NMBU Norwegian University
of Life Sciences

Master's Thesis 2022 30 ECTS
School of Economics and Business

Entrepreneurial Learning in a Virtual Accelerator Program for the Healthcare Industry: A Case Study of EIRAccelerator

Entreprenøriell læring i et virtuelt akseleratorprogram for helsenæringen: en casestudie av EIRAccelerator

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Acknowledgements

Abstract

Purpose - The primary objective of this master's thesis is to further develop the theory of what promotes entrepreneurial learning in accelerator programs. The purpose of this thesis is to investigate which mechanisms and processes promote entrepreneurial learning within the "EIRAccelerator" and to examine the impact a virtual accelerator program for the health industry has on entrepreneurial learning.

Design/methodology/approach – The literature related to digital health accelerators and entrepreneurial learning was reviewed. This thesis utilizes the entrepreneurial learning framework developed by Pittaway et al. (2011), as well as theories on related entrepreneurial learning mechanisms. An abductive case study with a longitudinal design was conducted on the "EIRAccelerator", an accelerator program offered by the Norwegian Smart Care Cluster for start-ups in the healthcare industry. This was in order to gain a more comprehensive understanding of how the virtual environment within an accelerator program and its program components affect a startup's learning experience. In-depth interviews with five pilot participants and a focus group discussion were conducted. During the research process, the researcher drew upon information gained from a needs assessment completed before the pilot accelerator program, as well as directly observing the "EIRAccelerator".

Findings – This thesis presents a revised conceptualization of entrepreneurial learning that promotes a broader understanding of the phenomenon. The derived framework outlines four key principles of entrepreneurial learning: hands-on action learning, motivation, constructive feedback, and team learning. Further exploration of these principles was conducted in relation to the facilitating conditions that promote entrepreneurial learning in accelerator programs. According to the study, an accelerator program that is designed to foster entrepreneurial learning requires networking opportunities, mentoring, a test lab tailored to each company's needs, securing funding, and structuring and professionalizing the business model. It shifts the focus to the importance of building motivation, providing networking opportunities, and comprehensively testing product innovations in collaboration with potential customers and industry professionals in a customized test lab. By integrating these components, entrepreneurs enhance self-efficacy and build their networks, which is essential to gaining insight into market needs and ensuring sales success by customizing products to customers' needs. A virtual format provides participants with flexibility, but cohort companies would have preferred to meet in person at the beginning of the program to enhance group dynamics.

Originality/value – This thesis is the first to study and link the literature on virtual accelerators, entrepreneurial learning and digital health start-ups. It contributes to the literature on entrepreneurial learning by clarifying both learning conditions and program components critical for achieving entrepreneurial learning.

Keywords Entrepreneurial learning, Entrepreneurship education, Entrepreneurship, Virtual Accelerators, Virtual teams, Accelerated learning, Digital health, Cohort peers, Start-ups

Paper type Case study

Sammendrag

Hensikt - Hensikten med denne masteroppgaven er å videreutvikle teori om hva som fremmer entreprenøriell læring i akseleratorprogrammer. Oppgavens formål er å undersøke hvilke mekanismer og prosesser som fremmer entreprenøriell læring innenfor «EIRAaccelerator» og å undersøke hvilken innvirkning et virtuelt akseleratorprogram for helsenæringen har på entreprenøriell læring.

Design/metode/tilnærming – Litteratur om digitale helseakseleratorer og entreprenøriell læring ble gjennomgått. Denne oppgaven benytter det entreprenørielle læringsrammeverket utviklet av Pittaway et al. (2011), samt teorier om relaterte entreprenørielle læringsmekanismer. En abduktiv casestudie med longitudinelt design ble gjennomført av «EIRAaccelerator», et akseleratorprogram som tilbys av Norwegian Smart Care Cluster for oppstartsbedrifter i helsesektoren. Studien ble utført for å oppnå en helhetlig forståelse av hvordan det virtuelle miljøet i et akseleratorprogram og dets programkomponenter påvirker deltakernes læringsopplevelser. Det ble gjennomført dybdeintervjuer med fem pilotdeltakere og en fokusgruppediskusjon. Under forskningsprosessen benyttet forskeren informasjon fra en behovsvurdering utført før pilotakseleratorprogrammet, samt direkte observasjoner av "EIRAaccelerator".

Resultater – Oppgaven presenterer en revidert konseptualisering av entreprenøriell læring som fremmer en bredere forståelse av fenomenet. Det avledede rammeverket skisserer fire nøkkelprinsipper for entreprenøriell læring: praktisk handlingslæring, motivasjon, konstruktive tilbakemeldinger og teamlæring. Ytterligere utforskning av disse prinsippene ble gjennomført for å avdekke tilretteleggende forhold som fremmer entreprenøriell læring i akseleratorprogrammer. Ifølge studien må et akseleratorprogram som er utviklet for å fremme entreprenøriell læring tilby nettverksmuligheter, veiledning, et testlaboratorium skreddersydd hver bedrifts behov, sikring av finansiering og strukturering og profesjonalisering av forretningsmodellen. Resultatene flytter fokus til viktigheten av å bygge motivasjon, tilby nettverksmuligheter og omfattende testing av produktinnovasjoner i samarbeid med potensielle kunder og bransjefolk i et tilpasset testlaboratorium. Ved å innlemme disse komponentene øker gründerne sin mestringstro og bygger nettverk, noe som er avgjørende for å få innsikt i markedsbehov og sikre salgssuksess ved å tilpasse produktene til kundenes behov. Et virtuelt format gir deltakerne fleksibilitet, men kohortbedriftene ville ha foretrukket å møtes personlig i begynnelsen av programmet for å forbedre gruppedynamikken.

Originalitet/verdi – Oppgaven er den første som studerer og kobler litteraturen om virtuelle akseleratorer, entreprenøriell læring og oppstartsbedrifter innen digital helseteknologi sammen. Den bidrar til litteraturen om entreprenøriell læring ved å klargjøre både læringsbetingelser og programkomponenter som er kritiske for å oppnå entreprenøriell læring.

Nøkkelord Entreprenøriell læring, Entreprenørskapsutdanning, Entreprenørskap, Virtuelle akseleratorer, Virtuelle team, Akselerert læring, Digital helse, Start-ups

Oppgavetype Kasusstudie

Contents

Table of Figures

Table of Tables

1 Introduction

The benefits of effective healthcare for all are evident. Still, one factor that threatens to derail the realization of healthcare for all is the rising cost of healthcare. This has become a sore statistic, especially in mature economies across the globe. That has resulted in a growing debate on suitable ways of reimagining healthcare to advance broad-based care. Vitally, the healthcare industry is dynamic, and the cost associated with uncertainties can be unnerving, especially for investors who would be keen to devise solutions to healthcare challenges (Champagne et al., 2019). That said, there are substantial upsides for those able to deliver solutions that create value, and at the same time, thrive within the uncertainty that characterizes the industry (Singhal et al., 2018). On this basis, the healthcare sector, much like other sectors within society, is looking to technology to develop solutions that can broaden care affordably and efficiently.

According to the World Health Organization (WHO), healthcare is a challenging but dynamic field. The most pressing challenges are maternal and child mortality, and the continued prevalence of both transmissible and chronic diseases. With the advent of technology and these perennial challenges, there is a need to bolster health systems across the globe to achieve universal health coverage (Novillo-Ortiz et al., 2018). These challenges are all spelled out in Sustainable Development Goal (SDG) #3, which aims to ensure that all individuals have the means to live healthy lives and achieve well-being regardless of age (United Nations, 2015).

Globally, public health administrators seek technologies developed by the private sector that can address the healthcare needs of aging and growing populations. Despite sustained efforts and continued innovations, health systems have consistently struggled to translate innovations into viable solutions for clinical practice (Kelley et al., 2020). WHO also shares this view and has asserted that a historical review of digital health initiatives has revealed most of them to be disjointed and ill-coordinated. The result is technology solutions, which though well intended, cannot be scaled up to offer any meaningful impact on the healthcare industry (WHO, 2021). Maximizing the value of the public-private partnerships of the sectors calls for the creation of innovative solutions by the private sector, stimulating the adoption of those solutions within clinical spaces and providing for the continual refinement of the tools (Shaw et al., 2018). To realize their potential, digital health initiatives ought to be part of a wider ecosystem driven by concrete strategies, which incorporate leadership, financial, and organizational resources.

There is a need to establish an environment that makes certain that emerging solutions are in line with the needs of public health systems. Such an environment is one way of ensuring that digital health start-ups develop sustainable business models (Hwang & Christensen, 2008). Consequently, there is a need for a framework in place that empowers start-ups within the health sector to develop innovative digital solutions, which then transition into health practices. Such a framework could be implemented through accelerators for health-focused start-ups. These accelerators could function as short-term incubators for start-ups to enable them to come up with cutting-edge innovative businesses through funding, coaching, network access, and mentorship. Considering that the inability to model digital health solutions into viable market-ready products stands out as one of the main impediments to the success of the digital health sector, the acquisition of entrepreneurial knowledge and guidance from the accelerators could be a viable approach for boosting the success of the start-ups (Sittig & Singh, 2010). According to Politis (2005), entrepreneurial learning is the continuous process that nurtures knowledge useful in starting and managing business ventures to ensure their success. The growing interest in entrepreneurship as an enabler of sustainable development acts as a catalyst for the growth of accelerator programs (Smith, 2018). Despite their growth and a growing body of research on their existence, there remains limited clarity on their nature, particularly how they offer value to entrepreneurs. Against this backdrop, the current study aims to determine what factors promote entrepreneurial learning in accelerator programs within the health industry.

1.1 Purpose of the Study and Problem Statement

Innovation within the healthcare industry has been highlighted as one of the most effective ways of fostering high-quality and affordable care. Within the health industry, innovation could be a novel idea; a service or product; or a pathway to care that offers clear benefits over existing methods. Within the health industry, there are several obstacles to effective innovation. The innovation process takes longer, is more expensive, and is complex. These factors have meant that the best bet for high-quality care is through innovations funded by the private sector. It is on this basis that the concepts of digital health start-ups, as well as health-focused angel investors and venture capitalists, have emerged.

Vitally, the emergence of start-ups and venture capitalists over the past two decades has resulted in the rise of accelerators as new players within the ecosystem of healthcare start-ups. Accelerators have emerged to streamline the process of moving from innovative health concepts to viable business models that can be executed successfully in the market, which has

traditionally been one of the major hindrances to the success of start-ups within the healthcare industry (Uhm et al., 2018). Accelerators enable start-ups to avoid the mistakes made by others, help them access funding, and help in hastening the growth process, thus increasing the chances of their survival. Crucially, considering that an understanding of the business side of innovations is obtained through entrepreneurial knowledge, the current study seeks to determine the factors that promote entrepreneurial learning in accelerator programs within the health industry. Furthermore, for the current study, the specific problem statement is determining the nature of entrepreneurial learning and the factors that promote it within the EIRAccelerator pilot program.

1.2 Digital Health – the New Age in Health Management

Digital health, or digital healthcare, is the confluence of healthcare and technology to provide personalized and effective treatments. Innovations include wearable or implanted sensors with wireless communication capabilities, or devices to receive information and software to process this information (Klonoff et al., 2019). Essentially, the common function of health technology is to provide an illustration, interpret data, offer decision support, and in some cases, trigger an unconscious action within the body using software. Klonoff et al. (2019) assert that the relevance of digital health is in the provision of four key processes within healthcare, including diagnosis, monitoring, treatment, and prevention of illnesses. To that effect, digital health technologies can be especially useful in accomplishing the first two processes, i.e., diagnosis and monitoring of illnesses. They can also support the other two processes by resulting in behavioral changes such as the adoption of a healthy lifestyle or fostering a healthy engagement with medication. Data obtained from investment, academic, and regulatory communities have pointed to the significant growth of digital health as a suitable way of addressing lifestyle and chronic diseases such as diabetes (Dunn et al., 2018; Belknap et al., 2013).

Moving forward, four critical trends promise to bring about significant developments in digital health, particularly in addressing chronic diseases. These include an increase in financial investment in the development of digital health technologies. The second trend is the acceleration of the uptake of novel ideas and technologies for digital health and streamlining regulation within the digital health industry. The final trend is increasing the utilization of real-world data collection techniques by leveraging mobile apps to bolster clinical research (Klonoff et al., 2019). The likelihood of success of digital health companies depends upon the level of

preparedness and efficiency of the solution. Furthermore, the more dependable the evidence behind a company's technology is, the smoother the transition from a start-up to a fully-fledged digital health company (Klonoff et al., 2019). Such a journey from inception to success requires finances and guidance. It has been seen that start-ups often have innovative ideas that cannot yet be implemented into health practices, due to the lack of the requisite data to illustrate the efficacy of the technology. On this basis, the concept of digital health accelerators came up, which provides start-ups with the requisite resources to develop both their competencies and products to increase their chances of succeeding in the marketplace.

1.3 Research Setting

This research work has been conducted as a case study that analyses entrepreneurial learning in a new accelerator program for the healthcare industry in Norway, named the "EIRAccelerator". Between August 2021 and May 2022, the accelerator program was run as a first-ever pilot with five participating start-up companies. The accelerator program has many innovative features. Firstly, the program has been entirely digital, with virtual lectures and group work. The digital design of the program was a necessity of the hour due to the COVID-19 pandemic and regulations restricting group meetings. Secondly, the program aims to be specifically designed for the health industry. The program had many activities, including booster boards, lab activities, one-on-one sessions with a dedicated mentor, seminars with group discussions, inspirational workshops with invited speakers, and presentations.

Applicants must meet several prerequisites in order to be considered for the program. The company must be an early-growth company in Norway that delivers solutions within digital health, welfare technology or medical technology with international ambitions. Moreover, the company must have at least a verified MVP on the market or have already launched the product. The team behind the start-up must comprise a minimum of two dedicated members. The accelerator has a sustainability focus. Therefore, the company must address one or more of the UN Sustainable Development Goals. Additionally, the company must be interested in fundraising for growth within the next 6 - 18 months.

Since the program runs exclusively digital, companies from all over Norway have participated in the program. Start-ups are required to attend an introductory session for needs assessment, to fill out a KTH mapping and to plan their lab activities before they are accepted into the program. The KTH Innovation Readiness Level framework includes six key areas of

innovation development. Each area is described with a detailed readiness level scale with clear definitions of criteria, benchmarks, and actions.
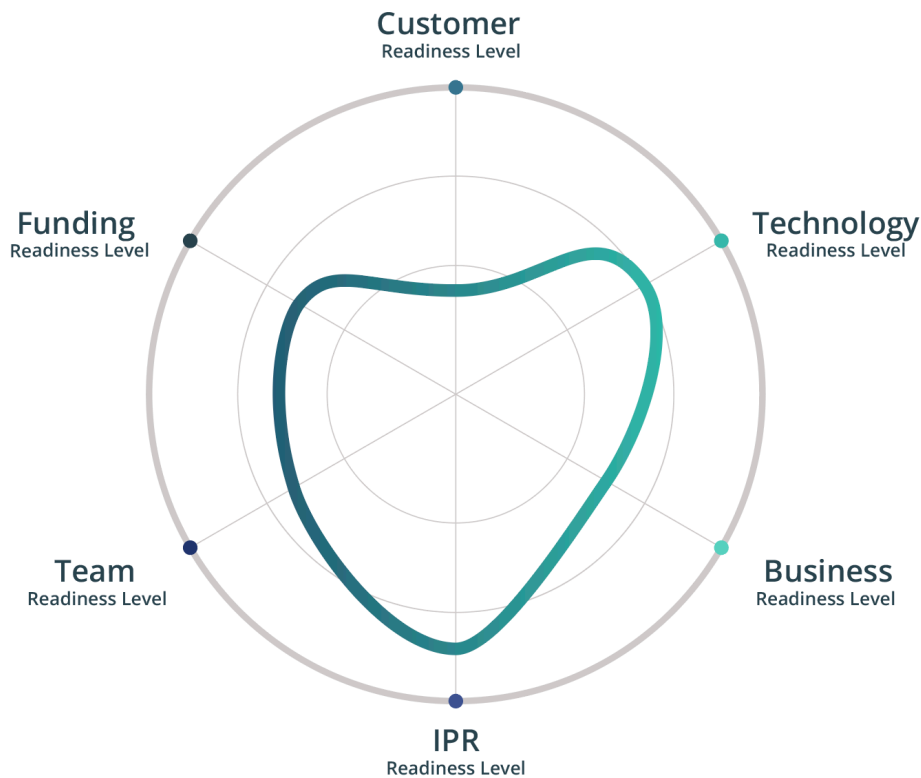
Figure 1: *Illustration of a finished KTH Innovation Readiness Level assessment*

The five case companies were invited to the program based on forming a group that would complement each other. Upon accepting an invitation to the program, participants agreed to several commitments. Instead of paying a program fee, they were obliged to contribute to the direction and development of the program and activities as co-creators. They were expected to follow up on homework and attend seminars. The estimated workload was set at a total of 200-250 hours. After the program, they would actively participate in a thorough evaluation process, and provide input for further development, including providing data for my master's thesis. Expectations were also set that the pilot companies should become committed participants in the accelerator program's alumni network after completion. The accelerator program places a strong emphasis on community building. The aim is to build a community that will continue to provide value after the program ends.

The program's raison d'être is to equip start-ups with vital knowledge and skills to propel them towards growth and scaling both nationally and internationally. To achieve this, the program has been designed to provide tailor-made and market-oriented value-creating

activities. The program aims to assist companies with industry-specific knowledge, tools and networks that will contribute to their growth and scaling up. The goals of participating in a cohort are learning, networking, and sharing experiences with other companies.
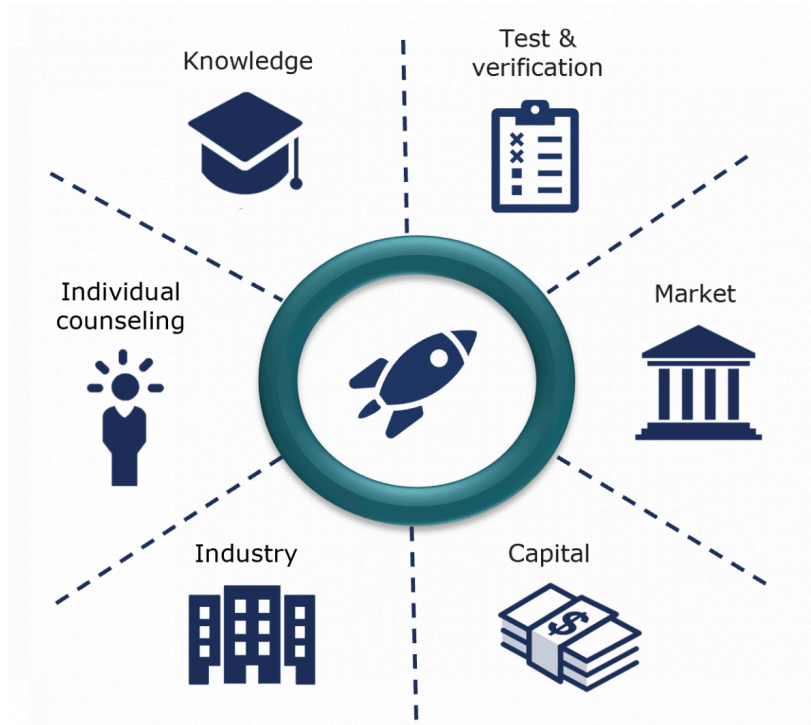
Figure 2: The six main pillars of the program (EIRAccelerator, 2022).
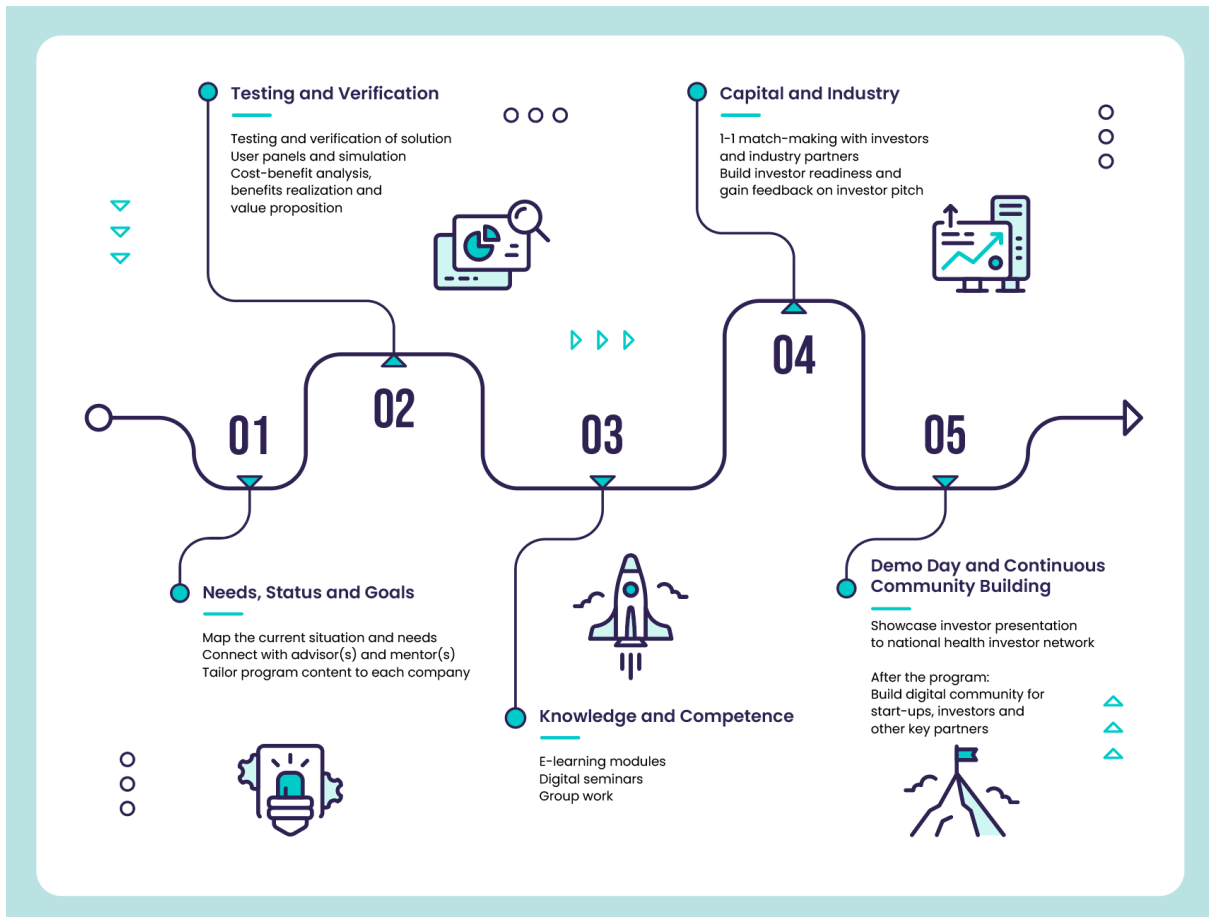
Figure 3: An illustration of the roadmap of the accelerator program in five phases.

In the first phase of the program, the company's current situation is mapped, along with its existing goals and strategies. Based on this assessment, specific goals are refined and highlighted for each company, and an individual plan of value-creating activities for the accelerator race is laid out. Each company is allocated one or more mentors and/or advisors who follow the company throughout all or part of the program.

The second part of the program is testing and verification. This is a unique and major part of the program, which takes place at the Norwegian Smart Care Lab (NSCL) through lab activities. Lab activities are tailored to the needs of start-up companies and address current challenges. In a lab environment, each company gets to test and simulate its solution. Subsequently, the solution is tested and verified in a real environment to evaluate market fit. This is called a functional test and is the stage where the solution is tested with real users (e.g., patients and healthcare professionals) to verify that the solution works as intended and meets their needs and requirements. Cost/benefit analyses are conducted, and benefits realization tools are taught in the lab. The companies are given advice on pricing and sales strategy, as the lab maps potential customers' willingness to pay (WTP). A regulatory micro-sprint is

conducted, where insight and knowledge of relevant regulatory requirements are in focus. An analysis is formed, which lays the groundwork for strategy formulation and the creation of a value proposition based on the results. The lab also helps with developing the company's IP strategy, e.g. in relation to internationalization.

In the third phase, companies are taught valuable knowledge and skills in key areas. This includes presentation techniques, growth and internationalization, business development, funding and finance, business and regulation, people and organization, business model, and market and customer. The companies are taught tools and strategies with which to complete group assignments together with the other cohort companies.

The fourth phase revolves around matching companies with investors and industry partners. Companies are taught how to screen investors, and what different types of investors are looking for in their investor pitches and presentations. In addition, companies are invited to virtual group talks with investors to get information on what they look for and how they operate. The cohort companies get advice on investor pitches from an expert in the field and are given tools to build investor readiness.

The final phase of the program is a demo day, where the companies showcase their polished investor presentation to a national health investor network and get feedback. After the program is finished, community building starts. The goal is to create a digital arena that continues to provide value to companies. This community will comprise a network of alumni companies, a forum for discussions and exchange of experiences, searchable experts with cutting-edge know-how and resources, and alumni events and matchmaking. The long-term goal is to build a Nordic community for digital health start-up companies.

The team behind the accelerator consists of the Business Development Manager, the Lab Manager, and the Project Manager. The Business Development Manager is the head of the accelerator, conducts the needs assessment, is one of the mentors, and follows the companies throughout the activities. The Lab Manager's main area of responsibility includes managing the testing and verification activities in the lab. The Project Manager has responsibilities both in the accelerator program and in the lab.

1.4 Research Contribution

Among the different functions of accelerators, of importance to the current study is how they bridge the entrepreneurial knowledge gap, thus making it possible for start-ups to navigate the journey of transitioning their inventions into sustainable business ventures. Despite

common knowledge that accelerators are integral in providing start-ups within the health sector with an avenue to transition into thriving ventures, little is detailed in the current literature on how different factors within such programs enhance entrepreneurial learning. Such an understanding is crucial, as it will make it possible to know which factors to harness to increase the level of entrepreneurial learning that the founders of start-ups pick up from the accelerators, to enhance their capacity to run their ventures effectively. From a broader perspective, there are three peculiarities about this work – sector, geography, and subject. It has been seen that little has been discussed about these three factors in a single study i.e., the current empirical evidence is very thin for Scandinavian virtual accelerator programs in the field of digital health.

The health industry is very different from other industries owing to the amount of capital that is required as an investment in R&D. So, the stakes are all the higher for these companies and thus these companies need to be managed in a different manner in comparison to start-ups in other industries. However, the basic approach is the same as in other sectors. Within the healthcare industry, as in other sectors, accelerators support early-stage entrepreneurs by providing four critical elements. The first is business development support, which encompasses consulting and technical assistance. The second is infrastructure support, such as access to office space and providing companies with avenues in which they can undertake pilot studies as a way of improving their inventions (Smith, 2018). A third key element that accelerators offer to start-ups is the much-needed network support comprising potential investors, customers, and mentors who can guide entrepreneurs on the most effective approaches.

Finally, accelerator programs help start-ups acquire financial support through grants and equity investments (Bone et al., 2019). The accelerator programs tend to be fixed-term, cohort-based programs that blend education, and provide mentorship and investments. Scandinavian start-up companies are doing well in sectors like financial services and entertainment. It's high time that the Scandinavian companies now make a mark in the global health start-up arena. In this research, the current state of the EIRAccelerator program in Norway will be analyzed. It will also try and lay out a set of recommendations from the outcomes of the study. These recommendations can then be used to define and layout other accelerator programs in the Nordic region. This study is intended to be a guide for health care entrepreneurs and policy makers in order to improve the overall start-up environment.

