them as well with personal opinions on the start-ups?
- Scope of the event? What happens during Demo Day? Can you run us through a day?
- Who is invited? From where? How many attend? No-show ratio.
- Do you select investors or invite as many as possible? Do you tailor the investors to your batch?
- Are there any aspects of your Demo Day that differs from other accelerator's approach?
- What happens after the Demo Day? Do you take any measures to follow-up on the Demo Day?
- Do you help the start-ups to achieve a negotiation phase with the investors from the Demo Day?

- How important is the Demo Day for your accelerator? How successful in terms of funding? How many start-ups get funding? What is the average amount of money they receive?

# Appendix E

## Interview guidelines alumni

### I. Before the accelerator:

- How long had you been working on your idea when you applied for accelerators?
- When did you participate in the accelerator?
- What made you apply for accelerators? Did you apply for other accelerators?
- Why did you apply for this accelerator? What factors were key to your decision?
- Did you check the mentors before applying / deciding?
- Did you check the program before applying / deciding?
- Why did you decide to participate in this accelerator?
- How does «Accelerator name» compare to other accelerators?
- What were your expectations for the accelerator? What did you think you needed to learn beforehand?

### II. Coaching / Workshops

- What were key learnings from the coaching / workshops?
- Were the coaching session mandatory?
- Can you remember one workshop that was really helpful and one that didn't bring you any further? What do you think is the reasoning behind it?
- How was your attendance at the coaching sessions?
- Did you find the coachings valuable during the accelerator? What do you think now about the coaching session?
- Reflecting on the things said above, what would you improve? What did you miss?

### III. Mentoring

- What did you think you needed most help with at the start of the accelerator? Did that change? How?
- What were key learnings from the mentors?
- How did mentors help you?
- Do you think you had access to the right mentors? Did that change over the course of the program?

- How much time did you spent with the mentors? Was there enough time for consultation?
- Can you guide us through a mentor session? Were the sessions in person or a digital tool.
- How did you choose your mentor?
- What were you looking for in a mentor?
- How many mentors did you contact?
- How regular were you in contact with the mentors?
- Did you stay in touch with your mentors after the program?

#### IV. Demo Day

- How did you prepare for the Demo Day? Did you feel prepared for the Demo Day? What were your feelings surrounding the Demo Day?
- What was your aim for the Demo Day?
- Did you get any investment from investors that came to the Demo Day? (If yes, from how many and how much?)
- How many leads did you collect / did you make during Demo Day?
- How important / integral was the Demo Day for you?
- What learnings did you apply for the Demo Day? What did you learn during Demo Day?
- How did the mentor's feedback influence your Demo Day?
- What happened post Demo Day? How long took it to acquire funding?
- What kind of support was there after the end of the program?
- How much support did you get after Demo Day?
- How long did it take for the investment to come through?
- Was is it successful? Was is tough? Personally! How
- What challenges have not been solved after the accelerator?