1.5 Structure of the Thesis

In this first chapter of the thesis, I have presented the purpose of the study, the problem statement and the research setting. To gain an understanding of the research setting, which is a digital accelerator program for the health industry, I have introduced the reader to digital health. I have elaborated on the research contribution of my thesis, where I have explained why the topic of entrepreneurial learning in a virtual accelerator program is of interest. Next, the theoretical framework for the thesis is outlined in chapter 2. In this chapter, I address the concept of entrepreneurial learning. I describe recent trends in digital health, explain why accelerator programs are pertinent to digital health and describe the entrepreneurial learning dimensions in the framework of Pittaway et al. (2011). In addition to presenting the entrepreneurial learning dimensions, I also examine them through the lens of six related entrepreneurial learning parameters. Throughout the discussion section, I refer to the framework of Pittaway et al. (2011) in addition to the advanced concepts I have presented in the elaboration. The choice of research design and data analysis methods is justified in chapter 3, and results are summarized in chapter 4. Empirical analysis and discussion, limitations, recommendations and implications are covered in chapter 5.

2 Literature Review

2.1 Recent Trends in Digital Health

Growth in the digital health sector can be evaluated by calculating the number of financial inputs directed towards digital health investments on an annual basis. According to a report by Rock Health, 2018 stands out as a record year for money invested in digital health, and that includes both venture capital funding and the number of deals that were successfully completed (Day & Zweig, 2019). As depicted in the figure below, in 2018, the amount of money invested in digital health start-ups was $8.1 billion. According to Dietsche (2018), companies within the health sector are keen on making health more accessible by increasing the quality of healthcare, and reducing the costs associated with new digital health technologies.
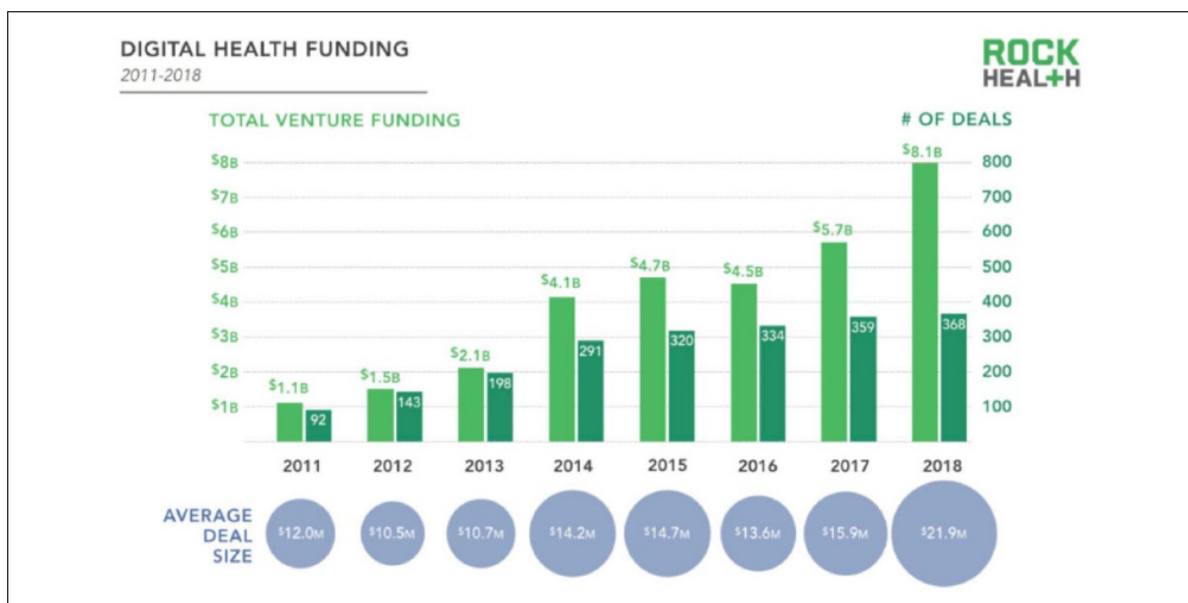
Table 1: The distribution of digital health funding from 2011 – 2018 (Day & Zweig, 2019)

Interestingly, despite the evident growth in investments in digital health, there is a belief that investing in digital health solutions is tricky. This is because investors need to consider multiple factors before investing. These factors include the quintessential but common attributes of a company, such as market, technology, and team.

There are additional factors specific to the healthcare sector, which inadvertently influence the start-up's success (Van Winkle et al., 2019). For instance, when the digital health

solution requires the use of specific electronic medical records, it is often the case that it will require significant involvement of IT teams from the respective institutions. Obtaining the required level of cooperation from stakeholders is often a tough ask. Furthermore, security requirements in relation to compliance with regulations such as Europe's General Data Protection Regulations (GDPR) must be observed. This increases the level of scrutiny on digital solutions, particularly on how they collect, analyze, manage, disseminate, and store patient data (Van Winkle et al., 2019). As a result, undertaking the pilot studies needed to boost the efficacy of digital solutions is often an arduous undertaking that is often time-consuming and expensive.

2.1.1 Digital Health Accelerators

The term health accelerator has emerged in the last decade as a natural consequence of the confluence of trends within the healthcare and technology sectors on digital health start-ups. Health accelerator programs are designed to help entrepreneurs speed up launching and growing their health technology companies by providing a combination of capital, guidance on suitable strategies, and business support (Suennen, 2014). After first appearing in the United States (US), specifically in San Francisco, and Chicago, health accelerators have expanded into other regions of the world, especially Europe. However, there has been scepticism among some in the industry, who question whether a model that originated in the world of technology can be adapted for the health industry (Apodoca, 2013). The reason for their scepticism is entrenched channels, long sales cycles, and a significant regulatory burden on the health sector. All of these are at odds with the volume-driven model that is synonymous with the world of technology start-ups, and accelerators. Even though there have been evident changes in the industry, which have broadened opportunities for healthcare companies, some factors still hinder the success of digital health start-ups.

Health accelerators emerged shortly after technology seed accelerators began disrupting the technology industry. In 2009, following the passage of the American Recovery and Reinvestment Act (ARRA), billions of dollars were made available for funding the adoption of information technology (IT) tools within the healthcare industry (Apodoca, 2013). Furthermore, in 2010, with the passing of the Affordable Care Act (ACA), there was a need to extend health coverage to an additional 30 million people. As a result of both ACA and ARRA, there was a marked surge in demand for health services and new technologies. With significant cash flow directed towards digital health as a possible way of expanding and enhancing the

healthcare industry, there was a clear opportunity for digital health accelerators to guide start-ups to navigate the process of developing a sustainable business.

With the healthcare industry lagging other sectors in terms of digitization, opportunities are ripe for leveraging technology to enhance healthcare for all. That said, companies and particularly start-ups involved in healthcare technology have traditionally received less attention from private equity investors than they would need to foster their success (Champagne et al., 2019). That has a lot to do with the complexity of healthcare tech, which makes it difficult for would-be investors to understand the business models of many health-tech start-ups, effectively limiting their ability to raise much-needed capital. Furthermore, most healthcare tech solutions have targeted unexplored markets, i.e., those not served by the existing healthcare framework, making them vulnerable to disruptive market forces, which dampen the interest of investors (Champagne et al., 2019). The suitability of accelerator programs for start-ups within the healthcare industry gains traction in such a scenario. The accelerators in the health industry, in much the same way as those in the technology industry, are formal programs focused on accelerating the process of launching business ventures (Uhm et al., 2018). The relevance of such programs has become evident, especially in healthcare tech, as they promise to expedite the entrepreneurial process of transitioning from a start-up to a fully-fledged business entity.

Digital health accelerators can be integral in making what would otherwise be an obscure technology start-up appeal to the relevant players within the healthcare industry. For instance, in a study involving the different health-specific accelerators in the US, the founder of Healthbox (one of the pioneer digital health accelerators), highlighted the progress start-ups could make. That is, soon after leaving the accelerator program, 90 per cent of the start-ups involved in the initial program had already begun generating revenue and secured new pilots to undertake additional studies for their products and new partnerships, to bolster their operations (Apodoca, 2013). Crucially, the benefits of accelerators for start-ups extend beyond finances and include visibility and publicity. Start-ups need to gain early visibility that they can leverage, and a pipeline of plausible opportunities they can take advantage of. In addition, accelerators strengthen the ecosystem for supporting early-stage health technology companies. For instance, the Angle Group initiative by Rock Health is focused on helping health professionals become angel investors (Apodoca, 2013). Accelerators serve as a suitable draw for founders with strong technical skills, and entrepreneurs who lack healthcare experience.

They provide them with education and an avenue for them to develop ideas into viable products.

Like incubators, accelerators assemble the elements of technology, capital, entrepreneurship expertise, and talent, intending to hasten the process of commercializing innovations, and as a result, the growth of a start-up. The main challenge that most healthcare tech start-ups have displayed is entrepreneurial ineptness, which results in an inability to come up with suitable business models, despite having inventions that could disrupt the marketplace (Hwang & Christensen, 2008). Consequently, there has been a growing emphasis on entrepreneurial learning as an effective way of bridging the gap between inventions and the marketplace. According to Politis (2005), entrepreneurial learning is the continual process that provides for the development of the requisite knowledge useful in starting and managing business ventures to ensure their success.

Health-specific accelerators have a significant role in helping start-ups in the health sector bridge the gap between ideas and transition them into viable business models. That has been highlighted by the success of accelerators such as the Texas Health Catalyst at the Dell Medical School, which in its role as an agile, low-cost, and high-impact accelerator, has managed to improve the value of digital healthcare. That is through better outcomes and lower costs from ideas that would otherwise have been lost owing to a lack of mentoring (Viswanathan & Gadgil, 2020). It is especially pertinent to develop suitable business models that are aligned with consumer preferences and market trends to ensure their success. In doing so, entrepreneurship education is an integral part of the mentoring role that accelerators play. That said, there is scanty information on how entrepreneurial learning occurs within the digital health accelerator programs and how the education serves to guide the start-ups in their quest to create fully functional business models, from ideas that would otherwise not develop into products that are suitable for the marketplace. As such, the current study is focused on determining how entrepreneurial learning takes place within digital accelerator programs in the health industry and how the learning affects the prospect of health start-ups in their bid to develop sustainable business models from their innovations.

2.2 Theoretical Framework

Learning is a pervasive phenomenon that transcends all human endeavors, and it entails emotional, cognitive, behavioral, and social elements. Furthermore, according to Passaro et al. (2017), learning is a situated activity that is regenerative and often builds upon the experiences

of the learner. Moreover, learning occurs both unconsciously and within the control of individuals, and it can occur on an individual level or in teams and organizations (Fust et al., 2018; El-Awad et al., 2017). That said, there are diverse forms of specific learning, and in the context of the current study, entrepreneurial learning is of particular importance. According to Gerring (2015), there is a tendency for the concept to lack clarity in both entrepreneurship research and the social sciences, particularly when it is viewed simply as the confluence between entrepreneurship and learning (Nogueira, 2019). One of the pivotal themes that emerge to comprehend the phenomenon of entrepreneurial learning is how entrepreneurs learn from failures. The theme is focused on instances in which entrepreneurs are faced with significant challenges that end up triggering transformative and regenerative learning.

In a study by Boso et al. (2019) aimed at determining the effects of business failure experience on the performance of new ventures the findings show that if channeled through entrepreneurial learning, a business failure tends to influence the performance of new ventures. That is within the context of increased alertness to available opportunities and increasing levels of entrepreneurial learning. Consequently, entrepreneurial learning stands out as being an experiential process in which an entrepreneur updates their stock of knowledge based on their previous experiences. Seeing that failure in previous businesses is a significant enabler of entrepreneurial learning, Wei et al. (2019) sought to determine the factors that promote entrepreneurial learning from failure. One of the factors pinpointed is the individual factors of an entrepreneur. According to Wei et al. (2019), from the personal perspective of the entrepreneur, entrepreneurial learning from failure is influenced by entrepreneurial failure, which would result in a positive impact on the performance of new enterprises.

Furthermore, critical career experience plays a crucial role in enhancing the development of the entrepreneur's attitude towards failure. This will enable the entrepreneur to be more alert to emerging business opportunities. In addition, self-leadership stands out as a significant factor in enabling entrepreneurs who have experienced failure to successfully recover. Some of the other factors that may determine the ability of an entrepreneur to learn from failure are enterprise factors, where for instance, the pressure from the financial cost of failure will determine what an entrepreneur learns from the failure of a venture (Cardon et al., 2011). That is particularly the case when a delayed business failure occurs, which tends to be financially costly, making it harder for the entrepreneur to rise from failure. On this premise, learning from the experiences of others stands out as a suitable way for new entrepreneurs to learn, without the significant financial costs that might result from learning from their failed

ventures (Wei et al., 2019). Researchers have found that entrepreneurs tend to gain knowledge by leveraging practical experience, intuition, and imagination on enterprise factors.

Vitally, based on an understanding of the factors that tend to enhance entrepreneurial learning, the idea of how the environment influences how entrepreneurs learn is of particular importance. That is especially so since, for start-ups within the health industry, the failure of enterprises is unlikely to be the most appropriate way for entrepreneurs to pick lessons they can use in bringing about the success of future ventures (Lattacher & Wdowiak, 2020). Such is the case since the industry tends to be risk-averse, considering what is at stake, both in people's lives and finances. As such, start-ups within the healthcare sector aim to ensure that they are successful from the onset, as it is unlikely that they will get many opportunities to redeem themselves. That brings up the idea of accelerator programs whose interest has grown as they are viewed as genuine enablers of sustainable development. Accelerator programs are developed to find, select, and support promising entrepreneurs and ensure that their innovative ideas are transitioned into sustainable businesses that positively affect society.

2.2.1 Entrepreneurial Learning

Entrepreneurship can be defined as the act of creating opportunities and responding to existing circumstances to create shared value for others (Cope, 2005; Lackéus et al., 2016). On account of the relevance of entrepreneurship to contemporary society, there has been a marked growth in interest in comprehending how to optimize an individual's capacities toward becoming a highly effective entrepreneur. Learning plays an integral part in developing entrepreneurial capability. It is considered a cognitive process for acquiring and structuring knowledge, creating meaning from experience, and bringing about novel solutions from existing knowledge. Learning by doing helps you gain confidence and expertise. Entrepreneurial learning is about how people learn new concepts and broaden their horizons for themselves. This is done while they identify and act on opportunities in the process of organizing and managing businesses. More than acquiring functional knowledge, it involves active execution. Pittaway & Cope (2007a) stated that entrepreneurial learning has become a central component of studies on entrepreneurship. Entrepreneurship itself is a continuous learning process (Cope, 2005).

Entrepreneurial learning is one of the most critical aspects of entrepreneurship, as it helps in acting and exploring opportunities based on existing conditions (Pittaway et al., 2011). However, there appears to be confusion regarding what the term entrepreneurial learning

entails. As highlighted by Nogueira (2019), the main reason for this confusion is that it is viewed simply as the confluence between entrepreneurship and learning. There is an exciting perspective that despite the high level of fragmentation and incongruence in the concept of entrepreneurial learning, there is a broad consensus that learning among entrepreneurs mainly entails transforming experiences into knowledge (Nogueira, 2019). That view is backed by Pittaway et al. (2011), who posits that entrepreneurial learning is the type of learning that takes place through experience in instances where one's actions are geared towards the creation of business ventures. Similarly, according to Rae (2005), entrepreneurial learning entails activities, experiences, and newness, which make it primarily a learn-as-you-go process that is linked to the creation of enterprises. The literature study undertaken by Pittaway et al. (2011) shows that there has not been much in-depth empirical research on the topic, despite the phenomenon's growing popularity (Edwards, 2001).

2.2.2 Higher-Level Learning
The central role of an entrepreneur is perceived to be the discovery and exploitation of opportunities to create value. According to Hsieh et al. (2007), opportunities are situations in which products and services can be sold at prices that are higher than their cost of production. Identification of such opportunities and market niches allows entrepreneurs to become an integral part of contemporary society and catalysts for development. Ungureanu (2020) posits that entrepreneurship stands out as a highly integrated concept within the modern global policy approach, with the main idea being that the independence and creativity of entrepreneurs are integral to the attainment of high levels of economic activity globally. Factoring in the relevance of entrepreneurship to the global economy, there has been a quest to determine how entrepreneurial learning can be applied effectively towards boosting entrepreneurs' capacity to solve problems and identify opportunities for the betterment of society. According to Pittaway et al. (2011), entrepreneurial learning is a form of learning that occurs through experience. In instances where an entrepreneur's action is directed towards the creation of new ventures, it entails learning on the go, as the individual aims to develop new experiences. Levitt & March (1988) stated the requirement for new knowledge as an output from knowledge as an input for learning to be deemed to have occurred. On account of the success factors in learning, Piaget (1972) presented mutual interaction, and accommodation of various viewpoints as the critical success factors in learning, while Kolb (1984) presented experience transformation as being integral to the learning process. Despite the different views of how learning takes place, there

is a consensus among experts and researchers that learning needs to entail increasing an individual's capacity to take effective action regarding a particular phenomenon. Of importance in the current analysis is organizational learning, which is a critical process for the achievement of a sustainable competitive edge in the marketplace (Huber, 1991).

Minniti & Bygrave (2001) argued that the success of an entrepreneur is primarily determined by their ability to detect new opportunities in the marketplace and respond to them effectively through problem-solving strategies. Consequently, it is a highly relevant dimension within organizational learning, as it is pivotal in helping organizations remain highly competitive in the marketplace. Owing to the relevance of identification of opportunities and problem-solving to the success of ventures, there have been extensive studies aimed at its comprehension, particularly from the perspective of how it is learned. Dutta & Crossan (2005) assert that by adopting a positivist perspective on opportunities, the recognition of opportunities among entrepreneurs is a multi-dimensional process involving not only the identification of opportunities but also sifting through them to sift the feasible ones from the infeasible ones. In the context of organizational and entrepreneurial learning, an individual's capacity to pinpoint opportunities and participate actively in initiatives aimed at solving the problems hindering the effective exploitation of pinpointed opportunities is primarily viewed as a trait one picks up through practice. That brings up the notion held by Ucbasaran et al. (2003). They perceive experience to be an integral part of the enhancement of an entrepreneur's capacity to identify opportunities and come up with profitable ventures that can exploit those opportunities effectively to realize a profit.

Such a view is backed by the fact that habitual entrepreneurs, as opposed to novice ones, appear to have extensive experience, especially from previous failings, which boosts their ability to make highly informed entrepreneurial decisions (Corbett, 2005). Thus, experience plays a pivotal role in helping entrepreneurs to develop the capacity to pinpoint opportunities in the marketplace. This capacity enables them to solve challenges relating to the exploitation of those opportunities in an effective manner that yields the desired outcomes. It is on that basis that higher-level learning emerges as a pivotal opportunity to impart entrepreneurs the skills and insights they need to be effective problem solvers. According to Cope (2003), higher-level learning is especially vital for enhancing learning from discontinuous learning events. For that, insights are drawn from the individual learning literature. In this literature, there is a consensus among scholars that learning is a continuous process, and challenges stand out as critical enablers of learning. Moreover, according to Appelbaum & Goransson (1997), learning from

more discrete and uncommon events tends to have a transformational effect since when individuals are confronted with non-routine situations, their learned responses and habitual tendencies to do things prove ineffective. Such exceptional circumstances call for increased attention and experimentation. This forces individuals to question beliefs they have often taken for granted and reframe their perception of the situation they find themselves in.

It is on that basis that high-level learning proves helpful as a strategy for enhancing entrepreneurial tendencies, including problem-solving and the identification of opportunities, mainly since it involves challenging accepted norms, frames of reference, and assumptions, toward the development of new ideas. The logic for the success of higher-level learning as a successful approach for entrenched entrepreneurial and organizational learning is that, by nature, entrepreneurship is an inherently uncertain undertaking. That tends to be the case, particularly in the early stages of developing a venture or during periods of extensive changes in the market (Cope, 2003). Mistakes and failures are common in enterprises due to the high level of uncertainty. Thus, as described by Minniti & Bygrave (2001), the success of an entrepreneur depends on the level of alertness displayed by several individuals, which allows them to pinpoint opportunities, cope with the uncertainty regarding the outcome and start initiatives aimed at leveraging the opportunity for a profit through a venture. Moreover, according to Crossan et al. (1995), management theorists argue that learning occurs when it is assumed that there has been a change in how an organization or a person processes information, develops shared meaning, and interprets events. Hence, double-loop learning has a pivotal role to play in enhancing organizational learning towards effective problem-solving and pinpointing opportunities. As highlighted by Lattacher & Wdowiak (2020), mistakes and failures are prevalent phenomena within entrepreneurship due to the high level of uncertainty and ambiguity, and they can serve as useful learning opportunities.

As a result, there are two primary levels of organizational learning that are described in the literature. The first is single-loop learning, which is primarily employed in problem-solving processes, whereby individuals assess the environment, compare the available data with the norm, and determine the appropriate action.

In single-loop learning, individuals tend to browse over the available solutions before picking the most appropriate one to address the problem at hand. Thus, single-loop learning occurs when errors are detected and corrected, thereby allowing organizations to proceed with their goals and policies. Crucially, the activities adopted to rectify the errors and solve the pinpointed problems add to the competencies held by the firm without interfering with the

critical elements of the organization's activities (Corbett, 2005). Conversely, double-loop learning is the process through which individuals compare the existing situation with the norm, question whether the established norm is suitable, and justify it as the most appropriate way of doing things. As such, current organizational standards are challenged, and as a result, a revised set of norms may be adopted on account of them being more suitable for ensuring organizational success as compared to the existing norms (Argyris, 1977). The organization is thus focused on questioning and modifying its fundamental norms, policies, procedures, and objectives to better align with the prevailing conditions in the marketplace. As presented by Argyris (1991), it entails altering the knowledge base or competencies that are specific to the firm.

According to García-Morales et al. (2009), double-loop learning is more appropriate for organizations that operate in highly turbulent environments, thereby enhancing their competitiveness in the marketplace. According to Kantamara & Ractham (2014), there is a direct correlation between organizational learning and the firm's capacity to adapt accordingly to meet the underlying needs in the marketplace. The focus of organizational learning is to gain updated knowledge and foster innovations linked to a commitment to continual improvement. That aligns with the requirements of effective entrepreneurial learning towards practical problem-solving and identification of opportunities for creating new ventures (Kakouris & Georgiadis, 2016). Consequently, double-loop learning is a suitable approach for developing new organizational knowledge that can be incorporated into the corporate learning model. Generally, organizational learning can be perceived as the process of detecting and rectifying errors. Top management teams tend to fragment information on the problem and focus on the elements that middle management can control, thus lessening concern about the issue. The errors are hidden away (Tsutsui et al., 2022). Thus, single-loop learning could be described as a hindrance to effective organizational learning, while double-loop learning is a practical approach to enhancing organizational learning.

2.3 Framework for Entrepreneurial Learning

Economists and policymakers widely acknowledge the relevance of entrepreneurship in the growth of contemporary societies. Ungureanu (2020) clearly supports this argument that entrepreneurship is highly integrated into the current global policy approach. He further adds that the independence, and creativity of entrepreneurs, are pivotal to higher levels of global economic activity. Due to entrepreneurship's relevance to contemporary societies, multiple

studies have focused on understanding the concept to enhance individuals' capacities in becoming successful entrepreneurs. As highlighted by Pittaway & Cope (2007b) and Pittaway (2009), previous studies undertaken in the field of entrepreneurial education have focused on understanding whether the main elements of education are reflective of the different ways in which entrepreneurs are perceived to learn. As researchers have gained more knowledge about how entrepreneurs learn, there is a marked increase in interest in developing programs aimed at simulating such approaches to inspire the next batch of entrepreneurs (Pittaway et al., 2011). As presented by Pittaway et al. (2011), entrepreneurial learning is achieved through experiences. In cases where the action is focused on creating new ventures, it encompasses actions, experiences, and newness. This involves learning on the go as one seeks to develop new enterprises. Moreover, it is a multi-dimensional concept comprising different components highlighted in the subsequent sections. A seven-dimensional entrepreneurial learning framework, as suggested in Pittaway et al. (2011), has been presented below. Based on this framework further research has been conducted.

2.3.1 Action-Orientation and Experience

The first dimension of entrepreneurial learning is based on a key concept that emphasizes the need for action, an orientation towards action, and lessons derived from that action (Pittaway et al., 2011). Action can be perceived as comprising of three elements: the act of doing, the experience one gains from doing, and the knowledge amassed based on reflection of one's experiences. As Jones (2009) posited, the entrepreneurs tend to be action-oriented individuals, and their dominant learning approach involves acquiring implicit knowledge and utilizing learning maps in their practical engagements. Hence, as detailed by Pittaway et al. (2011), effective entrepreneurial learners are individuals who prefer action and are able to acquire knowledge and change their behaviors accordingly based on the insights they have drawn from the newly acquired knowledge. This is a characteristic of the learning on-the-go approach, where knowledge is obtained through experience and the acquired knowledge determines one's behavior and actions in the future. According to Martin & Smith (2010), experience is a pivotal source of knowledge for entrepreneurs, and it features three main streams: mastery, vicarious, and social. One develops mastery experience as a result of repeated accomplishments, which ultimately builds confidence in their abilities and allows them to better manage failures and setbacks. Vicarious experience involves learning from role models and thereby people compare their abilities with their role models (Wood &

Bandura, 1989). Martin & Smith (2010) stated that role models significantly influence entrepreneurial decisions. Social experience encompasses positive encouragement, which has been found to have a positive influence on entrepreneurial tendencies.

2.3.2 Mistakes, Crises and Failure

The second dimension of entrepreneurial learning encompasses mistakes, crises, and failure. Studies on entrepreneurial learning, notably Reuber & Fischer (1999), and Minniti & Bygrave (2001), have highlighted the role played by different forms of experiences in the learning process and its outcomes. These critical learning events are perceived to include instances where one has had to deal with major setbacks and intermittent vital learning events. The key assertion behind this form of knowledge acquisition is that entrepreneurs often undergo accelerated learning that is transformative during crises or periods of difficulty, irrespective of whether the events result in positive or negative outcomes (Pittaway et al, 2011). This perspective is backed by Lattacher & Wdowiak (2020), who elaborated that entrepreneurs tend to profit from critical events through rich learning, and such events include failures. Politis (2008) further commented that due to the high level of uncertainty within entrepreneurship, failures tend to be commonplace, meaning that entrepreneurial learning from failures is a reality and a necessity. The knowledge gained from failure can, in certain conditions, expedite a successful entrepreneurial re-emergence. In contrast, entrepreneurs who have encountered failure may benefit from learning outcomes in other contexts when tackling other critical events.

2.3.3 Reflection on Experience

The third dimension of entrepreneurial learning is reflection on experience. On top of the implicit knowledge that one accumulates through incremental learning as a by-product of experience and transformative learning resulting from crises and failure, another critical element of entrepreneurial learning is reflection (Pittaway et al, 2011). As discussed in the elaborated literature on learning, there is an overwhelming acknowledgement that learning is more effective when individuals who undergo an experience reflect on their experiences. For instance, Kolb (1984) presents an experiential learning model as a suitable way of learning, comprising a four-stage learning cycle, including concrete experience, reflective observation of the new experience, and abstract conceptualization, followed by active experimentation. The reflective phase following an experience is pivotal in the model, which allows an individual to

form concepts and ideas toward an entrenched comprehension of a phenomenon. Studies have shown that reflective entrepreneurs tend to be highly effective learners (Cope, 2003). According to Pittaway et al. (2011), reflection can be in different forms, including observing oneself within the context of an action, observing oneself concerning others, observing learning obtained from experience, and finally, meta-observations that tend to alter one's current frame of reference.

2.3.4 Opportunities and Problem-Solving

The fourth dimension of entrepreneurial learning is opportunities and problem-solving. Minniti & Bygrave (2001) in their work had referred to the capacity to pinpoint opportunities and exploit them effectively through effective problem-solving as a key element of effective entrepreneurs. That view is backed by Hsieh et al. (2007). They posit that the primary role of an entrepreneur is to discover opportunities and exploit them. Opportunities are instances when products and services can be sold at a higher price than their production cost. According to Pittaway et al. (2011), recognizing opportunities and problem-solving in entrepreneurship is a concept viewed from different perspectives within psychology. For instance, it can be perceived as an inborn trait, an intelligible skill that differentiates entrepreneurs, or an attribute one picks through learning from experiences (Pittaway, 2009). In the context of entrepreneurial learning, one's ability to pinpoint opportunities, and get involved in problem-solving initiatives to exploit the opportunities, is viewed as something that one learns through practice. In that regard, Ucbasaran et al. (2003) presented experience as being integral to the capacity of an individual to pinpoint possible opportunities and create a venture to exploit them for a profit. That capacity is based on one's human capital, which comprises four components: general human capital, an understanding of management, industry-specific know-how, and the capacity to obtain the relevant resources to start a venture.

2.3.5 Uncertainty, Ambiguity, and Emotional Exposure

The fifth dimension of entrepreneurial learning is uncertainty, ambiguity, and emotional exposure. There is an established understanding among academicians that entrepreneurship is an inherently uncertain undertaking, for which risks are pervasive, and entrepreneurship is often viewed through the lens of uncertainty (Pittaway, 2005; Pittaway et al., 2011). An entrepreneur's capacity to cope with uncertainty opens their experience of acting in an entrepreneurial manner to a higher degree of ambiguity than other forms of human

behaviors (Pittaway & Cope, 2007a). Such ambiguity is especially pronounced in the early stages of forming a venture and during periods of crisis when businesses undergo extensive upheavals (Cope, 2003). A heightened level of ambiguity or an inability to determine what will happen next, uncertainty about the future, and risking one's financial security can result in a high level of emotional exposure. According to Pittway (2011), entrepreneurs describe their venture as an emotional roller coaster, where their emotional well-being is more intimately associated with their venture than other types of work. In previous research, Pittaway & Cope (2007b) highlighted that emotional exposure stands out as the most complex learning experience to simulate in instances where there is a need to sensitize individuals to the different elements of entrepreneurship. According to Gibb & Hannon (2007), the recognition of emotional exposure as an integral component of the entrepreneurial life should be a key element of entrepreneurial learning.

2.3.6 Social Practice and Social Engagement

The sixth dimension of entrepreneurial learning is social practice and social engagement. According to Pittway et al. (2011), the social dimension of entrepreneurial learning has only recently come to light. That said, its importance is unique primarily because entrepreneurs do not function in isolation with other people, and entrepreneurial activities are often collective. The focus of entrepreneurship is primarily on people since niches emerge from people, which can be exploited through entrepreneurship, resulting in the creation of ventures. This approach makes entrepreneurship an inherently social construct. The social perspective of entrepreneurial learning was first highlighted by Hines & Thorpe (1995) when they discussed learning taking place within a specific context. This view was further expanded by Taylor & Thorpe (2004), which described entrepreneurial learning as a process that occurs through the participation of different individuals. The key point highlighted by these studies is that entrepreneurial learning should be considered a social phenomenon, and entrepreneurs should be considered practitioners who operate within social communities (Pittaway et al., 2011). Consequently, concepts such as groups, peer interaction, and interacting with the community of practice of entrepreneurs prove to be effective ways of evaluating entrepreneurial learning.

2.3.7 Self-efficacy and Intentionality

The final dimension of entrepreneurial learning is self-efficacy and intentionality. There exists a rich body of knowledge regarding self-efficacy and intentionality within the field

of entrepreneurship, whereby the latter is the extent to which an individual is inclined to be an entrepreneur (Pittaway & Cope, 2007a; Luthje & Franke, 2003). On the other hand, self-efficacy is focused on an individual's confidence in their capacity to start ventures (Pittway, 2011). The existing research on self-efficacy and intentionality has highlighted a considerable shift in an individual's intentionality and self-efficacy as they obtain education on entrepreneurship. On that account, the two elements can be viewed as being pivotal for entrepreneurial learning and one's competence in entrepreneurship. The common understanding is that as entrepreneurs gain experience, especially when they experience successes or feel that they have learnt from their failures, their levels of confidence to act will increase, as will their propensity for taking risks (Pittaway et al., 2011). Hence, one's intentions to conduct themselves in an entrepreneurial way can be boosted through experience, a high level of understanding of the relevant activities, and interaction with the community of practice.

2.4 An Elaboration on the Seven Entrepreneurial Learning Dimensions

Apart from the seven entrepreneurial learning dimensions identified by Pittaway et al. (2011), I have identified six related parameters within the dimensions that I chose to examine in depth. These parameters all have an impact on the overall learning and development of entrepreneurs participating in an accelerator program and are discussed separately below.

2.4.1 Dynamic Learning: Learning from Failure and Critical Incidents

Entrepreneurship is regarded as a continuous learning process (Cope, 2005). Entrepreneurial learning can be stimulated by confronting and overcoming challenges. Pittaway et al. (2011) noted that mistakes, crises, and failures can be considered beneficial components that can significantly affect the experiences of entrepreneurs and help them shape their activities. In this regard, Pittaway et al. (2011) reported the findings of three studies that were undertaken from 2006 to 2007. These studies were conducted on students from different clubs, including entrepreneurship clubs, Students in Free Enterprise (SIFE) teams, and investment clubs. The researchers conducted interviews of participants through telephone and email. Pittaway et al. (2011) found that an increased level of action by participants towards new ventures as well as social learning was beneficial for the participants in their business-related activities. As well as these findings, the researchers found that identifying mistakes helped students achieve transformational learning. This is the

process of identifying that one must adapt or modify the way one engages or behaves with people or settings based on new circumstances or ways. In regard to the learning process of participants, researchers have also noted that reflection, learning by doing, and learning through social practice are of primary importance in learning benefits, as opposed to mistakes or emotional exposure. The researchers also noted that learning by doing was related to learning by making mistakes (Pittaway et al., 2011).

Cope and Watts (2000) noted the importance of learning from critical incidents and utilizing that learning in the performance and growth of a business. They conducted a longitudinal and qualitative study on six small businesses and conducted observations and interviews regarding business-related development. Researchers found that critical incidents of entrepreneurship were those related to changes in the awareness and perceptions of business owners. They share the same views on transformative thinking as Pittaway et al. (2011). Despite this, Cope and Watts (2000) noted that entrepreneurs may make mistakes in marketing or multiple processes and may eventually transform themselves in response to new circumstances. Moreover, even though mistakes or critical incidents in a venture are often perceived as negative events, they are most often related to positive outcomes. Furthermore, Cope and Watts (2000) reported that critical incidents can help in improving the level of self-awareness, and this could be linked to the seventh component of self-efficacy, as noted by Pittaway et al. (2011). Consequently, mistakes could be linked to gradual personal development.

Minniti and Bygrave (2001) specifically addressed the effect of mistakes and failures on the activities of entrepreneurs. Their findings align with the mistakes and failure-related components of Pittaway et al. (2011) in that entrepreneurs make mistakes and failures, and after facing those critical incidents, they start making more informed and improved decisions that can eventually help them in optimizing their performance. They also noted that failures could be just as informative as success, though failures are often undesirable incidents. Nevertheless, entrepreneurs who succeed keep on exploring new options regardless of the consequences, whether failure or success and use the learned experiences to modify their decisions for better prospects (Minniti & Bygrave, 2001).

Clarysse and Moray (2004) also supported the mistakes driven transformative learning process. They reported that critical incidents or shocks usually occur in a business. As the business grows, its team members adapt to the shocks. They conducted a study in a setting that is a spin-off from Universite´ Catholique de Louvain la Neuve (UCL): "CINE"

(pseudonym). The researchers wanted to know "why" and "how" teams in a new venture affect the performance of that venture as well as its growth. They kept on visiting the participants who were associated with a start-up venture and not only observed the growth and performance of businesses but also conducted interviews. They found that the team members kept on evolving regarding their activities and their relationships with each other. The researchers referred to this process as an internal reorganization that took place because of external shocks. As time passed, the team members realized that founders cannot always be considered business managers, and this can only be learned through the process of learning by doing (Clarysse & Moray, 2004). The findings aligned with the findings and first component of Pittaway et al. (2011), as both are of the view that learning by doing has an important relation to learning by mistakes.

In another article, Cope (2005) reported that experiencing critical incidents and overcoming problems and challenges in entrepreneurship could be considered rich opportunities of learning. Cope (2005) is slightly different from Pittaway et al. (2011), who found that mistakes, failures, and crises have a small effect on entrepreneurial learning. According to Cope and Watts (2000), learning from mistakes and critical incidents is largely of a personal nature and can be associated with self-awareness; in this instance, however, the learning could also be associated with the seventh component of self-efficacy, as described by Pittaway et al. (2011). However, Cope (2005) supported the transformative type of learning from mistakes and critical incidents, such as failures, as discussed by Pittaway et al. (2011). Cope (2005) noted that when people experience unusual situations their usual ways of doing business and responding to different situations do not work. They must learn to deal with those situations in novel ways. In those situations, people must show a high level of attention and must experiment with novel ways of doing things that can eventually reframe their working methods (Cope, 2005).

More recently, Funken et al. (2018) and Boso et al. (2019) studied transformative learning through mistakes and failures. Funken et al. (2018) conducted a longitudinal 168 individuals relating to venture creation in entrepreneurial learning. They noted that transformative learning takes place, but it has positive effects only on entrepreneurs with a positive attitude towards mistakes and errors. On the other hand, entrepreneurs with a negative attitude towards mistakes and errors could be harmed by failures and problems (Funken et al., 2018). In previous studies, Politis and Gabrielsson (2009) demonstrated that entrepreneurs' attitudes toward failure played a significant role in experiential learning. They

conducted a questionnaire survey and found that the life and activities of individuals play an influential role in the development of favorable attitudes towards failures. For example, previous start-up or venture experience and business closing experiences have strong links to the development of a positive attitude towards failures. Moreover, the involvement of individuals in multiple ventures or start-ups also results in the development of a positive attitude towards failures (Politis & Gabrielsson, 2009).

Boso et al. (2019) conducted an empirical assessment of 240 entrepreneurs in Nigeria. They worked with entrepreneurs from different industries and assessed that the entrepreneurs' experiences related to business failures and their ability to learn from failures. They also reported that an entrepreneur's thinking and ability could turn failures into lessons that can eventually help in improving venture performance. They emphasized the importance of the presence of business-related opportunities in the development of positive attitudes towards failures and learning from them (Boso et al., 2019). In this way, they not only supported the component of learning from failures and mistakes but also supported the fourth component of "opportunities and problem solving" in entrepreneurial learning, as also discussed by Pittaway et al. (2011).

2.4.2 Self-Efficacy and Entrepreneurship: Mastery Experiences and Vicarious Learning

With an increasing experience in entrepreneurship, the level of confidence, as well as the risk-taking ability of individuals increases (Bird, 1992). It can be asserted that with an increase in experience, the self-efficacy and intentionality of individuals also increase, which can eventually strengthen their thoughts of working on a new venture in an entrepreneurial way (Pittaway et al., 2011). As noted by McGee et al. (2009), self-efficacy can be considered as the belief of an individual in their capability to complete a job or activity. The concept of self-efficacy can also be linked to Pittaway's third learning dimension of learning from mistakes, critical incidents, and failures. In this regard, Bandura (1997) noted that individuals with an increased level of self-efficacy can learn from failures in order to further increase their self-efficacy and ability to work on the issues. Therefore, self-efficacy and intentions are considered essential components of entrepreneurial learning and entrepreneurship (Pittaway et al., 2011).

Pittaway et al. (2011) noted the shift in self-confidence and self-efficacy toward creating ventures and setting up businesses, as well as involvement in several aspects of venture creation. Moreover, self-confidence was found to be more strongly linked to specific skills, such as leadership and management of teams, presentation, negotiation, and making networks.

This shows that the involvement of students in entrepreneurial clubs and societies helped develop broader levels of "enterprise skills" (Pittaway et al., 2011).

The importance of self-efficacy has been established by researchers for a long time. For instance, Bandura and Adams (1977) and Bandura (1977) reported that self-efficacy plays a critical role in the behavioral changes of individuals. Bandura and Adams (1977) discovered that perceived self-efficacy was the most reliable predictor of behavioral improvement and that perceived self-efficacy is related to the amount and type of efficacy-related experiences that people have. In another study, Bandura (1977) reported the effects of different conditions on the psychological changes that may appear in individuals and supported the findings presented by Bandura and Adams (1977). They noted that the involvement of individuals in activities that could be considered threatening but relatively safe could help in improving the level of self-efficacy.

In another article, McGee et al. (2009) not only supported Pittaway et al. (2011) by showing the importance of self-efficacy and intention in entrepreneurial motivation but also noted that entrepreneurial self-efficacy is the explanatory variable in entrepreneurial motivation. However, McGee et al. (2009) asserted that self-efficacy could result in positive effects on the intentions of individuals, leading to their nascent entrepreneurial behavior and eventually entrepreneurial actions, and this point is slightly different from that of Pittaway et al. (2011), who noted that the intentions of individuals might not be changed.

McGee et al. (2009) found that self-efficacy can take on multiple forms in conducting a business. In this regard, their findings aligned with the findings of Pittaway et al. (2011), who have also demonstrated the effect of self-efficacy on learning different skills and exploring different phases of entrepreneurial activities. McGee et al. (2009) argued that self-efficacy could increase the intentions of individuals, leading to their nascent entrepreneurial behavior and ultimately entrepreneurial actions, and this point differs slightly from that of Pittaway et al. (2011), who has worked on individuals with exposure to entrepreneurship clubs and societies. McGee et al. (2009) further supported Pittaway et al. (2011) by emphasizing the importance of courses and training programs in entrepreneurial learning that would help improve the self-efficacy and confidence of participants.

Previously, Erikson (2003) also reported that nascent entrepreneurs are established first before any other kind of entrepreneurs, including portfolio, novice, or serial entrepreneurs. Therefore, it can be said that McGee et al. (2009) supported the importance of self-efficacy in entrepreneurship activities, especially in association with nascent entrepreneurs, as discussed

by Erikson (2003). After looking at the articles presented by Erikson (2003), McGee et al. (2009), and Pittaway et al. (2011), the pathway of entrepreneurial learning using intentions and self-efficacy may be established. In the beginning, individuals develop a perception of their entrepreneurial skills and competence. This perception is then related to the development of an intention to be involved in entrepreneurship activities. It is intended that, despite having been established, it could be associated with social activities that improve self-efficacy and participation in entrepreneurial learning activities. Individuals' self-efficacy and self-confidence ultimately determine their willingness to keep exploring entrepreneurship based on previous experiences. Therefore, self-efficacy and entrepreneurship can be linked in a way that facilitates entrepreneurial learning in both beneficial and challenging situations (Erikson, 2003; McGee et al., 2009; Pittaway et al., 2011).

Aside from the importance of intention in improving self-efficacy and self-belief, Erikson (2003) also noted that vicarious experiences or learning after observing others also play an essential role in improving self-efficacy and self-belief. In this case, vicarious learning is the process of observational learning in which the behaviors and actions of other people are modelled for learning purposes. Usually, vicarious learning involves paying attention to other people's actions and behaviors, retaining the information associated with those actions or behaviors, and assimilating and organizing them in memory (Holcomb et al., 2009). Pittaway et al. (2011) also reported that observing other people is essential to improving the entrepreneurial learning process. In this regard, Mansoori (2017) has noted the importance of the third component of reflection in the process of learning, emphasizing that reflecting on one's own experiences as well as on other people's experiences is helpful for entrepreneurs in entrepreneurial learning (Mansoori, 2017).

While supporting the sixth component of "social practice and social engagement" presented by Pittaway et al. (2011), Mansoori (2017) stated that vicarious learning in the early stages of entrepreneurial learning and activities could be strengthened by providing entrepreneurs with some social support. In this regard, Holcomb et al. (2009) not only supported the process of vicarious learning but also noted that most of the knowledge gained by individuals is obtained vicariously. This learning can be related to different dimensions of complex behaviors, for example, learning the process of negotiation and helping others.

The importance of vicarious learning in entrepreneurial learning and the enhancement of self-efficacy has also been found in the study conducted by Alvarado Valenzuela et al. (2020). Their study was part of a more extensive research program conducted in the

Netherlands. The research program was related to entrepreneurial activities and their effects on learning. Their study was a type of qualitative study in which they assessed the students' views after their interviews with entrepreneurs who had experienced failures. The researchers asserted that vicarious learning, especially related to learning from failure, could be among the most effective strategies in entrepreneurship education. Alvarado Valenzuela et al. (2020) found that after interviews and reflections on the experiences of entrepreneurs who have faced failures, students started to recognize the role of trials and errors in entrepreneurial activities. Regarding the relationship of vicarious learning, they noted that vicarious learning could help in improving the self-efficacy of students, and this effect is considered in the case of students who already have a relatively high level of self-efficacy (Alvarado Valenzuela et al., 2020).

In a systematic review, Newman et al. (2019) also noted that the experience of individuals and their development of role models or taking the help of mentors are among the key aspects concerning entrepreneurial self-efficacy. However, they have also noted that entrepreneurial education and training could become the basis of self-efficacy that is then involved in the development of entrepreneurial intentions (Newman et al., 2019). Nevertheless, Alvarado Valenzuela et al. (2020) and Newman et al. (2019) have supported several components of entrepreneurial learning, such as the second component of "mistakes, crises, and failures," the third component of "reflection on experience," and the seventh component of "self-efficacy and intentionality," as outlined by Pittaway et al. (2011).

Conclusively, it can be said that one of the most critical components of entrepreneurial learning is "self-efficacy and intentionality." These components are beneficial as they strengthen the confidence of individuals regarding entrepreneurial activities. With regards to intention, it has been found that individuals may have strong intentions that are unlikely to be significantly modified by the participation of individuals in entrepreneurial activities, whereas self-efficacy is an aspect that is likely to be positively modified by participation in entrepreneurial activities. Moreover, learning from the experiences of other people can also be of significant help in improving the self-efficacy of individuals and their entrepreneurial learning processes over time.

2.4.3 Social Constructionist Perspective on Contextual Learning

Entrepreneurial learning and entrepreneurship are considered social phenomena in which entrepreneurs act as practitioners who operate and practice in social communities (Pittaway et al., 2011). Entrepreneurs must work in coordination and co-participation with other people in

order to achieve success in their ventures. Pittaway et al. (2011) found that after learning through actions and learning through reflective practices, learning through social engagement is the most significant component of entrepreneurial learning. The researchers provided some of the mediating factors that were found to be involved in improved learning through social engagement viz., social gatherings help in bringing individuals close to practicing entrepreneurs and improving their level of interaction; group meetings improve the chances of meeting others with entrepreneurial minds, and these gatherings also increase the level of competition among individuals that can help in improving skills through learning. (Pittaway et al., 2011).

Bandura (1971) provided a detailed account of social learning theory. According to him, some of the points that can be linked to social learning theory include learning through direct experience, learning through modelling, and the involvement of regulatory processes such as stimulus, reinforcement, and cognitive control in learning. Considering these different aspects of social learning theory, the moderating role of experience, conditioning phenomena, and behavior of individuals in entrepreneurial learning can be found, and all of these aspects can be linked to not only social engagement but certain other components of entrepreneurial learning, such as the components of "Action-orientation and experience," "Reflection on experience," and "Social practice and social engagement" that are presented by Pittaway et al. (2011).

Akgün et al. (2003) not only supported the importance of social engagement in the process of learning from the article of Pittaway et al. (2011) but also reported the moderating role of cognition in the learning process, as discussed in social learning theory (Bandura, 1971). Nevertheless, Akgün et al. (2003) found that organizational learning is one of the most popular topics in business-related studies. They noted that organizational learning is a process that is based on interactions of several cognition-related aspects, such as the acquisition of knowledge or information, dissemination of that knowledge or information, as well as its implementation, sensemaking, thinking, memory, emotions, unlearning, and improvisation, with each other and with an organizational culture. They noted that people gather information from different sources, such as acquisitions and new members, in their surroundings. As a result of acquiring information from different sources, they implement the lessons learned into future strategies. In addition, they uncover a variety of problem areas that can also be linked to the process of learning. They may also disseminate the information through informal communication or dialogues with other people. Upon learning new information, the cognitive process of thinking,

making decisions, and unlearning processes to change deeply held beliefs increases significantly. In this way, continuous improvements are possible. The findings of Akgün et al. (2003) also strengthen the transformational nature of learning associated with the learning dimension of "mistakes, crises, and failure" (Pittaway et al., 2011).

Harrison and Leitch (2005) also emphasized the importance of social context. For them organizational learning is a sort of individual learning process that takes place in a social context. Active entrepreneurs are active learners, and they keep on learning from everything. For instance, they learn from other people, including suppliers, customers, employees, associates, and competitors. In the case of customers, they can learn about their changing requirements and utilize that information to make modifications to their business. They can gain insight from competitors about the level of competition as, for example, the competition could be hyper-competition that may require an intensive utilization of information sources (Harrison & Leitch, 2005). The process of learning from everything is one part of learning from social engagement, and Pittaway et al. (2011) also stated that the social environment provides an opportunity for learning that is not typically available through curriculum-based entrepreneurship education. Supporting the work of Akgün et al. (2003), Harrison and Leitch (2005) also noted the importance of cognition-related aspects of entrepreneurial learning in a social context. For instance, cognitive learning relates to the modifications and aggregation of information in an individual's cognitive dimensions that can eventually be found in an organization's performance (Harrison & Leitch, 2005).

Argote and Miron-Spektor (2011) have also noted the importance of social factors, such as social networks, in learning and knowledge transfer and thereby supported the component of social engagement presented by Pittaway et al. (2011). Argote and Miron-Spektor (2011) noted that knowledge transfer can occur through the sharing of experiences with other people. However, knowledge transfer can occur to a variable extent depending on the absorptive capacity of individuals, expertise, or location of sharing the experience. Moreover, social factors could also be influenced by emotional and motivational factors in the transfer of knowledge and sharing of information (Argote & Miron-Spektor, 2011). Another point that has been presented by Pittaway et al. (2011) is that of an increased level of interaction among people, and this point has also been noted by Argote and Miron-Spektor (2011), who showed that it is a form of top-down learning that is different from bottom-up learning, such as learning from experience.

Secundo et al. (2017) supported the component of social engagement in entrepreneurial learning, as discussed by Pittaway et al. (2011) and further noted that social meetings not only in physical life but also in virtual life can help with entrepreneurial learning. For example, professional social networking websites have been found helpful for individuals in improving their learning processes, and intellectual capital, which is helpful in providing knowledge and skills, has been found as one of the most influential mediators in establishing the relationship between social engagement in virtual life and entrepreneurial learning processes (Secundo et al., 2017). They also stated the importance of competition, discussed by Pittaway et al. (2011), that could only be seen in the social context. They further asserted that start-up competitions help in the entrepreneurial learning process. Akgün et al. (2003) also stated that the presence of competitors in an individual's life is advantageous in terms of information acquisition.

Aside from the importance of competition in a social setting, Secundo et al. (2017) have also noted the positive effects of peripheral-central relationships on entrepreneurial learning in the context of social engagement. For instance, they noted that in social engagement, knowledge, resources, and talent keep on flowing between centers and peripheries, which can eventually improve the value of peripheral entrepreneurship. In this case, the periphery could be considered as a setting that is either remote from the center or loosely or marginally connected with it. Therefore, social engagement helps in closing the distance between centers and peripheries (Secundo et al., 2017). This aspect of social engagement also relates to the provision of opportunities by bringing together like-minded people in a social setting (Pittaway et al., 2011).

Conclusively, it can be inferred that entrepreneurial learning can be associated with different components, and social engagement is one of the key components of this learning. A social setting not only helps entrepreneurs improve their experience but also allows them to exchange information and experiences with others. It also benefits by bringing like-minded people closer together and sharing resources with each other, thereby bringing novelty.

2.4.4 Alliances for Learning and Knowledge Transfer: Team Learning and Mentoring

Learning alliances are business associations that aim for the involved parties to learn from one another (Khanna et al., 1998; Marchiori & Franco, 2020). They are crucial components in the construction of inter-organizational alliances, which give rise to private and common benefits for participating firms (Khanna et al., 1998). Partners gain common benefits

when a collective application of learning occurs. These benefits become available when each partner has learned enough to effectively synthesize its knowledge base. Private benefits arise when a firm gains skill from its alliance partner and applies it in unrelated areas. Accelerator programs are designed to foster alliances that result in both private and common gains for start-ups. In order to build the individual capabilities of firms, start-ups should form partnerships to learn from each other. The number of resources channeled in an association indicates how firms view the ultimate benefits they may gain from those alliances.

As with any process, there are challenges in the learning alliance process. Little research has focused on critical challenges that trigger learning in organizations hence the creation of learning alliances. Entrepreneurs can be reluctant to exploit existing networks to solve challenges facing their products and technologies. However, lack of business skills leads them to use these networks. These difficulties can be related to external threats or management and organization. External threats include disagreements with other firms, new technologies, competition, and changes in laws and governance (Soetanto, 2017). These issues create uncertainties in the business environment which cannot be tackled by the existing knowledge and experiences of entrepreneurs. This struggle pushes them to seek and exploit opportunities for peer learning and knowledge transfer.

Team-level learning is an essential aspect of building learning alliances among start-ups. Before start-ups engage themselves in inter-business knowledge transfer, they must have a proven track record with their teams. Team-level learning is essential for companies that encounter stiff competition. These teams are also crucial because innovation occurs due to the integration of many functional areas and disciplines. It requires a team of individuals with different backgrounds and experiences. There are specific activities in which start-up teams learn. These practices include recording, reviewing, filing, new product development (NPD) process, and vision (Lynn et al., 1999). Recording and reviewing are old practices that are still effective today. It started with research that compared students who listened only and those who listened to a lecture while taking notes. A recording is a crucial practice that facilitates team performance as it increases individual knowledge by team members. However, reviewing recorded information is essential and must be done by all team members upon access to the recorded information. Reviewing helps increase individual abilities, leading to better team performance (Lynn et al., 1999). Reviewing involves bringing together heads of the different departments in the start-up such as engineering, marketing, and manufacturing and analyzing information such as quality tests, customer responses, and critical action items needed from

every department. Team members benefit from an in-depth understanding of issues and formulation of a good strategy from the review.

In addition to recording and reviewing, filing, new product development, and vision/goal setting are crucial processes that facilitate team learning. Filing helps teams to access information quickly (Lynn et al., 1999). An effective filing system positively correlates with a firm's overall success rate. Files with information and templates from the accelerator program should therefore be stored appropriately. The new product development process helps new product teams achieve their goals (Lynn et al., 1999). The NPD process has key phases that aid in team-level learning and development. For example, before a product development project starts, teams must screen and assess the market and technical aspects of the product. In addition to recording, filing, and reviewing information, a vision with business goals is necessary. Goals help set a trajectory on which all activities are streamlined. Plans help teams develop focus and give them the motivation to design a strategy in which these goals can be achieved. Therefore, team learning is catalyzed by specific effective practices that serve to build strong teams and business entities.

Storytelling is an effective method for transferring knowledge (Swap et al., 2001). A story in this context entails information regarding organizational history, employee interactions, and intra- and extra- organizational activities. Most of these stories consist of the main plot, the characters, and the result. Lecturers within the accelerator program may use stories of other organizations they have worked with to impact lessons learned. The strength of storytelling emanates from the impact of information retrieved from memory (Swap et al., 2001). Memorable information is more likely to be acted upon than information that cannot be easily retrieved from memory. Shared stories are further relevant because specific episodes and challenges may reoccur in the start-ups who participate in the accelerator. Stories are also more believable than plain information because they are detailed and contextualized.

To sum up, learning alliances are created and sustained through mentorship and peer learning. Learning partnerships help businesses build solid competitive advantages. Knowledge is a precious commodity that is shared in these alliances. It is passed on from one person to another and is triggered by crises, changes in external business factors, and insufficient skills, and experience to solve specific problems. Mentorship and peer learning need an enabling environment to thrive. Parties must not have conflicts of interest, and effective information flow channels must be used to boost that communication. Storytelling is also often

used in knowledge transfer and is more effective and believable than other pedagogical strategies because lessons are contextualized and retrieved from memory.

2.4.5 Decision-Making under Uncertainty, Change, and Ambiguity

The entrepreneurial process is largely unscripted, unpredictable, and uncontrollable. The richness of entrepreneurship, therefore, lies in how it is personally experienced (Morris et al., 2012). Overcoming challenges, and being able to deal with change and uncertainty, are identified as central prerequisites for entrepreneurial learning. Events beyond an entrepreneur's control can change the course of their business. The frenzied activity surrounding entrepreneurship is also acknowledged by De Cock et al. (2020), who see the entrepreneurial journey as an "emotional rollercoaster" where decisions are sometimes made rapidly and where the consequences of getting things wrong can be exceedingly costly. Such situations can create emotional strain, and stress management is a crucial element on the journey of becoming a successful entrepreneur.

Research shows emotions influence entrepreneurial decision-making and results, but little emphasis has been laid on the impact of emotions on new venture survival. Researchers say entrepreneurs' intense and variable emotions affect their venture outcomes. De Cock et al. (2020) amalgamated these findings and formed the concept of an emotional rollercoaster.

Emotions that create tension for the entrepreneur and impact decision-making are taken up by Deakins and Freel (1998). These researchers looked at entrepreneurs in small and medium-sized enterprises, enterprises that can be very vulnerable to major events such as a pandemic or the sudden rising costs of raw materials. Deakins and Freel (1996) applied the learning theories of Kolb (1984) and Hendry (1996) to assist in understanding how decision-making is affected by emotions and uncertainty. While models of the learning process can be useful for capturing the dynamics of individual learning (Kolb, 1984), Deakins & Freel (1996) suggest such models are frequently irrelevant to small firm entrepreneurs. Learning models, like many theories, assume that individuals interact with one another in a large organization or institution. If the entrepreneur has a small workforce, ideas for team development may not be applicable. The entrepreneur must respond and alter behavior as a result of interactions with a broad infrastructure of competitors, customers, and providers of resources, advice, and materials. For instance, Deakins & Freel (1998) consider Hendry's (1996) concept of learning communities, which is helpful in addressing how people interact and learn at large, might not be applicable to a small-business owner. As learning models are prominent throughout the

literature, the cautionary note from Deakins & Freel (1998) regarding their application is relevant as every entrepreneur operates within different parameters. Some are individual entrepreneurs without employees.

Uy et al. (2017) returned to many of the features already covered in the other papers viz. the emotions of decision-making, coping with uncertainty, and applying past decisions to present-day concerns. This was gathered by Uy et al. (2017) as "affect spin" in younger entrepreneurs, or how they are reactive to affect-laden events negatively related to their well-being and venture goal progress. This demonstrates the significance of emotional fluctuations when evaluating venture-related outcomes and the well-being of early-stage entrepreneurs. This supports the notion that emotional fluctuations matter when evaluating venture-related outcomes and early-stage entrepreneurs' well-being. It was also discovered that goal orientation served to moderate the effects of affect spin on psychological health and venture goal progress. High performance-approach goal orientation reduced the negative effects of affect spin on well-being and venture goal progress. High learning goal orientation amplified the negative effects of affect spin on well-being but not on venture goal progress.

Lastly, Morris et al. (2012) presented the entrepreneur as an actor on a journey or a mountaineer climbing an endless peak. They portray learning as not being restricted to the venture. Decision-making is likely to be impacted as the entrepreneur learns more about himself or herself, including their comfort level with ambiguity, risk tolerance, capacity for stress, and need for control (Morris et al., 2012, citing Bandura, 1986). The degree to which one has come to understand their own capabilities, values, and personal needs will determine how willing one is to innovate, expand operations, invest in new technologies, or enter uncharted markets. The central actor in every experience is the entrepreneur, existing "at the moment" (Morris et al., 2012). The literature has shown that entrepreneurs must be prepared to innovate and adapt to change, recognizing history but not relying on it.

2.4.6 Making Sense of Experience – Reflective Learning

Experiential learning enhances the capabilities of learners by gaining conceptual insights and practical expertise. Active learning involves working on practical time-limited work assignments to facilitate collective and personal learning. Under the guidance of skilled tutors, participants engage in self-reflection on applied theories. Action accelerates learning. According to David Kolb (1984), experiential learning is "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combinations of grasping and transforming the experience."

Learning is both a process of creating meaning from experience and a cognitive process of acquiring and structuring knowledge. Understanding and adapting to different situations require reflection. Through reflection on experience and past events, people can get ideas and act differently in similar situations in the future. In this way, experiential learning and reflecting on experience are connected to each other.

Entrepreneurial learning can be defined as: "Learning that occurs through experience when action is directed at new ventures" (Pittway et al, 2011.). A practical and contextual understanding of entrepreneurial learning can be used for designing and implementing effective accelerator programs. Entrepreneurial learning is based on three concepts: the significance of action, the inclination towards action, and experience gained from it. Action is conceptualized as doing the act, experiencing from doing and learning gathered from the experience. It is well known that skills for identifying opportunities and eventually forming ventures are learned, but the question is how this learning occurs for individuals.

Compared to traditional methods of teaching, learning by doing or action learning helps in gaining experience. It also provides students with the opportunity to simulate entrepreneurial learning that may not be possible within the curriculum. When they learn from mistakes and overcome problems, their reflective practices are enhanced. One of the main benefits of entrepreneurial clubs and societies is the opportunity to be a part of social learning and connect with the relevant community of practice.

Understanding, acting, and reflecting are interconnected in entrepreneurial learning. When people learn, they will understand who they can be and will work towards becoming who they want to be (Rae & Carswell, 2000). Learning comprises three dimensions: knowing, doing, and understanding. When people acquire knowledge, they start doing things differently. Cognitive knowledge does not make a knowledgeable person. Learning is a discourse, a meaningful process of constructive activity that creates a new reality through speech and action during the learning process. Learning, when applied to the concept of entrepreneurship, means learning how to recognize opportunities and act on them. It is to understand what will work and realize that it is possible. It is not just gaining knowledge from experience, but also having the desire to start something new. Rae gives an example of how Ana, the managing director of a firm, went on to create her own business. Her intention for the future worked out, and she learned about her business capabilities.

Experience influences the processes of entrepreneurial learning. Experiential learning theory comprises four stages. First, there is a concrete experience that starts the learning

process. In the second stage, the entrepreneur evaluates the problem in detail by reflecting on the experience. After reflecting, the entrepreneur formulates abstract concepts. It involves assumptions about the nature of the problem and the possible ways to manage it. Finally, the entrepreneur develops plans to respond to the situation already experienced. Through active experimentation, ideas are tested, which in turn leads to new experiences, thus creating a cyclical process. Cognitive activity and critical reflection are essential for connecting the different stages in the experiential learning cycle. In addition, metacognition is an essential component of experiential learning, which denotes the process of objectively evaluating and observing performance by distancing emotionally from the actions (Cope, 2005). Entrepreneurs are reflective practitioners as they learn through an ongoing process of action and reflection. Experiences become meaningful only when people think and reflect upon them.

Dewey has defined five phases of reflective learning. The first is an indeterminate situation. It happens when the normal course of activity gets disturbed. An obstruction in direct action is a precondition of reflective thought. Reflective thought begins with understanding the conditions, resources, difficulties, and obstacles of action. The second phase is intellectualization wherein the reflective thinking process tries to define the problem in a situation. Studying the condition of the situation and forming a hypothesis is the third phase. Analysis and verification of both material and social conditions take place in this phase. A possible solution is presupposed, which is called a working hypothesis. It is the plan or idea for the problem to be resolved. The following stages are reasoning and testing the hypothesis by action. Reasoning details the meaning of ideas as experiments are done. The plausibility of the hypothesis is checked with the resources and knowledge available. These thought experiments allow the return to the beginning and can lead to a reformulation of the working hypothesis. The last phase is the testing phase when the working hypothesis is verified by reconstructing the situation. Practical testing of the hypothesis alone can help to analyze and draw conclusions about its validity. The testing may not always result in confirmation of the hypothesis, but it helps to learn as the outcome and the initial suppositions implied can be compared (Meittinen, 2000). According to Dewey, meanings and ideas are not formed in the mind alone. They arise from the exchanges between the environment and humans, in practical activity.

Learning from triumphs is crucial to the process of entrepreneurial formation. Entrepreneurial learning develops through experience. Through achievements, people learn about their capabilities. Personal motivation and setting goals are significant for learning and

progressive development. Critical learning events stimulate reflection. Entrepreneurial capabilities develop better with the ability to learn actively and faster from different sources

2.5 Derived Research Questions

Experiential approaches have been found to be valuable in guiding entrepreneurial learning (Wang & Harveen, 2013). To understand the dynamics of acceleration programs in facilitating learning, the researcher will apply experiential learning theory (Kolb, 1984; Politis, 2005). Research on entrepreneurial learning in the context of accelerator programs is limited to date. In contrast, most entrepreneurial learning research has focused heavily on individualistic approaches (Wang & Harveen, 2013) that examine the cognitive processes by which entrepreneurs acquire data, information, skills and knowledge (Politis, 2005; Holcomb et al., 2009). A growing body of literature on entrepreneurship has identified social interactions as a source of collective learning (Pittaway & Cope, 2007b; El-Awad et al., 2017). Nonetheless, this research stream neglects to explain how the coordinated and time-constrained context of accelerator programs facilitates learning. Therefore, we have a limited understanding of how learning occurs. This study examines phenomena that are less well known and theoretically established. The primary objective of this study is to contribute to the further development of theoretical concepts within entrepreneurial learning in accelerator programs and build on previous research.

Crucially, considering that an understanding of the business side of innovations is obtained through entrepreneurial knowledge, the current study seeks to determine the factors that promote entrepreneurial learning in accelerator programs within the health industry. Furthermore, for the current study, the specific problem is determining the nature of entrepreneurial learning and the factors that facilitate it within digital accelerator programs. Among the different functions of accelerators, of importance to the current study is how they bridge the entrepreneurial knowledge gap, thus making it possible for start-ups to navigate the journey of transitioning their inventions into sustainable business ventures. The objective of this study is to gain a deeper understanding of what factors promote entrepreneurial learning in accelerator programs. Considering this, my research addresses four primary research questions:

2.5.1 What Impact Do Entrepreneurs' Present and Past Experiences Have on the Experiential Learning Process?

The entrepreneurial learning process can be viewed as a series of "learning events" (Cope, 2003). Learning events occur during the venture creation process and are acted upon by entrepreneurs, which results in them reflecting upon, acting upon, and creating meaning from their experiences (Cope & Watts, 2000; Rae, 2013). A similar view is supported by the observation that habitual entrepreneurs appear to have extensive experience, particularly from previous failures, which enhances their ability to make highly informed entrepreneurial decisions (Corbett, 2005). According to Cope (2003), higher-level learning is particularly useful for enhancing learning from discontinuous learning experiences. Learning events also contribute to ongoing learning that is used to guide actions in the entrepreneurial process (Cope, 2003; Taylor & Thorpe, 2004; Pittaway & Thorpe, 2012). As a result of answering this research question, I will be able to demonstrate how accelerator participants can improve their learning processes by gaining and exploiting implicit knowledge.

2.5.2 What Are the Mechanisms by Which Entrepreneurial Learning Processes Are Activated in Accelerator Programs?

Learning may be intentional or accidental, but it is typically instrumental in that it helps people accomplish goals by applying what they have learned. Personal values, motivation and purpose setting all appears to be closely related to an entrepreneur's learning. Personal theory refers to how individuals organize and apply the meanings gained from learning events in their decision-making and goal-oriented behavior (Rae & Carswell, 2000). For entrepreneurial learning, the development and organization of personal theories are essential. It was evident from the study by Rae & Carswell (2000) that the respondents integrated some critical themes like confidence, personal values, setting ambitious goals, and known capabilities to develop their entrepreneurial abilities. In that regard, Ucbasaran et al. (2003) presented experience as being integral to the capacity of an individual to pinpoint possible opportunities and create a venture to exploit them for a profit.

It has been emphasized by studies that entrepreneurial learning should be viewed as a social phenomenon, and entrepreneurs should be viewed as practitioners who operate within social communities (Pittaway et al., 2011). By influencing the acquisition and use of pertinent knowledge, skills, and competencies, learning is a critical process that can affect the outcome and performance of new venture creation initiatives (Corbett, 2007; Deakins and Freel, 1998; Gabrielsson & Politis, 2015). Research suggests that intermediaries assist start-ups by

connecting them with local resources (Armanios et al., 2016; Amezcua et al., 2013). To activate entrepreneurial learning, I specifically emphasize the importance of the social and networking aspects of accelerator programs. I explore accelerators as network builders, helping startups expand their networks by providing immediate access to support and guidance, and establishing connections with other industry professionals.

2.5.3 What Should a Virtual Accelerator Program Provide for Entrepreneurial Learning to Occur?

For entrepreneurial effectiveness, learning is essential. (Rae & Carswell, 2000). As accelerators have increased in popularity and more start-ups are enrolling in these programs, there has been an increase in research on the nature of these types of programs. Studies of accelerators have primarily focused on determining the effectiveness and results of the programs (Miller and Bound, 2011; Winston Smith et al., 2013; Isabelle, 2013; Levinsohn, 2014; Cohen and Hochberg, 2014; Pauwels et al., 2016; Hallen et al., 2019). The results of these studies, however, differ significantly. They do not provide information about the specific learning effects entrepreneurs experience. Furthermore, they do not provide information about what components are essential to incorporate into an accelerator program for entrepreneurial learning to occur. This thesis aims to fill this gap by studying how a digital accelerator program can support entrepreneurial learning. It also aims to give recommendations on how the program design can be adjusted to facilitate this learning.

2.5.4 How Does a Virtual Accelerator Program Impact Entrepreneurial Learning?

A limited amount of research has been conducted regarding the differences between digital and physical accelerator programs in terms of their impact on entrepreneurial learning (Cruz, 2021). In response to COVID-19, accelerator programs were required to adopt an online format. Cruz (2021) highlights the fact that digital interactions present unique opportunities for entrepreneurial learning. Virtual accelerators provide opportunities for flexibility, a wider audience, cost-efficiency and customized programs. In order to make the virtual program at least as effective as the physical one, preferably even more effective, the challenge lies in exploiting the opportunities in a way that enhances learning. As a result of online communication limitations, cohorts might have difficulties engaging in social interactions, building networks, exchanging experiences, and supporting one another by

providing constructive feedback. As part of my research, I intend to examine the strengths and limitations of a digital accelerator model.

Various data sources will be analyzed in order to answer the research questions, including needs assessment interviews, direct observation, semi-structured interviews, and a focus group discussion. In addition, I will benchmark the accelerator program on the seven-dimensional entrepreneurial learning framework by Pittaway et al. (2011). In addition, I will propose recommendations and a framework to overcome the shortcomings identified from the data gathered before, during and after the accelerator program.

3 Methodology

This chapter outlines a pathway for the research methodology and data collection process. It will cover the underlying research design, including research philosophy, research strategy and the data collection process. Empirical ideas and views from the literature review have been incorporated to develop effective data collection tools that have been deployed to gather data. This chapter demonstrates these points and outlines how they were employed to operationalize the research and develop the key points of interest. This culminated in the research strategy used in the study. The aggregated data from my research will be used to formulate a framework for entrepreneurial learning in a digital accelerator program.

3.1 Research Design

For a study to yield reliable results, determining a suitable study strategy is vital. Credible results need to be informative and relevant in providing a clear understanding of how digital accelerator programs could help hasten entrepreneurial learning for digital health start-ups to accelerate their success in the marketplace. Consequently, to ensure that the research follows a systematic approach, an onion-based framework has been used. An illustration of the research onion is given below:
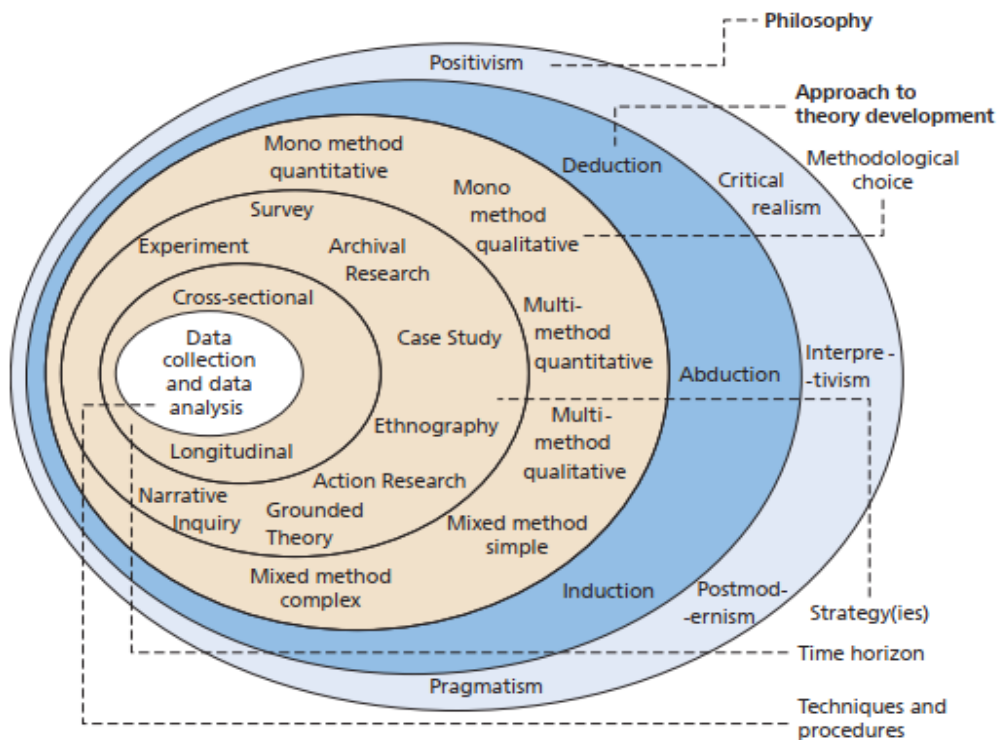
Figure 4: Research onion (Saunders et al., 2019)

3.1.1 Research Philosophy: Interpretivism

The outermost section of the research onion above is the research philosophy. This refers to the underlying beliefs that inform a study and that the researchers leverage in the study. The relevance of a research philosophy to a study is that it dictates the approach to be taken in developing theories, the research methodology to be employed, and the techniques that will be utilized in the collection and analysis of data (Saunders et al., 2019). As a systematic enquiry into knowledge, research must support a particular philosophical approach to draw conclusions that add up to knowledge (Williams, 2007).

The interpretivist philosophical tradition has been used to pursue this study. Interpretivism is a research philosophy that leads to theory building (Saunders et al., 2019). As described in Chapter 1, the evolution of accelerator programs was driven by convenience and the need to organize and optimize the training, development, and initial investments in start-ups in a specific range of products and services. Due to the relative nascency of accelerator programs, it is necessary to use an interpretivist approach to document the way accelerator programs work in developing talents and preparing the next generation of start-up entrepreneurs in this specialized field of digital health to build viable and profitable businesses. Considering that the interpretivist research approach aims to offer a new and richer understanding of the social world within its contexts, interpretivism has been deemed the most appropriate research perspective (Saunders et al., 2019).

Interpretivism is suited to exploratory research. Exploratory research documents the nature of a phenomenon of interest from first principles (McNabb, 2018). This involves giving something that was not well studied in the past a theoretical or conceptual value. Moreover, interpretivism as a research philosophy relies on the expertise of the researcher to study a particular phenomenon and document it as it exists. This involves the observation of key elements of the area of research interest and provides an expert-level analysis of the key variables and how they exist in space and time. The researcher, as part of the study, has experience in the start-up accelerator industry and can provide a comprehensive overview of it.

A positivist philosophy, on the other hand, would be too rigid in outlining the actual nature of training and development of start-up managers in accelerator programs. Realism would provide a rather critical and confrontational approach to a study like this, which would make it difficult to formulate a useful model from it. Therefore, it is imperative to use a model

that promotes the application of expertise to study the nature of digital start-up accelerator programs and explain how they can be optimized in the future to help other start-up managers accelerate entrepreneurial learning.

In line with these constraints, the study was conducted through an interpretivist approach which involves the observation of the interactions of different variables of interest (Sofaer, 2002) to invoke a model for entrepreneurial learning in an accelerator program. This will involve the observation of how a typical accelerator program in the digital health sector works to develop leaders and contribute to the building of viable start-ups that can meet their objectives across a variety of entities in the industry.

3.1.2 Research Approach: Abductive Reasoning

The second outermost layer of the research onion requires the determination of the research approach, which refers to the plans and procedures for conducting research. Data collection, analysis, and interpretation are all part of the research approach, which begins with general assumptions and progresses up to comprehensive methods of data collection and analysis.

Research approach refers to the way meaning is extracted from a given set of data within a specified set of parameters (Saunders et al., 2019; Williams, 2007). There are three distinct research approaches for developing theories - deductive, inductive, and abductive approaches. The deductive approach involves commencing research with a theory, which is then tested for its validity (Saunders et al., 2019). For this reason, the deductive approach to research stands out as the pivotal approach for undertaking natural science studies. The second research approach is induction. In this approach, a researcher collects data to explore a phenomenon and based on the findings from the data, the researcher then generates and builds theories. Consequently, as opposed to the deductive approach, which is aimed at verifying a theory, the inductive approach aims to develop theories. The third research approach is the abductive one, where data is collected to investigate a phenomenon, pinpoint themes, and outline patterns, to develop theories or modify existing theories, which are then tested using additional data collection (Saunders et al., 2019). Thus, an abductive approach to research entails generating or modifying theories where appropriate to develop new or modify existing theories.

Accelerator programs are utilitarian. The scope of the functionality of accelerator programs varies significantly. Therefore, using an inductive approach would mean studying a

very small section of a vast and fast-emerging industry that functions based on a wide array of circumstances and factors. On the other hand, a deductive research approach would involve a simplistic mechanism of studying just a few variables that might even become irrelevant in a short time. Therefore, an abductive approach will be employed for the current study, essentially combining both deductive and inductive research approaches. In that regard, the approach will involve commencing with the observation of the phenomenon of digital health accelerators, from which it is perceived that their success emanates from providing invaluable entrepreneurial lessons to start-ups to bolster their business models and increase their chances of success in the marketplace (Saunders et al., 2019). That perspective will then be tested to determine its accuracy in the context of the digital health ecosystem. The abductive approach is essentially used to ensure that nothing is missed in the pursuit of discovering all underlying elements that pertain to the subject of entrepreneurial learning in virtual accelerators for health start-ups.

Abductive reasoning is aimed at defining the best practices or most appropriate explanations for a given phenomenon (Walton, 2014). By applying the principles of deduction, the insights from the theoretical framework helped identify and further develop elements that are crucial for entrepreneurial learning in a digital accelerator program. Based on the empirical data gathered, following the principles of induction, further research has been conducted. In summation, the qualified and informed understanding based on abductive research has been linked to established theory and to the insight from the empirical data.

Abductive reasoning allows for various theoretical frameworks to be formulated from a given study which can be applied in many situations. As a result of using the abductive approach, the researcher does not assert to make an absolute statement about the topic, but rather, to formulate a reasoned and informed conclusion which may lead to the development of theories that can be applied to similar situations.

3.1.3 Research Methodology: Qualitative

The choice of research strategy involves determining whether to employ a qualitative, quantitative, or mixed-methods approach. A qualitative research method is employed when exploring the meanings that individuals attach to their experiences. The research process entails the questions and practices that accrue to the collected data within the settings dictated by the research participants (Saunders et al., 2019). Qualitative research is closely linked to interpretive philosophy. This is because researchers are keen on understanding the subjective

and socially constructed meanings and perspectives that are expressed concerning the phenomenon they are studying. To that effect, qualitative research studies the meanings of participants, and the relationships between them by employing various data collection techniques, and analytical procedures. This is done to develop a conceptual framework and theoretical contributions. Conversely, quantitative research designs are often associated with the positivist research philosophy, particularly when used in conjunction with pre-determined and highly organized approaches to data collection (Saunders et al., 2019). Quantitative research is often linked to the deductive research approach, where data is collected and analyzed to determine the accuracy of a theory. A qualitative approach is a suitable strategy when the aim is to build a theory (Bell et al., 2019). A central purpose of this study is to further develop entrepreneurship education theory within the context of an accelerator program. It is a central purpose of this study to build on previous research since it explores phenomena that are less known and theoretically established. As a result of the limited and underdeveloped state of existing theory, a qualitative design is an appropriate choice of research methodology.

The essence of qualitative research is to provide insights into the motives and drives that explain or define a given situation studied in research (Creswell, 2008). Qualitative research is a contrast to quantitative research which examines the numerical or statistical value of a given situation. Such quantitative pointers are not very relevant in this kind of exploratory research into the core components of what defines successful entrepreneurial learning in a virtual accelerator program. Rather, an informed view of best practices, common trends, and the underlining motives for them as well as the anecdotal evidence that explains them will be the essence of this study. This requires a qualitative approach rather than a quantitative one. This study is not intended to generalize the findings to a larger population, as is often the goal of quantitative research. The results of this study are targeted at providing an indication of and insights into what promotes entrepreneurial learning in accelerator programs. The findings can therefore be used as a starting point for further research.

3.1.4 Research Strategy: Case Study

Within the context of their real-life settings, the current study aims to understand how entrepreneurial learning occurs within digital health accelerators. The most appropriate research strategy for the current study is case study based since it features the capacity to provide insights into a phenomenon, following intensive and in-depth research into the study within its real-life context (Given, 2008). The result is a rich and empirical description of the

phenomenon and the development of theories (Yin, 2018). Specifically, the case study will entail a digital health accelerator program for the health industry in the Nordics to understand how the accelerator institutes entrepreneurial learning among start-ups and how that enhances their probability of success within the marketplace.

In this research, an embedded and revelatory case study has been used. The main object of study is the accelerator program, and the sub-units are the five participating start-up companies. The case study is revelatory since it examines and observes "a phenomenon previously inaccessible to scientific investigation". However, a revelatory case study does not have to be limited to situations where no prior studies have been conducted (Yin, 2018). Research on entrepreneurial learning in accelerator programs is scarce; and there is very limited research on entrepreneurial learning in a virtual accelerator program for the healthcare industry. Case studies are advantageous for examining contemporary, complex and dynamic situations, and entities. Case study design proponents often favor qualitative methods, such as direct observation and semi-structured interviews, because these research techniques are seen as highly useful for producing an in-depth, detailed examination of a case (Bell et al., 2019).

The techniques for data collection are a blend of semi-structured interviews, direct observation and focus group discussion (Saunders et al., 2019). The case study will help in identifying the ideal expectations of an accelerator for the healthcare industry and how these expectations can be operationalized to achieve specific goals. This will lead to the identification of the best practices and core goals and ends that are sought in setting up and running a digital start-up accelerator program. The essence of the case study is to define an aspirational framework for accelerator programs and what they seek to achieve.

3.1.5 Sampling Method

As a part of this research, an attempt has been made to identify best practices to run accelerator programs for digital health companies in a Nordic country. The industry of interest is the digital health industry with an emphasis on start-ups that produce products and services related to digital health, welfare technology and medical technology. The sample consists of participating co-founders and CEOs from the five participating start-ups in the accelerator program. To answer the research questions, the sample was selected according to the study's objectives. The companies have also agreed to contribute to the improvement of the program as a pilot cohort. The research work has been adequately supported by the program director and the participants in the accelerator program.

3.1.6 Time Horizon: Longitudinal Design

There is often a longitudinal component to case study research. Researchers often participate in an organization for many months or years. In addition, researchers may conduct interviews over an extended period. Alternatively, archival information and retrospective interviews can be used to add a longitudinal element. This research was conducted in the form of a cohort study with a longitudinal design. Cohort studies are usually designed longitudinally to map long-term changes (Bell et al., 2019). Archival information in the form of KTH scoring and pre-accelerator interviews has been used to gain an understanding of the companies' starting points and goals before participation.

The research period was from January 2021-November 2022. From January to March 2021, an accelerator needs assessment was conducted with ten scale-up companies in the Norwegian Smart Care Cluster. In the fall of 2021, a literature review on entrepreneurial learning, digital health and accelerator programs was conducted. I participated in the EIRAccelerator pilot program from August 2021 to May 2022 along with the five participants in the pilot cohort. The participants were interviewed a month after completing the program. The focus group discussion took place two months after program completion. The fall of 2022 was spent analyzing and discussing the collected data, including proposing a model for entrepreneurial learning in an accelerator program.
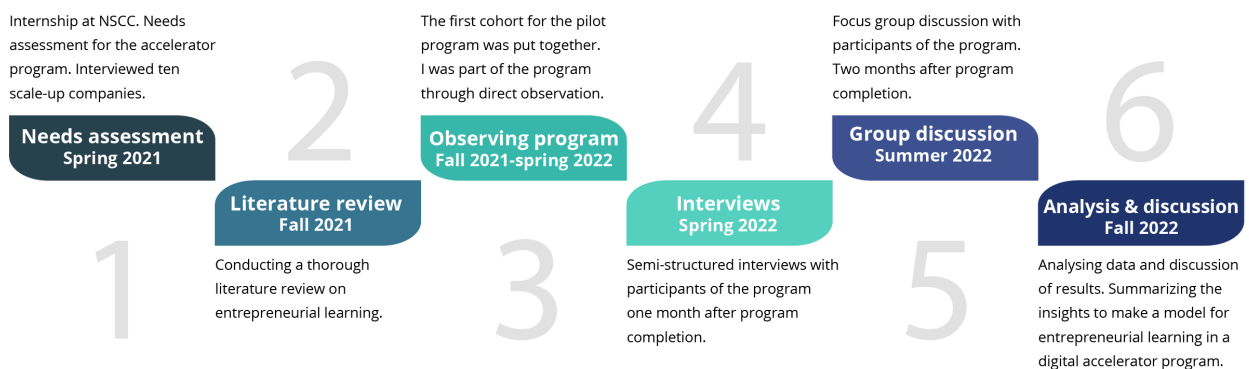
Figure 5: Timeline of the study

3.1.7 Data Collection Techniques

This embedded case study employed three complementary research techniques to gain varied insight into the phenomenon studied. The data collection consisted of semi-structured

interviews and focus group discussions followed by a questionnaire for capturing allied responses.

Primary data collection

Needs assessment

In the spring of 2021, I carried out an intensive needs assessment for the accelerator program. An intensive needs assessment process examines a few cases in depth (Watkins et al., 2012). I interviewed ten start-up companies as part of my internship at Norwegian Smart Care Cluster about what they deemed would be essential components of an effective accelerator program. All ten companies were members of NSCC and in a phase that aligned well with the intent and goals of the accelerator program that was being planned. The interviews lasted 60 minutes. The needs assessment I conducted was used for planning the main components of the accelerator program. This was done by appropriately tailoring the program to resolve the case companies' current challenges and help them enter an acceleration phase.

Semi-structured interviews

The primary data collection method utilized was in-depth semi-structured interviews conducted with all participants in the cohort in the accelerator program. Each interview lasted 60 minutes and was transcribed immediately after it was conducted. Semi-structured interviews are a highly effective method to collect detailed information on a candidate's thoughts, experiences, feelings, and actions, as well as to explore various issues in depth. As a result, the method is effective at obtaining detailed information about founders' experiences. To explore the factors that promote entrepreneurial learning in the program, participants' own stories are the most valuable source of information. As these interviews constitute the primary data collection method for this study, most of the space in this section will be devoted to describing the interview process.

In this study, interviews were used to understand respondents' views on how accelerator programs foster entrepreneurial learning. The questions outlined key elements of their experiences and learning processes during the accelerator program's activities. The seven entrepreneurial learning dimensions developed by Pittaway et al. (2011) were used to develop the interview guide, in which questions were based on conditions that promote entrepreneurial learning. Besides receiving input from the supervisor, the interview questions were pre-tested

with a fellow student and a start-up company owner with accelerator experience outside of the program.

Figure 6: Entrepreneurial learning dimensions derived from the framework of Pittaway et al. (2011)

Semi-structured interviews were conducted a month after the accelerator program was finished. Following the interviews, a focus group discussion was held one month later. The semi-structured interviews were conducted on video conference platforms. This was beneficial due to geographical distances and time constraints. I accommodated my interview plan to the interview objectives and their schedules.

The semi-structured format of the interview guide helped to focus on core concepts in entrepreneurial learning literature. It also opened for free-flowing discussions allowing the participants to expand on topics of interest. The interviews provided helpful guidelines about how accelerator programs work and how they influence and affect people in various capacities and roles. The premise of the approach was to establish a positive tone at the beginning of the interview, an approach that encouraged participants to share their experiences freely. The interviews were semi-structured in the way that the topic of the conversation was set in advance with the quality-assured interview guide being divided into seven categories, where the questions were designed to cover the seven entrepreneurial learning dimensions. The focus has been to formulate questions on a single problem or issue, specific and complex enough to answer thoroughly, avoiding double-barreled and leading questions. All participants were

asked the same questions, but in differing orders depending on when topics came up in the discussion, following the flow of the informants. Follow-up and probing questions were also included to gain a deeper understanding of what was shared. The narratives were intended to be left intact and overt commentary was avoided. Additional questions were asked at the end after reading the participant's narrative of the interview. After each interview, the approach taken was reflected upon to develop interview techniques. This gave room to improve the approach in real time and allowed a chance for comparison of answers.

Focus group discussion

The focus group discussion was a live, informal online discussion with the participants. The facilitators were the program director and the project manager, who are best acquainted with the start-up companies. Focus group research is characterized by active interaction between participants, a distinctive feature separating it from individual interviews (Hennink, 2014). Focus groups are closer to "naturalistic" conversation in that they tend to include storytelling, joking and disagreement. The dynamic quality of group interaction is harnessed as participants discuss and debate key issues. A focus group discussion is suitable for research that aims to elicit people's understandings, opinions, and views; seeking to understand how they are developed, elaborated, and negotiated within the social context (Hennink, 2014). The focus group informed the discussion part of the thesis, as well as highlighted key categories and sub-categories of the results from my semi-structured interviews.

Direct observation

The researcher observed the accelerator program through direct observation to obtain first-hand insights into the factors within the program that might be fostering entrepreneurial learning. The purpose of observation was to gain insight into group dynamics and the experiences of the companies during the program. This was done using the experiences that stood out as reference points in the interviews. The researcher strived to be as unobtrusive and detached as possible in order to minimize bias. I did this by not participating in discussions and having the webcam always turned off. During the program, comprehensive notes were taken to avoid any information loss. This enabled a solid contextual understanding since the researcher followed the entrepreneurs during the whole program, from screening through acceleration.

3.2 Data Analysis

Following the transcription of interviews, the raw responses were analyzed through the lens of key concepts and theories identified in the literature review. This provided a mechanism for sorting through the trends to formulate theories and general trends. These theories could be used to create a model of best practices for running a digital health accelerator program. The analytical approach was based on thematic analysis. This analytical method is a well-fitted choice for my study since the research questions are of both experiential and societal relevance. The experiences of the companies are highlighted, rather than factual observations. The data was organized into seven pre-made categories, with sub-categories for coherence.

To process the large amount of data collected from the interviews, NVivo software was used. Using NVivo software, data was organized after transcribing all the interviews. This software was utilized to enhance transparency and establish a comprehensive organization of data (Bazeley and Jackson, 2013). The data was organized into categories and sub-categories. A key aspect is the entrepreneur's understanding of what the learning outcome was, how it occurred, and what consequences it had. After analyzing all interviews, a macro-level overview of the learning outcomes from the program was analyzed and presented. The most relevant pieces of information were selected from the field notes and transcriptions.

3.3 Validity and Reliability of Research

Reliability refers to the stability and consistency of a measure, and whether the results your research yields can be reproduced by other researchers under the same conditions. Validity refers to the accuracy of a measure, and the extent to which an instrument measures what it was required to measure (Saunders, 2019). Typically, validity and reliability are perceived to be a preserve of quantitative studies. A qualitative research method differs from quantitative research in that it deals primarily with non-numeric information and phenomenological interpretations which are inextricably linked with human sensing and subjectivity, rather than dealing with numerical data and their statistical interpretations under a reductionist, logical, and strictly objective paradigm. Even so, researchers have now devised alternate approaches for assessing the reliability and validity of qualitative studies. In that regard, Creswell & Poth (2016) propose a reliability determination by reviewing questionnaires used in surveys. As part of the current study, the questionnaire will be evaluated by my supervisor as well as individuals with industry experience. This will enable me to identify any

ambiguities or inherent biases. Their suggestions will help in developing a survey questionnaire, which meets the validity requirements. After this initial evaluation and editing, I will further discuss, evaluate and develop the survey questionnaire with the accelerator program manager, and with my supervisor.

Quality criteria for qualitative research coincide in many ways with quality criteria for quantitative approaches; to generate new knowledge, systematically and transparently. However, quality criteria and validation procedures in qualitative research depend on the epistemological point of view. Some qualitative researchers reject validity criteria in their entirety due to their strong associations with the quantitative conceptual apparatus. However, there are common quality criteria applicable to both quantitative and qualitative research, which can be summed up in four questions:

1. *Is the study original and innovative? Does it generate new knowledge or offer new perspectives on the topic?*

Although there do exist a few studies on what takes place in an accelerator program, and what effect they can have on the participating companies, there are rather few studies that investigate *how* entrepreneurial learning takes place, e.g., evaluating what factors are critical for entrepreneurial learning. Moreover, researchers interview participants after the program is finished, without participating in the program themselves. A deeper insight into the respondent's experiences will guide the interviewer and help her create follow-up questions tailored to each participant. Furthermore, there is a lack of studies that examine the first cohort of an accelerator program, studies that examine an industry-specific or virtual accelerator program, and studies on Nordic accelerator programs.

2. *Is the research question theoretically, practically or socially relevant?*

The research question is formulated in a way that can help develop a theory in the field of entrepreneurial learning. It has practical relevance for the program manager and the entire cluster behind it. Additionally, it is of social importance, since helping health start-ups succeed will benefit many people by providing them with a higher quality of healthcare. This research would also be a guideline for future accelerator programs in general and in the health industry specifically.

3. *Does the study use precise and valid data?*

The study used data from a variety of sources. Firstly, data was collected from a needs assessment regarding what healthcare start-ups want and need from an accelerator program before the program was developed. Secondly, all participants in the pilot cohort were interviewed at the end of the program, applying the business readiness level approach to score them on six key dimensions. Thirdly, semi-structured interviews are conducted with each participant one-on-one. After this, the program is evaluated in a dedicated three-hour group evaluation. Furthermore, participants have been informed that a master´s student will participate and interview them after the program. The participants have signed a consent form from the accelerator manager. This form expresses their willingness to participate in research to help gain insight into entrepreneurial learning and develop the program further. This prepares them for reflection during their participation in the accelerator.

4. Are the conclusions substantiated by the study?

The conventional view of validity assumes there are real and fixed phenomena (such as personality traits) that can be revealed and measured. Many qualitative researchers would disagree with this stance. Instead, assessing the validity of qualitative research may focus on the validity of the analysis undertaken by examining its goodness of fit with the data. Potter (1998) has described this as a 'justification of analytic claims' (as cited in Howitt, 2010). Meyrick (2006) argues that a focus on practice is favorable to scientific discussions. As a part of the methodology, practical research questions have been selected giving hands-on insight that can be applied to the further development of the program. Moreover, it is imperative to remove sources of error. Oakley (2000) argues that awareness and recognition of errors is a key distinction between high-quality and low-quality research. Meyrick further argues that diversity is critical for successful qualitative research, as well as quality assurance tools such as transparency, a systematic approach, pluralism and the use of triangulation. I used four data collection strategies for the triangulation of data: needs assessment interviews, semi-structured interviews, focus group discussions and direct observations. The main aim of triangulation is to steer clear of the personal biases of the researcher and overcome the limitations inherent to single-theory and single-method research thus increasing the reliability and validity of the study (Denzin, 1970). In addition, more than one theory has been used as a theoretical framework, to guide decisions regarding the research design and to understand and decipher research findings.

Many qualitative researchers avoid the terms validity and reliability and use other terms such as credibility, trustworthiness, quality, applicability, consistency and confirmability, when referring to criteria for evaluating the scientific merit of qualitative research (Glaser & Strauss, 1967). A crucial consideration when collecting data through questionnaires or interviews is the truthfulness of the responses. The participants in the study can pose threats to validity and reliability, typically because of a desire to describe matters as better or worse than they are, introducing bias fallacy (Miles & Huberman, 1984). This can for example be due to fear of repercussions or a desire to meet the expectations of the researcher. In order to counteract this, I have provided the participants with clear information. This includes the purpose of the study and my presence, data collection methods and presentation of results. Since I informed participants that findings would be anonymized, trust was built, and a free zone was created for them to tell the story of their own unique experiences. Furthermore, I compare the results from my different data collection techniques with each other, e. g. results from semi-structured interviews with direct observation, and results from group discussion. I wrote accurate and elaborate field notes to be able to observe discrepancies. Incorporating rich and detailed verbatim descriptions of participants' accounts ensured the credibility of the findings. After I was finished writing my thesis, I shared it with the participants for them to read my conclusions, requesting feedback on accuracy. Participants are invited to review the interview transcript and to comment on whether the final themes and concepts adequately reflect the phenomenon being investigated. This step was conducted in order to establish consistency.

Establishing validity and reliability of data requires consideration of the societal context in which they are gathered. When confronted with different societal circumstances, informants may be expected to behave differently, for instance, if they are alone with a researcher as opposed than in a group. To identify similarities and differences in the data collected, I have conducted data collection in a variety of settings. The physical, social, and interpersonal contexts within which the data was collected have also been described.

Systematically evaluating qualitative research can only be accomplished if its criteria and procedures are clearly defined. Therefore, validity and reliability can only be assessed when the context and setting within which the study was conducted are described. This is followed by a detailed description of the data collection procedures from the beginning to the end. This is what qualitative researchers often refer to as thick description, or what Lincoln and Guba (1985) call auditability. To be auditable, a study must be able to be followed and understood by any reader or researcher. To achieve this goal, the researcher should disclose

how they became interested in the study's subject matter, the purpose of the study, and how they selected subjects. In addition, the researcher must give an account of how the data was collected, when and how data was analyzed, the nature of the setting(s) in which data was collected, and how various elements of the data were weighted. To achieve credible results, one needs to strive for transparency throughout the research process. Therefore, I have elaborated on my research methods in order to enable fellow researchers to follow my research processes and form valid judgment of the results.

3.4 Ethical Considerations

Any study involving human responses should conform to pertinent principles of research ethics, among them being informed research. For the current study, informed consent has been obtained from the study's respondents by signing a consent form. A second ethical consideration for research is beneficence. For the current study, the respondents have been informed that the study is university research, aimed at gaining new insights. The third ethical consideration that researchers ought to consider is confidentiality and anonymity, which relate to how data is handled once it is collected. For the current study, the names of the respondents will not be collected to make sure that their responses remain anonymous. Verbatim accounts and descriptions of participants' experiences will only include their experiences with the program, which aid in answering the research questions at hand. In addition, it will not include identifiable experiences related to running their start-up during the program, or excerpts from unique, personal experiences that may occur before or during the program. Generic descriptions have been used wherever required. Furthermore, the recordings, which could potentially identify the respondents, were deleted immediately upon the development of transcripts.

The companies received the invitation to the interviews which contained a supplementary information letter. Information was provided on key aspects, including statement of consent for voluntary participation, as well as the opportunity to withdraw. Also included were anonymity, the purpose of the master's thesis, consent to audio recordings and a description of how the data will be processed. In order to comply with the data minimization principle, the interview data was recorded on a separate digital audio recorder and was transcribed immediately following the interview. A key, number, or name of the interviewee could not be identified. Interviews are kept as a single, encrypted file before being uploaded to NVivo for dissection and analysis.

Ethical aspects are imperative to consider whenever one is dealing with human beings. The role of the researcher is critical. This is because providing sufficient information to achieve informed consent contributes to making sure that the participant is aware of what research participation entails. Furthermore, anonymity and confidentiality are essential ethical considerations. Not taking these concerns seriously could adversely affect the participant personally, and it could ultimately lead to a bad reputation for the researchers. This would make recruitment of participants even harder. Preparation for possible issues that may arise during the interview process is key. If proper relationships with the participants are not initially established, issues may occur more easily. Although all humans do not naturally have the right chemistry with each other, it is paramount that the researcher is professional and takes responsibility. This is done by taking an empathetic and neutral stance in the interview. This is significant, because effects like social desirability, imbalance of the power relation and concerns regarding anonymity and confidentiality may arise. Also, if the researcher tends to react unnaturally (surprised, shocked, disagreeing etc.) this may directly affect what, and how much the participant is willing to share. An empathetic and neutral stance may help ease the strain and contribute to achieving the necessary information in the 60 minutes up for disposition.

4 Results

4.1 Introduction

The fourth chapter of the study contains the results of the thematic analysis of the needs assessment, semi-structured interviews and focus group data. This case study explored entrepreneurial learning in a new accelerator program for the healthcare industry in Norway. The study sought to learn more about the program, such as why the entrepreneurs joined the program, their learning styles, program advantages, and areas for improvement. In the needs assessment, responses were sorted and analyzed by hand. In addition, field notes from direct observation relevant to entrepreneurial learning are presented. NVivo12 by QSR assisted the researcher in systematically coding and analyzing the data sources from the pilot cohort interviews to identify and report the most common and meaningful perceptions and experiences of the study participants. In this chapter, the themes will be presented along with the raw data. This will demonstrate that the themes were generated from the data shared by the participants and not the researcher's perceptions. The researcher will include brief descriptions of the demographics and data analysis process. After, the results of the analysis are discussed along with the participants' actual responses during the interviews and focus group discussion. Finally, the chapter will conclude with a summary of the findings.

4.2 Needs Assessment

Ten case companies participated in the needs assessment for the accelerator program. During interviews, companies were asked what challenges they face and what they expect to gain from an accelerator program. The synthesized insights are sorted into categories and presented below.

Networking and being part of a community

The start-up companies highlighted that it is crucial to be part of a community from an early stage to get support. Communities are great venues to exchange ideas, meet new people, share resources and gain insight. Networking and talking to other peers who are at the same stage in their business ventures would provide substantial value. One company puts it this way:

> *"And it is invaluable to have someone from the outside looking in. As a general manager, I have no colleagues to colleagues with whom to spar. Sometimes I am lonely at the top. As the chairman of the*

board is also a major investor, I do not want to discuss all issues with him... It would be nice to have peers to spar with. We could have different forums with topics and group discussions. I would probably get a lot out of it."

Sharing knowledge was also highlighted by another start-up company. He highlighted how sharing knowledge and experiences can help guide and motivate cohort members, inspiring them to act:

When I´m beat and fed up, another company might say that we did this in October, then we focused on this and this to achieve our goal... - those moments, they are the very finest."

In addition, to build long-lasting relationships, the companies agreed that there should at least be a few physical meeting points during the program.

"*You may have to have something physical in the program because we are still humans. Maybe a meet-up at the start to establish contact. It is important for us to establish long-term relationships."*

Matching between the cohort company and mentor

Mentor and start-up matchmaking, based on the most pressing needs, was deemed essential by all participating companies. In addition, the mentor needs to be a hands-on, practical person who helps them get tasks done. One company believes it is crucial that the mentor integrates into the business processes. As she describes it, she is looking for a "process supervisor" who can get hands-on and get to the core issues. To achieve this, the founder would like an experienced entrepreneur as her mentor. She continued to describe it as follows:

"The mentor must dive into the processes and be a process supervisor that provides real-life training. He or she must be able to provide process guidance and concrete value-creating activities. Entrepreneurs work hard and are tired of setbacks and being stuck in the mire. Most of us entrepreneurs must borrow to the hilt in order to get the company off the ground. We have already heard all kinds of advice and guidance from experts at BI and NTNU... We do not have time for that fluffy stuff. We must have real-life training. We need mentors who know what we are struggling with and have solved similar problems. We need experienced entrepreneurs who help us take the right action."

Another company elaborated on the same matter:

"It is most useful to work on concrete tasks with a mentor, rather than having classroom lessons. I don't feel I get as much out of workshops and classes. It is very inspiring in the moment, but quickly forgotten. It is more useful to work on a specific case with the mentor, when hitting a wall or experiencing challenges. Solving problems creates calm in the team. Mentoring would be a significant asset to the program.

Two of the companies would like a mentor with broad business development competence. A third company highlighted that she wanted a mentor with extensive

experience in the medtech entrepreneurship journey. The reason for this is that the funding process in medtech is much different than in other industries. Therefore, she believed the mentor would have to be familiar with the medtech innovation process:

> *"I would not like just a doctor or a successful entrepreneur as a mentor. What I would like, is someone who knows the entrepreneurship route in medtech. In medtech, you cannot just test your products on patients right away. In addition, you must make all investments upfront and then the burden of proof is all the higher. Investors who are not involved in medtech ask about completely different things. If we had a mentor ... but I doubt that they exist in Norway. But then I would like to have a mentor who knows the process and how to raise capital, how to do clinical trials and present the business case."*

Matching with investors and decision-makers

The companies would like to be matched with investors that would suit their start-up company. All companies valued what investors could bring to the table in terms of sharing their network, propel sales and marketing and strategy development. To be matched with the right investor, the companies would like to get to know the different investors to gain insights and create a plan for fundraising:

> *"A lot is about helping and creating a race or process within fundraising. Where to start, what steps to take. Making and polishing the pitch, list investors who are relevant, following up on email and call them and then get clear answers from them that could be used to improve the presentation and our product. I would like help setting up that process. To professionalize capital raising as a process, that it is not something that you only do here and there as you operate."*

The making-of-a-shortlist and matchmaking process were mentioned by all companies. One company expressed it this way:

> *"Investors have different mandates for investing their money. It is time-consuming to research which mandate suits us. Suddenly an investor we prepared our presentation for said that he only invests in companies from Sweden, for example, which we did not realize beforehand. And some investors are only interested in patented health technology. We spend a lot of time on investors who do not suit us. We should do investor mapping and match with investors in the accelerator, then we could present to the relevant and interested investors."*

The program should culminate in a demo day where all companies present for a group of investors, and then one could have speed dating with them afterwards:

> *"In order to attract investors, we should hold a demo day at the end. Everyone needs external capital at some point. If one could have some properly defined demo days, that would have been nice. And we could also have several demo days; one for investors, and one for potential customers."*

A fourth company also highlighted the importance of presenting to and matching with decision-makers in addition to investors:

"Getting in a position to talk directly to large customers is extremely valuable. People who can make a buying decision. This can facilitate the sale process and speed it up. Meeting decision makers, speed dating them, would be greatly appreciated. That could create some fantastic opportunities. We would like to get matched with actual people who know the industry and who can open doors you hadn't quite managed to open yourself."

Knowledge transfer and team building

In general, start-up companies said they strongly recommend focusing on building the team of their respective companies in the accelerator program. According to the data, team building is an element that can boost a start-up's performance and capability for achieving learning effects in the program. To build the team, it was emphasized that knowledge transfer would have to occur during the program. One company recommended that the whole team participate in the accelerator:

"...Or else, what would happen is that I attend the program, get a lot of knowledge - but then come back to the company on Monday, and none of the others have received that knowledge, and then it will be a slowdown instead of an accelerator. Anyone with influence over decision-making processes in start-ups should be included in the accelerator. If it is to be put into operation, then the team needs to be involved. If the others do not participate in it, then the companies must have regular strategy meetings or similar processes during the course with their teams".

Flexible, digital program design

Each company expressed the need to integrate the accelerator into their daily operations. Being a founder or CEO of a start-up is hectic and all-consuming. Therefore, it would not be possible to set aside entire workdays to dedicate to the program. Instead, the companies would like shorter sessions spread throughout the week. In addition, they believed that a digital format would give them the flexibility they needed. One company articulated:

"The key word is the merging of the accelerator program with everyday life. How can it coincide with what we are doing now? If I had to set aside entire workdays for the program, I would lose my breath. The calendar is already full. We must connect the program closely to the actual activities of the start-up company, and we must have great wiggle room if any sudden changes occur. We would have to book the dates for that accelerator at least a quarter in advance. But if the day before an accelerator session I had a sales meeting that I couldn´t re-book, then I would attend the sales meeting instead. Therefore, the program should have a flexible design so that I could catch up on sessions and learning materials if I cannot attend some of the sessions. A digital format would be preferred. Flexibility is key".

Another company puts it this way:

"Time is money. It would be very difficult to set aside two days every day for eight weeks… Accelerator programs are often rigged like that. Instead, we should have skills-enhancing activities on-demand in the form of e-learning and assignments. Then it would not feel like a burden to participate in it, and we could work on the assignments when we have the time available for it".

Homework and receiving feedback

Even though the companies wanted a flexible program design, they also wanted homework with set deadlines. That would commit them to working with the content between sessions, because they would have to share the progress they had made since the last meeting:

> *"I am a fan of homework. Because then it commits. Talking about lots of things and meeting again later never works. We should have something to deliver at the end. It can be as simple as linking homework to my goals. For example, if my goal is to land a high-profile VC investor, I will report on the progress I have made on that since the last meeting. Or that we will work on our presentations before the next session, improving them according to the feedback we have received. Then you must work through it, and afterwards we will receive relevant feedback from health industry professionals."*

Another company talks about their experience with an online course, where they learnt a lot due to the flexible design and regular assignments:

> *"It was an insanely well-structured course. We constantly had tasks to solve. We had to deliver assignments regularly, and at the same time, we could have a look at what others were delivering. It resulted in very effective learning. We had to put our homework up on an open platform, where everyone could access it. We shared progress that was made and experiences. It was incredibly fun and structure-based in a way. I would also like collaboration in a similar way, it really helps prioritize program tasks. If you fail to deliver, you fall behind, right? There were short video modules as well, but most of the time we worked on our assignments."*

Thorough testing of the product solution

All companies highlighted the need to set up a pilot test of their product. They would like feedback from model customers and decision-makers.

> *"We need a test lab. For instance, it could be done in collaboration with research centers. I would like to conduct clinical trials on our intervention. Document the effect and in that way get a stamp of quality on it."*

In addition, they were all interested in conducting cost-benefit analyses based on the testing, and advice on how to set prices for their products and services. The cost-benefit analysis could then be used in investor presentations and in negotiations with customers. In the words of one company:

> *"I would like a value stream analysis around cost-benefit. One needs to pinpoint the actual savings that occur when our solution is used, but also the societal gains. Arranging for these kinds of measurements would be highly valued. My goal is to test the product with health professionals, end-users, and municipalities. How do you calculate benefits, and at what end do you calculate? That would have been very insightful. In addition, pricing is difficult, and it would help to gain more knowledge of how other companies set prices for their products."*

In such a cost-benefit analysis, the companies were keen on measuring the life quality gains of their product:

> *"Many times, I have wanted to make such an analysis, because we can argue for many variables, but we do not have the actual data, since we do not have the expertise to make a cost-benefit analysis. We*

talk about creating pleasant moments, joys, bringing back memories for patients… But we cannot measure this in numbers, so it would have been exciting to do just that."

The start-ups were interested in fostering mutual understanding between the public sector and the start-up companies in the cohort. Several of the companies voiced that they would like to know how the municipalities think when making decisions. They believed the municipalities would benefit from the discussion as well. One company suggested a co-creator accelerator program design, where the municipalities and/or hospitals are part of the program and give feedback on their product solutions through testing:

> *"The municipality must voice their needs: what are the municipality's interests? An accelerator could serve as a catalyst to facilitate quality communication between the municipality or hospital and the start-up - making everyone understand each other on both sides. Is it an innovation we are planning to do together, a development process, or is it a sale we are doing? These are all different processes. I think it is critical to involve municipalities in the program, and that they test our products. If the program could have an intermediary function, where the goal would be to scale up, clear up misunderstandings... It is imperative that both parties are present at the same accelerator - to make it a co-creation accelerator. There should also be a knowledgeable supervisor available that both parties have confidence in, believe in the competence of. This person should facilitate the discussion and take it step by step."*

4.3 Interviews

4.3.1 Demographics

Five entrepreneurs participated in the semi-structured interviews and focus group discussion (hereafter: FGD). These participants have firsthand knowledge and experience of the newly launched accelerator program for the healthcare industry in Norway. These participants were asked to participate in the study as their direct experiences could provide unique insights into the current research. Three of the participants were female, and two were male in the actual study. I refer to participant 1-3 as female, and participant 4-5 as male – this is a randomized attribution of the correct distribution of gender pronouns, to anonymize the actual genders of the participants.

4.3.2 Data Analysis

The thematic analysis of the study was conducted to determine the most meaningful experiences of the participants. A total of six steps were applied, and NVivo12 by QSR helped identify significant themes that provide unique understandings of the phenomenon being explored. Three thematic categories and several major, minor, and subthemes were

generated through the thematic analysis. Thematic categories were formed to provide a better and more complete view of themes, grouping them based on essential subjects and focuses. Major themes are the most significant findings of the study, ones with the greatest number of participant references from the analysis. The other vital themes are known as the minor themes of the study; these themes have fewer participant references than the major themes. Finally, subthemes were also included to provide examples and detailed information about the parent themes, or the major and minor themes as needed. In the next section, only the themes with more than 50% of participant references will be discussed in detail. Themes with limited references are found in their respective tables. Further research is recommended to solidify their trustworthiness. Table 2 shows the number of themes per data source and thematic category.

Table 2: Breakdown of the number of study themes

Sources	Thematic Category	Number of Major Themes	Number of Minor Themes	Number of Subthemes	Total
Interviews	TC1	1	4	0	5
	TC2	1	2	1	4
	TC3	1	7	1	9
FGD	TC1	0	5	0	5
Total	-	3	18	2	23

4.3.3 Presentation of Findings

Following the number of themes, the researcher will discuss the findings of the thematic analysis. In the interviews, it was uncovered that the main reason for joining the EIRAccelerator was to build networks and connections within the healthcare industry. As for learning styles, all participants preferred a collaborative style of learning where they were open to learning from the experiences of others. Meanwhile, all participants noted that the program was beneficial in building their motivation and confidence, given their past and present experiences as entrepreneurs. The focus group discussion (FGD) data had five minor themes. However, two of the most referenced themes pertained to the recommendations of building tailored and specific networks based on the company and having accessible speakers or support representatives. Table 3 contains the breakdown of the actual themes; in the following sections, the themes will be discussed in more detail.

Table 3: Breakdown of the study themes

Sources	Thematic Category	Themes	Number of References	Number of Participants
Interviews	TC1. Reasons for Joining the Accelerator Program	Building networks and connections in the healthcare industry	3	3
		Finding it crucial for the company during the time that they joined the program	2	2
		Being able to have a jumpstart and to pilot the company	2	2
		Having a laboratory tailored to the company	2	1
		Wanting to be part of a centralized process	1	1
	TC2. Learning Styles	Collaborating with one another *Being open to learning from others*	12	5
		Learning and being stronger from past experiences	9	3
		Preferring a hands-on or actual learning	1	1
	TC3. Helpfulness of the Program	Building motivation and confidence from the experience	11	5
		Confirming rightness of process through the laboratory	7	4
		Gaining useful networks and contacts	9	3
		Structuring the professionalization of the business model *Gaining investors*	6	3
		Being open to changes and continuous improvements	3	3
		Gathering diverse perspectives	3	2
		Requesting for actual feedback from program assignments	3	1
		Learning from the stakeholder panel	1	1
FGD	TC1. Program Improvement	Building tailored and specific networks based on company	6	1
		Having accessible speakers or support representatives	4	1
		Having initial meetings	1	1
		Receiving feedback and follow-up from the assignments	1	1
		Inviting past members to future programs and conferences	1	1

4.3.3.1 Semi-structured Interviews

A total of five participants were interviewed for the research study. The interviews were crucial in providing a deeper understanding of the reasons for joining and the overall meaning of the program for entrepreneurs. Most participants highlighted that they joined the program with the hope of creating networks and connections in the healthcare industry. All the interviewed participants reported a preference for a collaborative learning style as they shared how the experiences of others in the program have helped them greatly. Finally, all participants acknowledged that the program enhanced their motivation and confidence as

entrepreneurs. Again, minor themes followed the major themes, and only those with a significant number of participant references will be presented in detail. Table 4 contains the complete breakdown of the themes from the interviews.

Table 4: Breakdown of themes from the interview data

Source	Thematic Category	Themes	Number of References	Number of Participants
Interviews	TC1. Reasons for Joining the Accelerator Program	Building networks and connections in the healthcare industry	3	3
		Finding it crucial for the company during the time that they joined the program	2	2
		Being able to have a jumpstart and to pilot the company	2	2
		Having a laboratory tailored to the company	2	1
		Wanting to be part of a centralized process	1	1
	TC2. Learning Styles	Collaborating with one another *Being open to learning from others*	12	5
		Learning and being stronger from past experiences	9	3
		Preferring a hands-on or actual learning	1	1
	TC3. Helpfulness of the Program	Building motivation and confidence from the experience	11	5
		Confirming rightness of process through the laboratory	7	4
		Gaining useful networks and contacts	9	3
		Structuring the professionalization of the business model *Gaining investors*	6	3
		Being open to changes and continuous improvements	3	3
		Gathering diverse perspectives	3	2
		Requesting for actual feedback from program assignments	3	1
		Learning from the stakeholder panel	1	1

Thematic Category 1: Reasons for Joining the Accelerator Program. The first thematic category pertains to participants' reasons for enrolling in the program. The analysis revealed the value of networks and connections for participants. Another set of participants joined the program as they found it highly relevant for their company´s further development. Two participants added that they wanted to jumpstart and pilot the company. The two other minor themes of having a laboratory tailored to the company and wanting to be part of a centralized process received limited references. They may need further research to increase their credibility.

Major Theme 1: Building networks and connections in the healthcare industry. The study's first major theme identified three participants' desire to build beneficial networks and relationships across the healthcare industry. These participants found the program's target of healthcare firms and companies to be a key element of their decision to join. According to Participant 1, it was crucial for her to be with the right group or network. She also described the program's features as "beneficial," saying:

> *".... Because the program is targeted at healthcare companies. You must have a relevant network to connect. You have a lab, and it is tailored and over a longer period of time. And plus, you only have healthcare companies. Therefore, you can form networks with them. I think it is beneficial."*

As for Participant 3, she was focused on forging strategic partnerships with the other stakeholders of the healthcare industry. Given their lack of capital at that time, this participant believed that the program would be vital to helping them pilot and start, stating:

> *"I was really looking forward to being part of shaping an accelerator for the healthcare industry. We wanted partnership. And then there was capital, which we don't have. So, our goal was to pilot. And we did that in parallel with the program. And then there was the matter of having... some strategic partners."*

Lastly, Participant 4 noted how being part of a more extensive network within the healthcare industry was an objective for him. The participant explained why, narrating the following during the interview:

> *"My personal goal was to build a stronger network within the health sector, because I come from the private sector, and to raise money, which we are currently in the process of doing... I would say the contact network is perhaps the most relevant."*

Under the first thematic category, the primary reasons for joining the EIRAccelerator were discussed. As presented, most of the participants had the desire to create and explore broader connections that could help them expand their businesses further. As start-up businesses, these founders believed that a targeted network would be of significant benefit to them.

Thematic Category 2: Learning Styles. The second thematic category that emerged discussed the learning styles of the study participants. According to all the participants, a collaborative learning style was the most efficient strategy for them. At the same time, participants also acknowledged how they learned and became stronger from past experiences. Finally, one of the participants stated that she preferred hands-on or action learning.

Major Theme 2: Collaborating with one another. The second major theme of the study pertains to the collaborative learning style of all five participants. For them, they learn better from the lessons and experiences shared by others or those part of the program. However, they also reiterated that for this learning style to work, participants must be open

and willing to learn from and listen to others. Participant 1 used social practice and engagement learning styles in the accelerator program. For Participant 1, getting advice and guidance from experts in the field is essential. This participant narrated how their openness to one another as members of the program guided them in the process of starting and building their company, saying:

> "Get expert advice where you can. I learned from others right from the start. If you wonder about something and you think there is someone who has done it before you, maybe done something similar or maybe really messed up, seek out those people and wonder either how they did it or learn from what they did wrong."

> "I also share my mistakes with others. Yes, that's really how ... the community works, that you ... yes. And now we also have an even broader community after this program. Like, for example... then it might happen that: "Oh, I think we should send the same application as them." Yes, but then I just contact him, and then I hear: "What have you done? How did you write it? Who wrote with you?" If they remember. But somehow the more people you meet, and the more people you have who can help, the more likely it is that things will work out well."

Similarly, Participant 2 added that as founders in the same situation and condition, she learned much from the experiences of others. She was able to relate to their challenges and experiences. She applied the action orientation and experience dimension of learning in the accelerator program. The participant explained:

> "When you are in a program like this, you are with other founders who are also in the same situation and who have also been selected to participate, and you learn from them. You know in a way that you are not alone out there and that there are others who also have the same challenges. So, my ability to stand in it is better. You get a better ability to stand in it... I feel the freedom to get in contact if the need arises."

> "I learn best by doing, because it's one thing to listen to someone say something about something in general. You learn something from that of course, but it's not until you sit down and do it yourself that you really learn."

Participant 3 echoed how she "learns best" from others. This participant noted how by listening to the experiences of others and common questions that they have, she also gains knowledge as a founder. She applied a mix of reflection on the previous experiences of others, the nature of questions other participants asked, and feedback provided by others on different business scenarios and phenomena concerning the participant's respective business model. The participant pointed out during the interview:

> "I learn best by learning from others. To hear what others have experienced or to ask questions... Mm. It is only in the lab that I have received feedback and that I, in a way... I am very open to feedback. You learn from feedback. I would like to have feedback on tasks performed, so that I can improve."

As for Participant 4, he illustrated that he had different learning styles. He used a combination of action orientation, reflection on experience, and social practice and social engagement learning styles. However, he highlighted during the interview that discussions with others and watching or observing their practices had been the most notable for him. The participant narrated:

> "I probably learn best by combining watching, listening, and doing. So, if it's just seeing and hearing, then it often becomes... you have to do, I think, then, do some of what you're doing in such a way that you do it in practice, because otherwise you might not get to put it into practice."

> "There were quite a few tasks. There was a lot where I thought about reflection... when you do tasks you get to reflect quite a bit. I think that is very helpful. And then we did a number of joint tasks together. This is also very useful because you get to discuss a bit with others, so that was also quite helpful."

> "At presentations, I think I have learned a bit from the others. To see what they do, and which network they use, how ... yes, how have they raised money or what have they applied for in terms of funding? Yes, there are many things actually."

Finally, Participant 5 reiterated that learning "is best experienced with others." This statement pointed to the development of learning from one's constant interaction and communication with the rest of the stakeholders. This participant tapped the self-efficacy learning dimension for the accelerator program. In this style, the participant established the perspective of a mutual relationship between cause and effect among personal characteristics and factors within the environment as well as one's behavior.

> "Learning for me is best experienced together with others, so that there is a group to learn with. Of course, it is also a combination of self-effort and involving those you work with to a greater or lesser extent. But for me, learning and development is always based on interaction with others."

The second major theme that followed emphasized the importance of collaboration as a way of learning and improving the competence of entrepreneurs. According to them, learning is most effective when shared and experienced with peers with the same goals and backgrounds. Furthermore, they also noted how feedback from others is vital to their personal development.

Minor Theme 1: Learning and being stronger from past experiences. The first minor theme identified the participants' learnings from their past mistakes and experiences as entrepreneurs. The three participants explained that one's expertise and diverse experiences could create a sense of safety and security for business founders. Based on the interview with Participant 1, there is indeed an increased sense of security gained from one's knowledge and competence in their chosen field of business. The participant narrated:

> *"No, it's probably a general sense of security, because the more expertise you gain in a field, the safer you feel. I also have a board of directors that I work with, who are also such great sparring partners. There are many of the processes that have taken place in the last eight months perhaps, which have been very beneficial for the company."*

Meanwhile, Participant 5 explained his learning process as continuously growing and evolving. According to this participant, one must recognize opportunities to learn and maximize past experiences to understand and improve oneself. The participant pointed out during the interview that:

> *"No, that is, all the background and everything that I have from the past gives, or at least has given for me, continuous motivation to learn more about new things. And then, in the jobs I've had, I've mostly been allowed to get involved, or become involved in relation to getting involved and being given trust, and being assigned responsibility for tasks, new tasks and things I did not know. It is in and of itself extremely positive to have that experience with me, and I hope that I will take that experience and background into opportunity and learn something. So, it's really just filling up, and filling up positively as I experience it, and that... so I, then, just add another to that experience, that it has also been an exclusively positive learning process."*

The second minor theme pointed to the value of using past experiences as lessons to improve and not repeat the same mistakes as entrepreneurs. The interviewed participants believed that mistakes and previous errors must be taken positively and maximized to their advantage. The participants explained that past mistakes are part of a natural learning process.

Thematic Category 3: Helpfulness of the Program. The third thematic category discussed the helpfulness or benefits of the program to its participants. From the analysis, the researcher found that the program has been vital in building the motivation and confidence of the participants. Four participants added that the program also confirmed the rightness of the process through laboratory assessment. Three participants identified the advantages of gaining valuable networks and contacts, structuring the professionalization of the business model, and becoming more open to changes and continuous improvements. Two participants added how they successfully gathered diverse perspectives, and another two requested actual feedback from program assignments to ensure their growth and development moving forward.

Major Theme 3: Building motivation and confidence from the experience. The third major theme of the study identified the program's positive impact on participants' motivation and confidence levels. For all five interviewed participants, the program helps its participants not only build but also sustain the level of motivation and confidence they have as founders of start-up businesses. For Participant 1, the program has been crucial in increasing her

motivation, noting how the program's environment has played a significant role in the process, saying:

> "Being in a program like that helps to keep motivation up. So, I would say that it was very beneficial to be in the program in terms of motivation, so it has helped to keep motivation up, I must say that. And I would like to believe that if we had not been part of the program, the motivation would probably have been lower now. It is so important to take part in programs like this or similar, or incubators, because you have to be part of such a start-up environment."

> "It is helpful for motivation, learning, synergies, and so on. So yes, motivation would have been lower if we weren't involved. We... you are completely dependent on being part of one environment or another."

Meanwhile, Participant 2 connected her increased motivation and confidence to the speech of one of the many speakers. This speaker explained the need for start-up entrepreneurs to uplift themselves and think globally despite their issues and difficulties. The participant stated:

> "Yes, I'm better than I was, as I've learned a lot of things I didn't know. You don't always realize that you have that lesson with you, but it's there. I would say that, and perhaps especially the ability to lift yourself up and get a bit of a helicopter view and think a bit bigger. It was perhaps especially the speaker on the investor piece, I don't think everything he said is true, but he was very much about lifting you up and looking a little further, thinking a little bigger."

Participant 3 described the program's impact on herself uniquely, noting how she has become more confident and open to many practices that she would not have thought of before. The participant stated:

> ".... I have become ruder. Not rude, but I'm just...No, I'm breaking the rules. I'm breaking the rules of the road. I go straight to those I need to contact, without using the formal channels or going through others. Right, so it's ... so then I've really just started going ... violating the driving rules and simply doing what I am required to do at this time. So, I may have become a bit ruder. What shall I say? I grew some balls."

Furthermore, Participant 4 elaborated on the aspects and areas provided by the program, which were also the factors that increased and developed his motivation and confidence as a founder. The participant narrated during the interview:

> "The ambitions are probably... at least as high as they were before the program. And we had high ambitions beforehand, but maybe they are a little higher even. Confidence, yes, ambitions have certainly increased a bit along the way. You have somehow received confirmation of what you are doing. It has been... yes, then the confidence increases... I think I'm more motivated. I think that... a bit here that we've got this network, got an even larger group of supporters that wants us to succeed, I think it gives increased motivation."

Finally, Participant 5 noted how the program had increased his levels of ambition, knowledge, and competence. According to him, the program has positively influenced him as

a start-up entrepreneur. He also highlighted the need to value the learning process of the program, saying:

> *"It has definitely increased the level of ambition, and I would also like to believe... you can see that through the program, that what we have been through here now means that I will obviously be able to be both a better contributor among those who have a similar level of competence, but even greater contributors are perhaps those who started at the same level as we did, and will know both mechanisms, and prerequisites, and tools to be able to work efficiently and purposefully, and be very both confident and comfortable that the tools we have been given, and the experiences we have gained are valid and hold water ... and I think so too ... what has been positive in the program, you can also validate or confirm that, because they have also run presentations for investors who are in the market, who work in this market, who are looking for companies and start-ups... you don't get anything for free, because it has been a mutual learning process."*

Following the previous finding that participants acquired various lessons, practices, and values from the program, most participants also highlighted how they have since developed much motivation and confidence as entrepreneurs. The unique experience gave them the tools they needed to pilot their businesses and sustain them going forward.

Minor Theme 1: Confirming rightness of process through the laboratory. The first minor theme was the program's effectiveness in developing and confirming the companies' product innovations through the Norwegian Smart Care Lab (NSCL). According to the participants, the program helped them evaluate, confirm, and validate the state of their respective products. For Participant 1, the program was crucial in determining the strengths and weaknesses of their solution in the laboratory. The participant also highlighted how this aspect of the program could be considered a milestone for a start-up founder like her, saying:

> *"And we got... it was a lot of fun, because it turned out as well as it could have, in terms of getting confirmation that it is so user-friendly, so understandable, and that it... they also think... well, it was so cool to hear the reasoning. That is, why they did what they did. And that is absolutely right, in relation to what is the idea behind the product. It was such a strong confirmation that we were definitely on the right track. They understand how to use it. And they needed almost no training to understand that, and that's probably one of the most helpful things that we got out of it as well. It's very simple training, you hardly need to... it's almost... we hardly had any mistakes made on that test. So, there was hardly a single mistake. The only thing was that someone was thinking a bit about how to update something in the dashboard. But compared to the iOS app, it was 100 %. So, it's just like... no, it was just so much fun just watching. I just like: "You did exactly as I predicted you would do."*
>
> > *It succeeded beyond all expectations, so ... it was a positive confirmation that we had done a lot right. And then it is also a test in relation to the investment course. Because it is an important milestone."*

Participant 3 echoed Participant 1's experience, identifying the laboratory evaluation as a significant achievement for their company. The participant narrated:

> "The lab was very well structured. It was awesome. It was structured, I felt that I was taken seriously, I got feedback. It was professional. Dates were set... and deadlines. I presented the pitch, then I got feedback that this had to be changed and so and so, and then I sent them a new pitch. Then I got some feedback on it. There was a sense that I was taken seriously there.
>
> We got feedback from it and got a report that we use now. And we use the pitch that I did at the stakeholder panel. It ticked off a milestone for us. This is to say that I could say that we have now tested it with the stakeholder panel, and then we found out that, from the stakeholder panel, that they would have adopted the solution if it had come through the occupational health service and insurance."

Participant 4 said that the positive experience with the lab allowed his team to set up their business idea in a systematic manner, allowing them room to test the practicability of their business idea in a controlled environment:

> "Been a bit more systematic like that or at least had more capacity to do things systematically, so it's been very, very helpful and in a way got someone who has challenged ... yes, maybe you can do it that way instead of that way. I think that if we had run that test alone, for example, we would have taken in probably 50 pilot customers, now we only had 10. And it is really very fortunate that we did not have more. So, there is quite a bit of experience that we have been allowed to gain through the Lab which has been very, very good, which has made it easier to complete the test."

Participant 5 said the experience was very valuable since it allowed him to pinpoint the target market group. This facilitated the customization of their product to meet the taste and preferences of this group. Further, this participant found the experience beneficial, for it facilitated his team to set up realistic business goals and missions after a serious cost-benefit analysis of the service the group was offering in the market:

> "...Yes, our product changed both before the program and based on lab testing, we carried out during the program. We were able to pinpoint a target group who felt that there was a significant deficiency in the product when we approached the consumer market. A lab test has also been carried out as part of the program where we have had a dialogue both related to the application and the scope of the existing project. We also wanted views from the two environments from which the workshop participants were recruited from on future development of the service and the concept."

The participants' examples above demonstrate how the program provided them with the opportunity to test and improve their product solutions, business equipment and infrastructure. The participants noted how the other program stakeholders' expertise and networks were valuable in confirming their own product solutions' usability and effectiveness.

Minor Theme 2: Gaining useful networks and contacts. The second minor theme again relates to the desire to have networks and connections in the healthcare industry. This minor theme confirmed how the program provided a more significant opportunity for the founders by providing them with relevant associations and partnerships. Participant 1 offered several examples of how being open to communication and collaboration helps in making the process much easier and manageable for the start-up founders, saying:

> *"No, in that sense, I know quite a few people in the start-up industry, and then I just reached out and said: "Dude, can't we have a coffee?" And then we have a coffee, and then of course you learn a lot. More like that... what have you done in terms of production components? Who did you collaborate with? After all, there was one that turned out completely wrong. What was their name again? And then I talked to him too, because he knew that story. Then it was like: "What went wrong there?" Because then we want to make sure we don't end up in the same situation."*

Participant 4 elaborated on how he gained a larger network of connections. Along with the network, he also received more help and guidance in the process, saying:

> *"In any case, I have gained a larger network. And got a little more curious about some of the other start-ups, and also a lot of humility towards the program in general. It is my opinion that the program is outstanding and that I received a lot of assistance from there. Push and help, it has been very positive."*

The second minor theme was previously described in the first thematic category. The emergence of this theme as a minor theme highlights the value of networks and connections for participants and the program itself. According to the participants, building targeted networks for guidance and support is crucial, given that they are still starting in the healthcare industry.

Minor Theme 3: Structuring the professionalization of the business model. The third minor theme discussed the creation of a more formal and professional business model through the program. The participants who mentioned the theme described how the program guided them through the more complex and difficult aspect of their business. Participant 2 described how the program can provide targeted knowledge and information about particular business concepts and information that are difficult to access and comprehend. The participant also shared an example where:

> *"The professionalization of the business model and concept was particularly useful. I think that if you don't have anything, if you just have an idea, it's difficult to be part of an accelerator, I think. You must be quite specific about what you will deliver to whom, and what service you will provide. It doesn't have to be completely clear, but it must be fairly clear. What you can get help with is how you can go to market, how you can talk to investors and structure materials, investor pitches, and messages. We learned a lot about that part. Both the gatherings and all these tasks we did were very organized.*

Our mapping of what the board needs was really good, and yesterday at the general assembly, we were appointed a new board that encompasses everything, so we have been able to take the map straight into board work and strategy work. So, it was very useful. And it also applies to the fact that you may be able to think together with the rest of the gang about clever things, but if you don't get it down to a structure, it is difficult to see mistakes as well. You don't see typos until you've written something. It really helps to visualize it."

Meanwhile, Participant 4 elaborated how the program gives start-up founders access to networks and organizations that could solidify the foundation of the business. In this case, the Directorate of Health, saying:

"One thing that I have gained through, indirectly through the program, is that I have taken part in something called... a pilot project called Safer Health Apps. And there we got... as the first company to get approval as a Safe Health App through the Directorate of Health, it has been very positive. Yes, so it happened in March. So, it's good, it's positive.

Yes, maybe that's what has come out of being in the program, so I think maybe that... has been the most significant thing for us, then. To receive such a stamp of quality from the Directorate of Health has been golden.

The good thing about being part of it is that you get quite a lot of help, and it was also special that it was within health, which made us want to be part of it. That was really what was decisive.

Maybe a bit on the regulatory side of it too... but it's not on target yet either, but a bit on the regulatory side, so we've got some help along the way. Yes, it may have been a bit on the side of the program, but it has been through these people, that I got help with regulatory issues"

With the limited background of the participants in the healthcare industry before joining the program, the information about business models and standards assisted them in formalizing their businesses further. According to the participants, the knowledge and expertise of the program stakeholders were crucial for them as new entrepreneurs.

Minor Theme 4: Being open to changes and continuous improvements. The fourth minor theme of the third thematic category discussed the value of being open to changes and innovation. For the participants, they believed that for businesses to evolve, stakeholders must learn to accept the ever-changing business environment or in this case, the healthcare industry. Participant 1 explained that the process gets better over time, but founders must also realize the value of openness to learning in order to grow and develop, saying:

"I have ... we change the pitch all the time. You also do that with the board. I kind of think like this: "Yes, it always gets better", and the more input you get, the better it gets. So yes, I get better. And it's more... that is, you learn from others how they do things. It is a continuous process, so yes, there is always potential for improvement. "

Meanwhile, Participant 5 commented on the following during the interview:

"The speaker has definitely identified areas that are critical to focus on in relation to future issues and in relation to growth and scaling. Of course, it is extremely important for us to work with in the future to maximize the value of the company and also the potential that we can realize by using the money for further development of competence."

The final minor theme of the third thematic category discussed the importance of being open and willing to accept innovation and other changes within the industry. According to the participants, change is a continuous process and is already inevitable. Hence, owners must be open and willing to accept change to succeed and sustain their businesses.

4.3.3.2 Focus Group Discussion

The third set of data was focus group discussion with the participants. According to the FGD, the most common suggestion for improving the program was to offer participants tailored and specific networks based on their company. Another theme with four references was the request to have more accessible and approachable speakers who could provide participants with constant support throughout the program. The three other minor themes are found in Table 5 below.

Table 5: Breakdown of themes from the focus group discussion data

Source	Thematic Category	Themes	Number of References	Number of Participants
FGD	TC1. Program Improvement	Building tailored and specific networks based on company	6	1
		Having accessible speakers or support representatives	4	1
		Having initial meetings	1	1
		Receiving feedback and follow-up from the assignments	1	1
		Inviting past members to future programs and conferences	1	1

Minor Theme 1: Building tailored and specific networks based on company. The first minor theme generated from the analysis of the FGD data was the call of the participants for the program to become more personalized and target networks for each company. As they see it, it would be very helpful if the program took the time and effort to match and group the participants and speakers based on their backgrounds and company context. As one participant referenced during the discussion,

"Hooking it up to something that is so beneficial for the company is very worthwhile. Then we can meet some investors or make something around it. Then it is easy to set aside time for it for the vast majority of people. Then you get a whole lot of possibilities."

Additionally, another participant noted that there was a mismatch between one of the speakers and participants in the program. The participant explained that for the participants to better understand and relate to the speakers, better profiling must be performed:

> *"I think the tools and the speaker who talked about investors were relevant. He had a lot of helpful things to offer. But I could think of saying hello to someone else too. It became a bit of a typical company that speeds from 0-100 in three seconds, a sports car company that was... and that doesn't exist in health. There is a slightly later acceleration for healthcare companies. It was a bit like that. There was a bit of a mismatch all the time, and I think others felt the same. You felt a bit guilty because you were so late."*

According to another participant, the correct grouping of participants would make the experience of an alumni network much more relevant and effective, saying:

> *"And I think the story needs to be updated not to die. Participating in an alumni network must make sense, it must be relevant, and that is difficult to achieve. You have to have something that is connected not only to those who have been lucky enough to be part of the program, but also to other start-up companies, then it becomes even more relevant."*

Finally, another participant explained how the proper grouping of participants and speakers would create a much more open and collaborative atmosphere, narrating the following:

> *"I think it's nice to be able to collaborate with more people, but I believe you also have to have something fixed that you work on, then you have a much greater opportunity to ask questions. If I had worked with one of the participants, I could ask him or her much more specific questions, where they are heading and what they are doing and where the shoe is pressing, and then I can more easily challenge them on what they are doing. "Have you thought about this?" Then it will be like having a mentor in the mentoring scheme. Although it is nice to collaborate with several people, because then you can replace them along the way. I think it's valuable to have someone who follows you more closely, because it adds quite a bit of value when someone has enough history to ask the right questions."*

The first minor theme from the FGD was related to the previous themes discussing the value of networks and connections. Despite the program's success in creating networks and relationships, most participants felt that key speakers' and other representatives' expertise and suitability should be assessed prior to participating in the program. For them, it would be helpful to pair or group the participants with speakers with the same background and experiences.

Minor Theme 2: Having accessible speakers or support representatives. Aside from the proper grouping and segmenting of stakeholders, participants also called for the speakers and support representatives to become more accessible to participants. For one participant,

> *"It would have been nice if, while you are dealing with those questions, there is someone who thinks that we have someone like that speaker who comes by and talks to us while we are dealing with the*

case. It's nice to work on it together but having someone come in and participate in the discussion would have been nice."

Another participant pointed out the value and impact of having readily available and accessible support representatives who can assist the participants and provide feedback as requested. However, this participant had an issue with using an imaginary company in group assignments, limiting personalized experience in the program. The participant narrated:

"It would be valuable to be able to use your own case. This allows you to dive deep and receive feedback from others. If you actively use someone's case, I have the opportunity to follow him or her over time. That's what I thought would have been useful then. In the same way that someone else can follow me up on my case. Because it becomes very close, becomes real, and you can ask real questions, and you get the real challenges that arise along the way. It would have been very useful if everyone could bring up their case in a group as well, so that you could receive that feedback. And that's what I think would have been exciting, it's like being able to follow the other companies, because some of what others experience, I will at one point or another also experience as challenging and vice versa, so I think that you could gain even more experience and get even more out of it by having such real cases."

The second minor theme is interrelated to the previously discussed minor themes. According to the participants, it is essential to have targeted speakers who are approachable and readily available for their concerns and issues. It would be more effective for them to quickly reach out and seek feedback and improvement during the program.

4.4 Direct Observation

The researcher participated in the accelerator program as a direct observer. Based on my observations, I developed interview guides for the semi-structured interviews and the focus group discussion that followed. Over the course of the program, I assessed the participants' progress and attempted to identify when learning occurred.

The participants appeared to be interested, enthusiastic, and eager to learn. It was evident that a positive and inclusive atmosphere prevailed in the group, where each member encouraged the other to do better by sharing their experiences and offering advice. At the end of each module and inspirational workshop participants asked questions to the speaker about how to avoid common pitfalls. In order to avoid making the same mistakes, they were interested in learning from other people's mistakes. The Business Development Manager, who is the program director, moderated the discussion and ensured that everyone had the opportunity to ask questions and establish meaningful contacts. To help participants get clear

and helpful answers to their questions, she sometimes rephrased their questions in a language familiar to the different presenters.

Miro, a visual collaboration platform for teams, was used throughout the program for both individual and group tasks. In advance, several templates were uploaded, and a map depicting the various steps the companies would take in the coming weeks was drawn. The speakers were interested in demonstrating models and explaining their use. Participants were asked direct questions such as "what do you see here?" and "what do you think this model is useful for?" This encouraged participants to be active in the lecture sessions and develop an understanding of what areas to focus on in the models when they would be using them later in group assignments.

In case some participants were unable to attend parts of the program, presentations by speakers and inspirational workshops were recorded. Therefore, all participants had the opportunity to review the material, which they found beneficial to their learning.

Module 1: Market and customers

During this first module, participants had only met digitally a few times. Upon asking if there were any questions after the presenter finished, no one responded, and the program director was ready to move on. Then, after some additional time, a participant raises her hand to ask a question. The delay in asking questions is not observed in subsequent modules; participants become more comfortable from the second module onwards and express their questions as soon as possible.

Participants were eager to hear a presenter in this module, a representative from a leading supplier of IT infrastructure in the Nordic region, tell how they work with start-up companies. It was an eye-opening experience for them to learn what is expected of them and what tasks the IT supplier handles when cooperating with start-ups. Later, participants used this information to improve their preparation and communication when landing new partners and expanding their networks.

A participant did not receive a satisfactory answer to his question. The program director assisted in gaining an answer by translating the question into a more clear and concise form. The presenter also discussed pricing models with participants. In addition to sharing experiences and asking questions, all participants participated in the discussion. The first delivery was due the week following the first module. Due to a lack of time, some participants were unable to finish their assignment in time for delivery.

Module 2: Product and business model

This module began with participants sharing their recent progress. The majority of them had updated their investor presentations and had scheduled investor meetings. There were some who had begun rigging their pilots for the test lab, and their accelerator mentor had assisted and motivated them. One participant reported last week that they received helpful guidance on approaching a new contact during a mentoring session. A third participant said it was helpful to determine the right focus and strategy for her board. A fourth participant had won a competition for investor presentations, which she connected to the work she had already been doing at EIRAccelerator. By focusing and practicing effectively communicating the message and values of her start-ups, she said she had improved her communication skills. By doing this, she was able to condense her company's story into five minutes. By winning the competition, she also expanded her network, as investors approached her afterwards for a chat. The program director congratulated her and said people now understand what she is doing, which is a significant achievement.

I found this module to be well designed. During one session, four speakers presented in succession. During the virtual Q&A sessions that followed the presentations in this module, participants discussed how they had handled similar challenges. In addition to sharing their experiences and providing recommendations, they also sought expert advice from the speaker, for example regarding pricing and cost-benefit analyses. Each member of the group took part in the conversation between the speaker and cohort participants, and there was a natural flow to the conversation. It was evident from the facial expressions of the participants that they gained new insights regarding this topic as a result of the discussion. Speakers offered words of encouragement to cohort members at the conclusion of the sessions.

Module 3: Team, culture and board

During this section, a recruitment agency shared its experiences providing candidates for start-up companies seeking to expand their teams. Discussions were held regarding what values job seekers look for, including that the company has a clearly defined commitment to social responsibility and sustainability. Furthermore, they discussed how to recruit board members and salary models, including options. It was noted that many participants signed up for free consultations with the speakers following this session.

Module 4: Raising capital and internationalization

Participants were required to present their strategies for building global growth during this module. Each presentation was followed by a question-and-answer period with questions from fellow cohort members and the speaker. The cohort participants discussed their plans and requested feedback from the group. Apart from the speaker providing feedback on the work presented, fellow cohort members were eager to learn how the other start-up company participants arrived at their conclusions and to provide their own advice. Responding to the speaker's expert advice on what participants should not do, other participants shared their experiences of having done exactly that. They also shared that it had not worked out well, recommending an alternative approach.

In this section, the speaker asked thought-provoking questions, such as "what was the challenge in this task, what provided insight?", "did you discover any shortcomings?" and "what do you want to accomplish?" It appeared that the purpose of this exercise was to stimulate participants to think and arrive at the core of what their current challenges are. According to participant feedback, they became more specific about what they needed to accomplish to reach certain growth milestones when working with the templates provided. The idea of plotting all the details into a single template makes it easier to organize information. This helped participants gain a helicopter view of their start-up companies. Having heard numerous investor presentations in the past as an investor himself, the speaker provided helpful advice on how to create an effective investor presentation.

This module provided participants with the opportunity to meet virtually with national and international investors and ask them questions about what they are seeking. Investors shared their most valuable advice and what motivates them to invest, and several insightful discussions were held in the cohort group. Moreover, participants shared their own strategies, including how they developed their short lists of investors, to help one another. There was a recurring theme regarding clinical studies and the regulatory race in health technology to obtain necessary approvals, which participants noted can take a minimum of 2-3 years and deter investors. They coined this the "go-to-market-delay" for health-tech companies and sought advice on how to address this issue in investor presentations since investors cannot expect to make an exit in the first few years due to this delay. The investor concluded that regulatory processes are the same for everyone involved in health technology; if that deters the investor, it may indicate that the investor does not have sufficient knowledge of the health industry. This speaker encouraged participants to seek out international investors, who have

the necessary knowledge of the process of developing health-tech companies. These investors can provide value development as well as capital.

Inspirational workshops

Successful health-tech entrepreneurs and global pioneers in medtech shared their experiences in inspirational workshops. Each of these workshops was scheduled following the completion of each module. It was noted by participants that these sessions provided an excellent opportunity for them to ask questions and establish new relationships. The speakers discussed different approaches to launching products in municipalities and market entry, including try-before-you-buy sales models. In addition, speakers discussed how they worked on regulatory matters and mapped their markets as well as their experiences with diverse pricing models. A major focus of their presentations was how they developed funding strategies and internationalization strategies, as well as their experiences with investors.

It was a valuable experience for participants to gain insight into the experiences of their fellow health-tech entrepreneurs, allowing them to gain motivation to accomplish their own goals. The speakers shared specific advice on how to succeed in the health-tech industry. In their presentations, speakers discussed how they overcame obstacles, formed innovation partnerships, provided contact information for people who assisted them, and described what roles they believe are essential on a health-tech start-up team. Throughout the workshop, they discussed their journeys from the concept stage to the final product, and shared advice on building a winning culture, assessing cost-benefit, and finding your niche.

4.5 Summary

The fourth chapter of this study contained the results from the needs assessment prior to the accelerator program, results from direct observation of the EIRAccelerator, as well as the themes established from the semi-structured interviews and the focus group with the five study participants. Results from the needs assessment and direct observation were organized into different sections by topic. Thematic analysis was applied and NVivo12 assisted the researcher in organizing and determining the hierarchy of themes from the two interview sources of data. With the analysis, the semi-structured interviews had 18 themes and the focus group discussion resulted in five themes.

All the participants joined the accelerator program intending to make their product solution a commercial success by increasing its profitability and bringing it to market. In the

accelerator program, participants used a variety of learning dimensions and styles, including learning from social practice and engagement, action orientation and experience, learning from mistakes, crises, and failure, as well as enhancing self-efficacy and intentionality. Further, all participants agreed that the accelerator program benefited them in various ways based on the primary requirements of their individual business needs. The most beneficial aspects of the program were getting feedback and inputs from other participants, mentors, investors and speakers. They also enjoyed expertise and views from other participants, gaining capital to expand the businesses, gaining a broad perspective on the value chain and alliances, and accessing customer markets. Three of the five participants said their backgrounds influenced how they experienced the program, while all said they enjoyed their experience with the lab. They said the lab was fun and educational and was an eye opener. Participants cited limited time, much work, the impression that one of the speakers ran the show, and the use of imaginary companies instead of actual ones as the key situations that threw them out of their comfort zones. However, they all had ways to mitigate the effects of these situations.

Four participants found it very useful to participate in the program's cohort. Also, the participants described the group dynamics as positive since it presented a platform to share among themselves and learn from each other. A digital format was described as beneficial since it made contact and collaboration easy. Still, participants felt they could have benefited more if the program had included some physical sessions. After attending the accelerator program, participants felt more motivated to pursue their business ideas.

In the final chapter, the researcher will discuss the research questions in detail in relation to the presented findings and the literature reviewed in Chapter 2. The researcher will also present recommendations, implications, and conclusions based on the findings of the thesis.

5 Empirical Analysis and Discussion

Entrepreneurs, particularly those operating small and medium-sized businesses, are hesitant to adopt knowledge that is not aligned with their experiences (Nogueira, 2019). There is a growing focus on gaining knowledge through experiences in order to influence making appropriate decisions for the success of a venture. Entrepreneurs with a high rate of success tend to be individuals who are keen to draw insights from experiences made based on their actions, possess a knack for obtaining knowledge from their experiences, and a willingness to adjust their behavior based on the accumulated knowledge (Pittaway & Cope, 2007a; Pittaway et al., 2011). The primary objective of this master's thesis is to further develop the theory of what promotes entrepreneurial learning in accelerator programs. An abductive case study with a longitudinal design was conducted on the EIRAccelerator, an accelerator program offered by the Norwegian Smart Care Cluster for start-ups in the healthcare industry. The contents of this chapter include interpretation of findings in light of the research questions, limitations of the study, recommendations for future research, and implications for theory, for practice, and for positive social change. Pittaway's seven entrepreneurial learning dimensions will be used to structure the discussion of the first two research questions of this study.

5.1 What Impact Do Entrepreneurs' Present and Past Experiences Have on the Experiential Learning Process?

5.1.1 Action-Orientation and Experience

When participants were asked about their preferred learning style, they highlighted that learning by doing and collaborating with others are the most effective learning methods. Entrepreneurs are known to acquire knowledge through action, are open to learning experiences, and are oriented toward learning through action (Pittaway et al., 2011). This answer can also be related to the learning dimension of acquiring knowledge through social practice and social engagement. The participants appreciated that the program was action-oriented and noted that knowledge is useless unless it can be put into practice. The action dimension was particularly visible when the companies were in the lab, a practical part of the program. One participant pointed out that he combined the senses in the learning process by combining watching, listening, and executing. All agreed that they had gained more than they expected from the program's hands-on approach. This observation was in line with the

observations of Jones (2009) who had posited that entrepreneurs tend to be action-oriented individuals.

Another participant stated that homework encourages one to maintain performance over time. He said that he learnt by doing and testing things for himself in practice. This allowed him to try things in many ways. "Doing" was the most effective type of training for him. This is consistent with conventional wisdom that business owners are action-oriented individuals whose primary method of learning is to gain tacit information and "learning maps" through practical application (Dalley and Hamilton, 2000; Rae, 2000; Rae and Carswell, 2000; Jones, 2009). He further added that interaction with others and interactive learning from others have been exploited as a part of the accelerator program. Participants elaborated on the value of being part of a cohort and learning from others. Homework, the viewpoints of other members and discussions help in developing more diverse perspectives. All these responses were in line with the observations presented by Pittaway et al. (2011) who had stated that effective entrepreneurial learners tend to be individuals who prefer action and a capacity to obtain knowledge and alter their behavior accordingly. On the other hand, direct observation revealed that not all participants followed up on their homework. This was attributed to time constraints. Additionally, some participants decided to focus on a few templates that they felt would be most useful for them to work with. As far as learning is concerned, this seems to be a helpful strategy. It is possible, however, that the pressure to complete homework may not be as intense when the program is digital.

Through the focus group discussion, it was discovered that prior experience and background motivate participants to learn new skills. Positive replenishment in skillsets and thoughts was beneficial. Previous experience affects what participants can gain from the program. The participants had different backgrounds: some were founders of their start-up company, others were CEOs. Among them were health professionals, serial entrepreneurs, and business development professionals. Diverse backgrounds in the cohort also helped in learning from each other´s experiences as well as understanding the various challenges that a start-up would have or can encounter in the future. This is in line with research by Crossan (1999), stating that entrepreneurial intuition is future-oriented, as opposed to expert intuition, which may be past-pattern-based. Entrepreneurial intuition encourages discovery, whereas expert intuition encourages exploitation (Crossan, 1999). Effective entrepreneurial learners are those that prefer acting, can pick up knowledge as they proceed, and can alter their behavior (Gartner, 1988). The participants established linkages between the newly acquired

learning material and past experiences, as well as identifying and acting on previously unidentified possibilities. One participant noted that it would have been chaotic to participate in the accelerator in their first start-up year and compared the linking process to chains connecting: *"(...) and then a small piece of chain is added, which... it kind of fits in a bit in relation to what you´ve learned before, it´s often how I feel. "We have room for that right here". That I have so much background knowledge, and if you come with a slightly new angle and a slightly different type of food for thought, then: "oh, yes, but it fits right here""*

5.1.2 Mistakes, Crises and Failure

Accelerator participants reported positive experiences with the program. Interacting with the group was convenient. Presentations and experiences were shared without fear of judgement within the cohort. The climate in the group was reported as overall positive. An interesting point that was raised by many was that they would have liked to use themselves and their own companies in the tasks. That way they could have given feedback on what they have done and what they are doing at present. In addition, it would have created more room for sharing. One participant stated that "*If we had spent at least a bit more time going through what the different people had done, then we could have learned even more from each other. Instead of discussing a problem that neither of us owned about a product, I think we should spend a bit more time on that".* The participants agreed that it would have been more useful to fill out templates and solve tasks in groups with their own companies as cases. Being able to use your own case allows you to dive deep and get feedback from others. The company and situation are relatable which allows a better understanding of the concept. It would have been very useful if everyone had brought their case to the group as well so that everyone could get feedback.

Pittaway et al. (2011) posited that knowledge obtained from failures could often expedite a successful entrepreneurial re-emergence. Entrepreneurs who have previously failed may benefit from the lessons learned in other contexts when handling other key events. It was helpful for participants to share their experiences with one another in order to avoid repeating common mistakes. They noted that as founders in the same phase, they learned much from the experiences of others and was able to relate to their challenges and experiences. One participant noted how learning from other´s mistakes, and sharing her own experiences with other entrepreneurs, increased learning. Thus, the link between the first two dimensions of entrepreneurial learning is that through an orientation for action, entrepreneurs obtain experiences which can either be positive or negative. The negative experiences are equally valuable as the positive ones, providing plenty of actionable insights invaluable for an

entrepreneur in future endeavors. The relevance of the failures is that owing to the high level of uncertainty in the field of entrepreneurship, failures tend to be more prevalent, which means learning from failure is both a reality and a necessity in entrepreneurship (Politis, 2008). Through negative experiences, entrepreneurs can draw lessons they can apply in the future to boost their chances of success.

Reflection on past mistakes and failures allowed the participants to relate to current situations quickly. However, if you are a newcomer, it may be more difficult to be a part of the conversation. Working on cases from their own companies followed by scenarios around them would have facilitated them to grow from mistakes and failures in a better manner. This would have allowed them to have a better sense of the different solutions that might have been available. Lattacher & Wdowiak (2020) discussed the entrepreneurial tendency to learn from crises and their own mistakes. Nonetheless, there has been a definite emphasis on learning from failures and how to navigate through crises. However, things would have been better understood if the case had been relatable. Although it wasn't expressed as clearly in words, if we combine body language, emotions, and the underlying tone of the responses in the focus group discussion, it became clear that all respondents agreed that knowledge gained from failure is essential to a successful entrepreneurial reemergence, which Politis (2008) elaborated on in her work.

The dynamics of entrepreneurial learning involve concepts of discontinuity, metamorphosis, and change. It does not show consistency, stability or predictability. As part of the program, the participants were exposed to a cohort group consisting of individuals with different personalities and experiences as entrepreneurs. Additionally, they met industry professionals and successful health technology entrepreneurs, who shared their founding stories and lessons learned. By reflecting on one's actions and observations of learning gained from experience and meta-observations the individual can shift their underlying references (DeFillipi, 2001). In line with this, several participants noted that participation in the accelerator program improved their understanding of what role they would like to play in their start-up. As a result, many of the participants changed their role during the program. It became apparent to one participant that she had achieved what she wanted to in her role in the start-up, and it was time to move on to new challenges outside of it. This can be characterized as a critical incident. Cope and Watts (2000) reported that critical incidents can help increase self-awareness. Therefore, reflection on one´s one role can also be linked to the seventh component of self-efficacy, as noted by Pittaway et al. (2011).

The transformative learning process of people through critical incidents, as noted by Pittaway et al. (2011) and Cope and Watts (2000), has also been supported by Clarysse and Moray (2004). Critical incidents or shocks usually occur in a business, and the team members of the business develop alongside the shocks, aiding in its development. Clarysse and Moray conducted a longitudinal and qualitative study where the researchers wanted to know "why" and "how" teams in start-up ventures affect the performance of that venture as well as its growth. They found that team members kept evolving regarding their activities and their relationships with each other. They referred to this process as an internal reorganization that took place because of external shocks. For example, the researchers noted that shocks were the main motivation for one of the start-ups to seek a CEO with experience. As time passes, the team members realize that founders cannot always be considered business managers, and this can only be learned through the process of learning by doing (Clarysse & Moray, 2004). In this regard, the findings of Clarysse and Moray (2004) again align with the findings and the first component of Pittaway et al. (2011), as both are of the view that learning by doing has an intricate relation to learning by mistakes.

5.1.3 Reflection on Experience

Reflection on experience is an essential part of the entrepreneurial journey. This is because situations and challenges are unpredictable, the only guiding principle being the learning and experiences that you have had in your life. A successful accelerator program stimulates the mind and gives a chance to reflect on past experiences. Group tasks have certainly given participants a chance to all reflect on their experiences and arrive at a solution that can be optimum based on past experiences. Through personal reflection, the entrepreneur draws lessons that prove vital for future decision-making (Politis & Gabrielsson, 2009; Politis, 2005).

The program's challenges were manageable for participants since many had already attended other accelerator programs. One of the participants stated that: "*I've been through this strategy tool and stuff before, and I've sort of been through it two or three times before, but even though I've sort of been through it before, you learn something every time, and you get to reflect again and that is also always useful.*" Participants felt that they had become better entrepreneurs by putting their past experiences to use. The statement is in line with the argument made by Kolb (1984), who suggested a four-stage learning model. It isn't always obvious that one has encountered a situation before or has the necessary skillset to handle it. Only when things happen and you begin thinking about previous experiences and prior learnings, do the dots start getting

connected and the picture emerges. Working in groups, regular discussions and reflection of the past are the most critical aspects of navigating through unforeseen challenges. This aspect of learning from experience is in line with the learnings of Pittaway et al. (2011), who states that reflective entrepreneurs are the most effective learners. The participants were reflective practitioners as they learned through an ongoing process of action and reflection. The experiences the start-ups went through in and outside of the program became meaningful when they thought about and reflected upon them.

Reflection was incorporated into the program. All sessions began with a recap of the previous session's learnings and experiences. According to Cope (2003), reflection following an experience is vital since it allows one to develop concepts and ideas about developing a more entrenched comprehension of a phenomenon. As presented by Lattacher & Wdowiak (2020), there is a consensus among scholars and experts in the field of learning that the most-effective approach to learning is one based on a person's experiences, whereby an individual goes through an experience and reflects upon what they have experienced. On the other hand, it was unanimously agreed by all participants that they would have appreciated more detailed feedback regarding their assignments and completions during the program. Furthermore, they would have preferred speakers to be more accessible. In the workshop, one company stated: *"While we were working on the assignments, they could have stopped by the breakout rooms and chatted with us. Participate in the group discussion."* In observing the companies performing group tasks, I recognize that they would have been more productive had they been given the opportunity to reach out, ask questions, and receive feedback on how they had completed the tasks. According to research, technology-based ventures need to identify and build productive learning processes that enable them to interpret the strategic environment and incorporate this understanding into new products, services and processes (El-Awad, 2017). This is in line with Edmondson (1999) who stated that learning is as a dynamic, multilevel process which largely depends on the individual's ability to ask questions, seek feedback, experiment and reflect on results and unexpected outcomes.

Digital meetings with mentors provided entrepreneurs with the opportunity to reflect during the program. Based on Mills et al. (2012), a mentee's confidence in their own ability to recognize opportunities increases as they learn with a mentor; the mentor shapes the way an entrepreneur thinks, as well as assisting entrepreneurs in moving forward by overcoming their lack of experience. While e-mentoring has been proven beneficial, its success is anchored in several supporting factors (Mills et al., 2012). It is essential that companies

receiving mentoring set clear objectives. Other factors include the development of appropriate structures, communication tools, and assessments. A KTH mapping was undertaken at the beginning of the accelerator program, which identified areas for improvement to be addressed during the program for each company. Despite this, it was reported that companies only accessed these areas indirectly. Microsoft Teams were used for the mentoring sessions due to COVID-19 restrictions, which provided participants with flexibility and provided an effective learning environment. Mentors have stimulated reflective learning (Cope 2005b) by discussing the challenges entrepreneurs face in their start-ups and introducing them to relevant industry professionals who can assist them further, providing them with guidance and support. Empirical evidence indicates that this was of particular concern to the founders, which is consistent with the work of Cope and Watts (2000).

5.2 What Are the Mechanisms by Which Entrepreneurial Learning Processes Are Activated in Accelerator Programs?

5.2.1 Opportunities and Problem-Solving

An imperative concept in entrepreneurial learning is how to identify opportunities and improve problem solving (Minniti & Bygrave, 2001). This concept cannot be taught in theory only; practical experience is necessary. Once a participant shares his case and the solution around it, he not only reinforces the concept and adds practical value to it but is also taken as a go-to person for related problems and issues (Pittaway et al., 2011). My direct observations indicate that the program lacked a clear approach to improve learning on this dimension. No evidence has been found that founders are better able to spot opportunities as a result of participating in the accelerator program. Rather, through practice, the founders have become more adept at acting, expanding networks, and exploiting them as members of a larger community.

This learning dimension requires demonstration of planning, structuring, and using systematic tools for problem solving. Empirical evidence does not indicate whether participants have improved their problem-solving skills. The accelerator program has, however, provided them with practical tools to assist them in planning and structuring internal processes within their start-up. These tools have helped them to organize, develop and professionalize their business model. The importance of planning should not be

overlooked. Entrepreneurs usually work from a plan in their heads, and they may find it challenging to guide their business partners and show them the bigger picture. An accelerator program like EIRAccelerator that pushes its participants to work more on established plans and milestones enables entrepreneurs to become better at planning, executing, and telling the story of their innovation.

Each company designed a pilot test of their product solution in the lab and received feedback, applying planning tools to structure the process. The NSCL segment of the accelerator program was highly regarded. Experts, industry professionals, investors and mentors provided invaluable advice. It did not always confirm the companies' hypotheses, but it helped them to learn as the outcomes and initial suppositions implied could be compared and gave them new insights into their product solutions' strengths and areas for improvement (Meittinen, 2000). Companies commented that if they did not already have extensive experience designing tests of this type, they would not have been able to design their pilot test as well as they did. This feedback can be linked back to the observations of Ucbasaran et al. (2003) who stressed the importance of experience in identifying opportunities and utilizing them for profit. In order to improve the product solutions further, I suggest that the lab conducts cost-benefit analyses. On the one hand, there were very few companies that I interviewed that were concerned about cost-benefit analysis, but rather with human values - safety and predictability - in addition to being able to replace manual tasks with reliable, valuable, and verified digital solutions. In the pilot test, the companies sought to ensure that technical data and that the actual parameters collected were accurate, precise, and understandable. In addition, it was critical to them that the product solution worked as intended and could be used by health professionals. The companies all agreed that the time saving analysis was useful. When I asked directly if they would have liked to consider the savings for potential customers, all agreed that it would be useful for both future sales processes and investor presentations.

5.2.2 Uncertainty, Ambiguity and Emotional Exposure

Time constraints in the program caused stress for several participants. The accelerator program took a lot of time and effort to complete. The case companies reported that ideally, they would have liked to have had more time to work on program content. At times, there was a potential priority conflict since the course was running alongside normal business functions. Participants suggested limiting the number of tasks one focuses on to reduce

perceived stress. A common denominator in participants' answers was that although some aspects stressed them, such as lacking time, there was generally little that was described as stressful. In addition, few events were able to throw the founders out of their comfort zone. Based on the results of the study, the researcher suggests that stress experiences are influenced by both personal characteristics and accumulated entrepreneurial experience.

As the researcher observes, the participants did not comprehend the underlying learning intended for this portion of the program. Even though all of them agreed that the short time frame was a source of stress, no one ever considered the fact that real-life business situations never provide enough time for you to react in a well-thought-out and diligently planned manner. Gibb & Hannon (2007) explain the importance of understanding emotional exposure in entrepreneurial life and how this should not interfere with the decision-making process. One of the key aspects of the program is to ensure sustainability for the participants during such situations (Cope, 2003). During the daily operations of their start-ups, each of these entrepreneurs is pressed for time, and it is during this shortage of time that they all need to make critical decisions that can give direction to their business. When they were probed further into this direction, some of them did mention the speakers who touched upon these qualities. However, overall, it appears the program design needs to be more focused and illustrative of this learning dimension.

Through direct observation of the participants' task solution sessions, I associate the duration of the accelerator program with increased learning outcomes. Due to the limited duration, entrepreneurs were forced to make critical decisions and act on key tasks. This observation supports the findings of Pittaway and Cope (2007b) and Cope (2005) and can be related to time compression economics (Hallen et al., 2014). The theory holds that time pressure leads to better performance. Participants noted a sense of progress and efficiency due to the limited duration. Participants in the EIRAccelerator benefited from time compression, which affected their learning and effectively "shortens the journey of start-ups, resulting in either quicker growth or quicker failure" (Pauwels et al., 2016). Data shows that the accelerator program with its limited duration improved the learning process of participants.

According to Pittaway (2005), entrepreneurship is an innately uncertain undertaking permeated by risks, which means that entrepreneurship is often understood from the perspective of uncertainty. De Cock et al. (2020) hold the view of entrepreneurship as an ambiguous and unpredictable undertaking. Similarly, Grégoire et al. (2015) posit that

entrepreneurs often face emotional cues more frequently and with more intensity than individuals in other professions. In this regard, accelerator programs are no exception. Throughout the program, entrepreneurs are exposed to various situations where they will gain new experiences and insights. Entrepreneurs reported that they were missing more feedback on their tasks. The uncertainty dimension provides a different perspective on the issue. In this regard, providing entrepreneurs with less feedback can expose them to uncertainty. This is because they must determine for themselves which direction to go in for tasks that may have an impact on the outcome. It is often possible to find more than one solution to a business case, and this can therefore prove to be a valuable learning experience.

On an emotional level, the lessons on obtaining investors were cited as one of the most impactful parts of the program. One of the reasons for this was the approach the speaker took to how to present the material. An "American approach" to securing funding was presented by the speaker, who stressed the importance of going big or staying at home. At first, participants were startled by this very non-Norwegian approach. It was evident, however, that following some sessions, most participants felt motivated to make a greater effort in securing funding - primarily by attracting the largest, most reputable investors. One participant described the result of being inspired to think bigger as follows: *"You must dare to ask for more than what you had imagined. Now we think more long-term. (...) and we are even tougher about how much money we have to raise."*

This method of pushing limits can, however, have either a positive or negative effect on learning. It was noted by some participants that this approach was not aligned with the reality of securing funding in health-tech, which is a long and difficult process for most start-up companies. In addition, another participant felt that she did not want to contribute more to the sessions due to the speaker´s approach. Though emotions have been documented to have a positive effect on entrepreneurial ventures, there is a growing body of knowledge that posits that extreme or poorly timed emotions, as well as severe fluctuations in emotions, tend to hurt entrepreneurial outcomes (Baron et al., 2012; Uy et al., 2017). That then brings up the need for effective emotional management as a precursor to success in one's professional undertakings, particularly the success of ventures. In that regard, it could be an improvement of the program to incorporate more time for reflection and feedback on lectures throughout the accelerator program in order to enhance learning.

Morris et al. (2011) presents the entrepreneur as an actor in a journey or a mountaineer climbing an endless peak. They portray learning as not being restricted to the

venture. Decision-making is likely to be impacted as the entrepreneur learns more about himself or herself, including their comfort level with ambiguity, risk tolerance, capacity for stress, and need for control (Morris et al., 2011, citing Bandura, 1986). All entrepreneurs in the accelerator program described themselves as risk-seekers before the program. As a result of the program, their risk tolerance had further grown. This was attributed to an increased motivation and ambition level as a result of having gained more knowledge. This also resulted in enhanced confidence in their abilities.

5.2.3 Social Practice and Social Engagement

A health-tech accelerator program provides entrepreneurs with the opportunity to establish their social networks and learn about the business practices of other start-up companies. Several of the cohort participants pointed out that sharing is key in order to learn from each other. It was apparent that the participants wished there had been more opportunities for sharing. In addition, privacy concerns were raised. Despite signing a non-disclosure agreement, there seemed to be a lack of trust among the participants concerning the sharing of information specific to their own companies and cases. Direct observation led me to believe that participants preferred to keep some information to themselves. In addition, one participant felt that the program lacked clear and open communication. This participant did not feel understood and respected. The other four participants, on the other hand, agreed that the dynamics of the group were favorable. Some of the specific comments from the participants were: *"There was positive group dynamics. But as I said, there was not much room for sharing. There should have been a bit more time. And then there were some who perhaps took up a little too much space for sharing their knowledge. And then of course it was, I think we would have had an even better learning outcome if we had one or two physical meetings. But we know that it was not possible because of covid. I think one of the group meetings should have been physical. When you have met someone physically, the dynamic is different than when you have only met them on Teams. It would probably have led to more sharing, knowing each other better."*

According to my observations, I believe that peer-to-peer learning is most effective when the cohort group is homogenous. As a result, companies can collaborate on group tasks and give each other advice in a more comprehensive manner. In accordance with research, accelerators that cater to a specific market segment provide the greatest value to cohort companies by offering highly tailored services (Hytti & Mäki, 2007). Participants in this accelerator program pointed out that some of them had come a longer way than others. This meant that they were not all in the same phase, even though that was the intention when

screening applicants. In addition, for peer-learning to be successful, and for companies to be motivated to share their challenges and learning needs, it is imperative to aspire to avoid competition issues between businesses to build a safe environment for sharing and collaborating (Hamilton, 2010). Companies participating in an accelerator program should not offer competing product solutions. If that is the case, there is the potential for a sense of competition among participants, which may adversely affect the learning process (Mills et al., 2012). By observing the companies in the cohort, I noticed that some participants had similar product solutions. This may have contributed to them holding back information. Although participants reported successful peer-to-peer learning, they could have learned more if the products they offered were even more distinct from each other. This supports the findings of Hytti and Mäki (2007). Additionally, they may have felt more comfortable sharing more in the groups if they had met in person at the beginning of the program.

All companies in the EIRAccelerator were early-growth companies in health-tech. Cohort companies were eager to expand their network in the health sector. In all cases, it was cited as one of the primary reasons for joining the program. Their objective was to network with other health-tech companies, experienced entrepreneurs, industry professionals, and investors. All participants agreed that they have expanded their network within the health industry. Participants reported positive learning effects from mentor meetings throughout the program, as well as from meeting industry professionals, presenters and investors. As a result, they believe that they have established a large network that will be beneficial to them in the future. On the other hand, participants differed when it came to the cohort's ability to accelerate learning. Although most participants believed they gained knowledge from each other, one participant felt that she did not get any learning effects from being part of a cohort. It is possible, however, that they did not recognize the implicit learning that was taking place. All the sessions I observed were characterized by sharing, collaboration, and discussion.

Vicarious learning (Bandura, 1977) is the process of learning indirectly from those around you. For vicarious learning to take place, knowledge transfer must occur (Argote & Ingram, 2000; Argote & Miron-Spektor (2011)). Knowledge transfer is a significant aspect of social learning. The transfer of knowledge must be continuous and seamless. Indeed, according to Taylor & Thorpe (2004), knowledge transfer, an integral component of entrepreneurial learning, often features an informal social dynamic, which allows the subject to emerge rarely as an individual, but as a collective of enablers of different levels and caliber. In this accelerator program, one representative from each start-up company attended.

Upon completion of the accelerator program, participants will be required to transfer what they have learned to the other members of their teams. When asked about this aspect in interviews, companies reported that they had already reflected on this. Among the criteria for joining the accelerator program was the ability to extract and apply the methodology, approach and ways of working to the start-up company - otherwise, they could have read a book or carried out self-study. One participant said: *"Knowledge transfer, in my opinion, is continuous. What we have learned permeates what we do and the way we act."* Another participant, however, stated that participation by the entire team at their start-up would have resulted in more profound learning effects. Participants reported that how to establish a winning culture was not sufficiently addressed in the program. A greater emphasis should have been placed on building a strong team and developing a positive and inspiring work environment in their start-ups. In addition, this is reflected in my field notes for the third module, with the theme of "team, culture and board", which are more concise than those from other modules.

5.2.4 Self-efficacy and Intentionality

Entrepreneurship education has been shown to be positively associated with the entrepreneurial intention of participants (Luthje & Franke, 2003; Pittaway & Cope, 2007a). Bandura (1997), one of the main proponents of the social learning theory, asserts that self-efficacy is a belief in one's capability to organize and execute the relevant courses of action needed to produce a certain outcome. Self-efficacy, which reflects one's faith in one's abilities, is a form of self-assessment that impacts one's determination to overcome obstacles and to make decisions relating to activities to be undertaken (Hsu & Chiu, 2004). Hence, self-efficacy comprises beliefs about one's competency, which impacts work, and beliefs about activities that, when performed successfully, will yield certain desirable outcomes. Programs should increase motivation levels and instill self-belief in participants. These two aspects are significant for any entrepreneur to steer through the toughest times. As a result of the program, the individuals were expected to improve on both traits.

After the program, several of the participants reported increased motivation and belief. The underlying basis of the question was the inference from Pittaway et al. (2011) which stated that entrepreneurs gain experience with the success and failure in their business, and this has a direct impact on their confidence. Respondents were more confident that their company would succeed after the program. Being part of an environment with the same goals provided increased motivation and support. After attending the program, they felt that the

probability of their success was greater. The confirmations and encouragement they have received from the lab, and from fellow participants, have given them a feeling of motivation and an increase in self-confidence. To illustrate, one of the participants mentioned that he feels he has slightly higher self-esteem and is more ambitious after the program. He says that the reason for this is that he has become more confident in his abilities. This is because he has learned more and talked to others in the same situation. Because of this increased confidence and self-belief, individuals now feel that they are better at structuring and planning activities. The participant also felt that the learning that the program has provided is not related to the health industry. Instead, it is universal in nature and can be extended to any sector.

Participants have reported that they have become more aware of their own role. After the program, several participants have changed their role, turning it more towards what they enjoy doing and what gives them energy and inspiration. In one case, a participant was inspired to shift his focus to product development and human resource management, which he considers to be more fulfilling. He further added: *"My level of ambition is to get our product out into the world. I've philosophized about this in the past, and I think it's wise for the company to have a CEO who enjoys being out in the world, or someone with international experience and co-tech experience, and then I can get back to all the other things that I enjoy. I like talking to clients and investors. It is not like that. But I think we should have had a ... I think I have enough self-awareness to see that it's not my dream job. It's more about stitching things together and making things and people work. So, it probably happened during the program, if not only because of the program. "*

This dimension aligns with other dimensions of entrepreneurial learning. For instance, the common understanding, as detailed by Pittaway et al. (2011), is that entrepreneurs obtain experience, particularly when they experience success or learn from their failures. Furthermore, these factors enhance their confidence which fuels their tendency to take risks, a pivotal part of entrepreneurship. Additionally, this dimension relates to social practice and engagement, where, as determined by Linksvayer & Janssen (2008), intentionality features a distinctive social context. Moreover, high levels of intentionality and self-efficacy are vital in helping an entrepreneur navigate the uncertainty and ambiguity that permeates the entrepreneurial landscape.

5.3 What Should a Virtual Accelerator Program Provide for Entrepreneurial Learning to Occur?

This subchapter provides a detailed discussion of the findings of this study in relation to establishing a model of entrepreneurial learning in a digital business accelerator program. It includes four learning dimensions and five essential components. Combining the feedback of the participants along with the limitations and shortcomings of the existing program, a revised and improved accelerator program framework has been proposed. The insights from the needs assessment were used to design the essential components of the program model. The insights from the cohort interviews and direct observations were used to design the learning dimensions.

5.3.1 Proposed Framework for Entrepreneurial Learning

My model for entrepreneurial learning in a digital accelerator program is comprised of four dimensions. Two of the major themes, "collaborating with one another" and "building motivation and confidence from experience" are incorporated into the model. In addition, the minor theme "learning and being stronger from past experiences" is included. Scholars in the literature reviewed for this study have highlighted the importance of experiences for entrepreneurs (Linksvayer & Janssen, 2008; Pittaway et al, 2011). Specifically, experiences are gained when people and organizations learn from their past failures (Pittaway et al, 2011). This has inspired the dimension "hands-on action learning" in my framework.

In light of the insights I gained during my study, this framework represents a further development of the framework by Pittaway et al. (2011). In order to achieve this, I reshaped some of the dimensions. While some components have been collapsed, others are considered overarching. I refer to Pittaway's "action-orientation and experience" as my "hands-on action learning" dimension. Pittaway's "social practice and social engagement" are reframed as my "team learning" dimension. There is a weakness in Pittaway's framework in that it neglects to emphasize the role of networks. My research indicates that learning in teams and building connections within an industry are key components of entrepreneurial learning. Due to this, I have named one dimension "team learning" in order to exclusively emphasize this component.

My dimension "building motivation" is inspired by Pittaway's dimension "self-efficacy and intentionality". In order to build motivation, "social practice and social engagement" and "action-orientation and experience" are essential components. As a result of

peer learning, entrepreneurs gain strength from their past and present experiences, which contributes to their motivation.
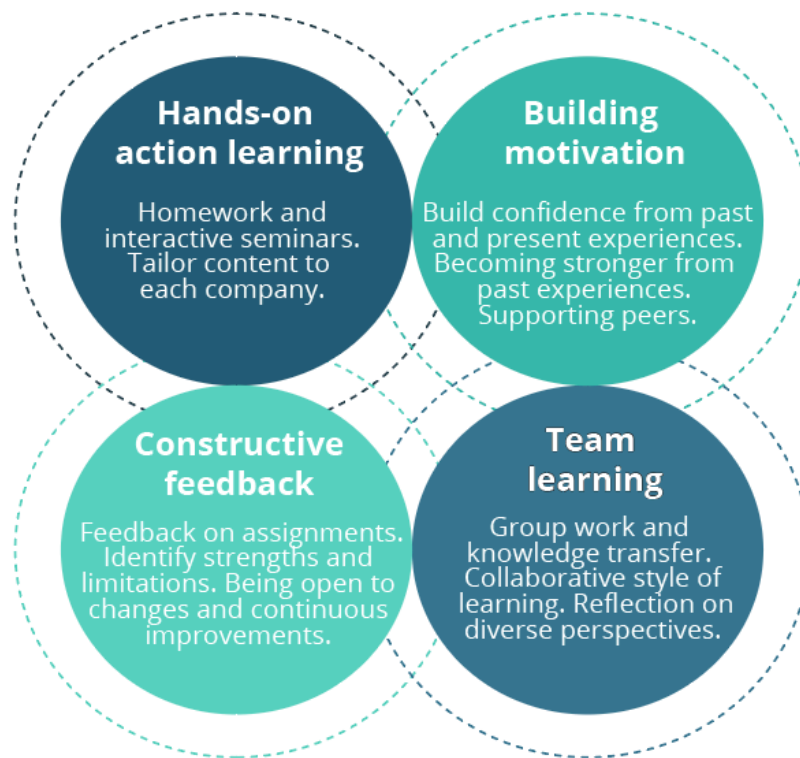
Figure 7: Learning dimensions in a digital accelerator program.

The entrepreneur is inspired to reflect by receiving constructive feedback from peers, mentors, investors, and industry professionals. Therefore, "constructive feedback" is my fourth dimension, which I believe is crucial for Pittaway's dimension "reflection on experience" to occur. "Team learning" is also an invaluable component of facilitating reflection. Additionally, I believe my dimension "constructive feedback" supports "building motivation" because a start-up will receive feedback and help with resolving problems they face. Consequently, Pittaway's "mistakes, crises, and failures" are handled through constructive feedback, which also helps to identify "opportunities and problem solving" by acting through "hands-on action learning".

I believe that some program cohorts, but not all, experience Pittaway's learning dimension "uncertainty, ambiguity and emotional exposure" during an accelerator program. Nonetheless, it is essential for entrepreneurs to engage in "team learning" and receive

"constructive feedback" as a means of helping in the process of "building motivation" as well as resulting in the required actions being taken through the process of "hands-on action learning".

Hands-on Action Learning

Entrepreneurs with a high rate of success tend to be individuals who are keen to draw insights from experiences made based on their actions, possess a knack for obtaining knowledge from their experiences, and a willingness to adjust their behavior based on the skills and knowledge they have acquired (Pittaway & Cope, 2007b; Pittaway et al., 2011). Thus, action orientation is a pivotal enabler of entrepreneurial learning since it makes it possible for an entrepreneur to learn from his or her actions. Those experiences provide actionable insights, which are invaluable in future decision-making for increased success in one's entrepreneurial undertakings.

The relevance of experience as a source of high-level insights for entrepreneurs is highlighted by Dalley & Hamilton (2000). They posit that entrepreneurs, particularly those operating small businesses, are hesitant to adopt knowledge that is not aligned with their experiences. As such, there is a growing focus on the entrenchment of knowledge that is effective in influencing the making of appropriate decisions for the success of a venture. This knowledge can only be gained through experience. On that basis, as presented by Jones (2009), there has been a shift, particularly in entrepreneurial education, towards providing space for learners to interact with core entrepreneurial ideas in a manner that resonates with them.

Building Motivation

This dimension is inspired by the third major theme from my study, building motivation and confidence from experience. Motivation is an imperative aspect of success for entrepreneurs (Naktiyok et al., 2009; Mishra & Zachary, 2014). From the data, the participants expressed that the program helped them not only build but also sustain the level of motivation and confidence they have as founders of start-up businesses. Based on the mentoring model of Mills et al. (2012), peer-learning networks help learners develop self-confidence in addressing internal issues in their start-ups. Furthermore, according to Pittaway et al. (2011), as entrepreneurs gain experience and acquire knowledge, their levels of confidence to act on issues increase.

109 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
P r o g r a m   f o r   t h e   H e a l t h c a r e   I n d u s t r y :   A   C a s e   S t u d y   o f
E I R A c c e l e r a t o r

More recently, Funken et al. (2018) and Boso et al. (2019) studied transformative learning through mistakes and failures. They noted that transformative learning takes place, but it has positive effects only on entrepreneurs with a positive attitude towards mistakes and errors. On the other hand, entrepreneurs with a negative attitude towards mistakes and errors could be harmed by failures and problems (Funken et al., 2018). In this regard, one of the previously published studies by Politis and Gabrielsson (2009) also showed that entrepreneurs' attitudes regarding failure-related experiences have a considerable role in experiential learning. Politis and Gabrielsson (2009) conducted their study utilizing experiential learning theory to know the factors or reasons that could be associated with the development of a positive attitude towards failure among entrepreneurs. They conducted a questionnaire survey and extracted information from the data obtained through surveys filled in by Swedish entrepreneurs. The researchers found that the life and activities of individuals play an influential role in the development of favorable attitudes towards failure. For example, previous start-up or venture experience and business closing experience of individuals have strong links to the development of a positive attitude towards failure. Moreover, the involvement of individuals in multiple ventures or start-ups also results in the development of a positive attitude towards failure (Politis & Gabrielsson, 2009). The development of this attitude is essential for entrepreneurship, for motivation, and for not giving up in the face of adversity.

Constructive Feedback

An accelerator program that promotes entrepreneurial learning must provide constructive feedback to participants. Constructive feedback is anchored on an effective communication and feedback system, where information flows effectively and efficiently from investors, mentors, industry professionals and speakers to cohort participants. Also, the program should promote regular events involving the alumni network so they can share their experiences with cohort participants. Moreover, events such as hackathons and talks bring together various ecosystem stakeholders like tech professionals, design experts, mentors, investors, and entrepreneurs to meet and expand their network (Bagnoli, 2020). Further, demo days provide a platform for ventures to pitch to a huge audience of potential investors to gain feedback, follow-on funding and visibility of business ideas (Goldstein et al., 2015).

This constructive feedback dimension is supported in this study by the findings of Crossan, Lane, and White (1995), who posited that learning is a dynamic process and when

110 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
P r o g r a m   f o r   t h e   H e a l t h c a r e   I n d u s t r y :   A   C a s e   S t u d y   o f
E I R A c c e l e r a t o r

organizational learning reaches the institutionalizing stage, individual and group interactions in feedback and feed-forward loops of continuous information flow are supported by structures and procedures anchored at the organizational level. Further, the findings of this thesis emphasize the need for a constructive feedback mechanism since participants stated the ability to access feedback from several parties in the accelerator as one of the primary benefits they gained from the program. The feedback helped them know how and where to get help, how to approach investors, structure start-up materials, prepare investor pitches, and identify market gaps. Furthermore, they indicated that they would have preferred more feedback in order to gain a deeper understanding of the group tasks. Finally, the participants identified elaborate feedback mechanisms as part of the aspects they had to change regarding communication and behavior in relation to their employees in their companies after participating in the accelerator program. Hence, constructive feedback will be at the core of an effective model of entrepreneurial learning in an accelerator program.

Team Learning

The "team learning" dimension is inspired by the second major theme from my study, which was "collaborating with one another". Under this theme, participants claimed that learning was more efficient when collaborating with other individuals. This theme is related to the first theme, in the sense that interaction between start-up founders and CEOs has been highlighted in both themes. However, it must be noted that in the second major theme, for collaborative learning to take place, participants must be open and willing to learn from and listen to others.

Direct support for collaborative learning between and among organizations is found in learning alliances. Learning alliances are business associations that aim for the parties involved to learn from one another (Khanna et al., 1998; Marchiori & Franco, 2020). They are crucial components in the construction of inter-organizational alliances, which give rise to private and common benefits among participating firms (Khanna et al., 1998). It is beneficial for start-up companies to form collaborative partnerships among themselves in order to build their individual capacities. Entrepreneurs can be reluctant to exploit existing networks to solve the challenges facing their products and technologies. Hamilton (2010) further states that for peer-learning to succeed, and for companies to be motivated to share their challenges and learn from one another, it is imperative to avoid competition issues between businesses in order to foster a safe environment for sharing. Based on these studies, collaborative learning

111 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
P r o g r a m   f o r   t h e   H e a l t h c a r e   I n d u s t r y :   A   C a s e   S t u d y   o f
E I R A c c e l e r a t o r

and the importance of a willingness to share insights with one another are supported in the literature reviewed for this study.

5.3.2 How Can a Virtual Accelerator Program Be Designed in Order to Facilitate Learning?
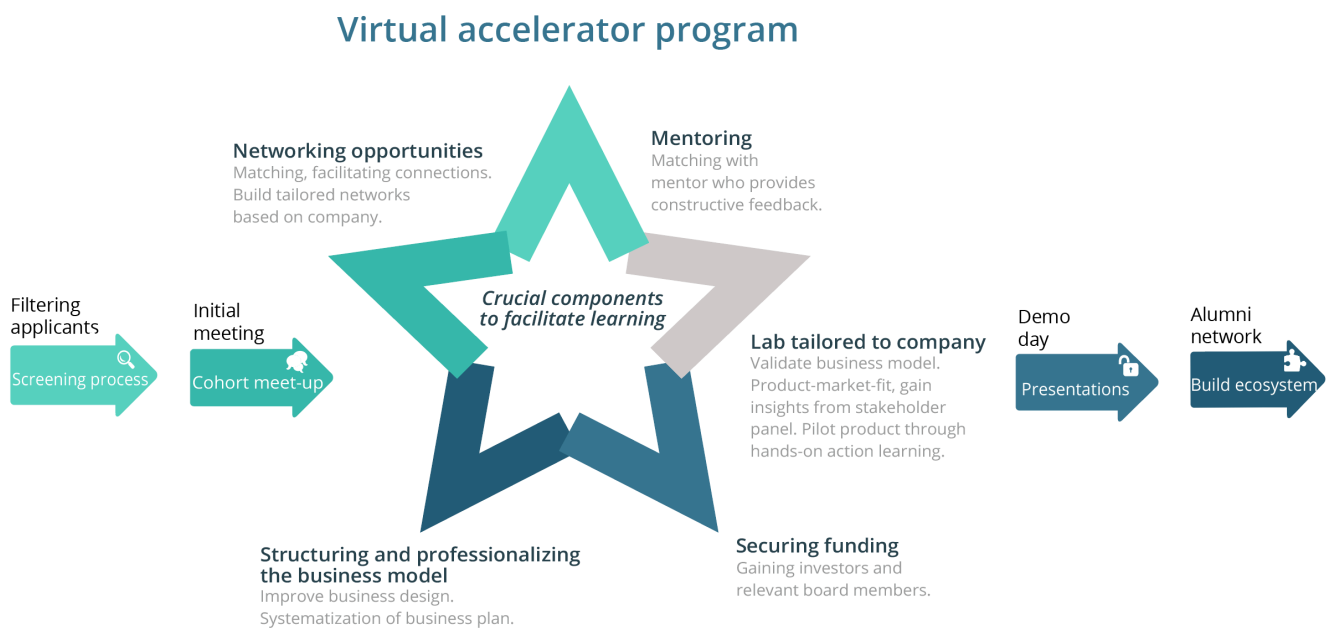
Figure 8: Design of a digital accelerator program that promotes entrepreneurial learning.

As a result of my study, I have identified five components that should be included in a digital accelerator program to facilitate entrepreneurial learning. The "networking opportunities" component is inspired by the major theme "building networks and connections in the healthcare industry". The "lab tailored to company" component is based on the minor theme "confirming the correctness of the process in the laboratory." Hallen et al. (2014) suggest that accelerators' contribution is primarily a reduction in the "liability of newness" on the part of participating ventures. They link this reduction to three main factors: the refining of the business model through formal education, the teaching of basic business skills (such as fundraising and pitching) and the access programs provide to resources, through networking. My program incorporates an initial in-person meeting for participants at the start of the program in order to facilitate "team learning", in addition to building an alumni network as a continuous

process after program completion in order to further expand network connections in the healthcare industry.

The extant literature on entrepreneurial studies and specifically venture creation highlights the relevance of intermediaries in support of start-ups by linking them to the resources that are embedded in the local ecosystem (Clayton et al., 2018). Start-ups need to leverage those resources, while at the same time avoiding the prospect of becoming overly dependent on any given intermediary, which could hinder their success in the future. Accelerators help address that challenge by providing access to extensive resources, including education, mentoring, networking, and funding, but only for a limited period.

The fixed-term nature of accelerator programs, which culminate in a graduation event, means that start-ups must take on market forces rather than being incubated by them. Through the accelerator program, start-ups can connect with local innovators and to critical elements such as deal makers, funding networks, and mentors crucial to the long-term success of the venture. That is while also educating them on the entrepreneurship process and how to best engage and leverage the resources in the ecosystem (Feldman & Zoller, 2012).

Filtering applicants

To ensure a program cohort is relevant and can learn from one another, it is imperative that companies are homogeneous enough. To be successful, the accelerator should target a specific industry, such as the health industry, and a specific phase of growth, such as early growth. Companies facing similar challenges should be recruited for the program. By doing so, the companies will be able to collaborate effectively and complement one another. In addition, the companies should be sufficiently different so that they are not in direct competition with one another. When filtering companies, it is essential to ensure that their objectives are aligned with the accelerator program's objectives, so that motivation remains high during the program (Peters et al., 2004).

Initial meeting

The cohort companies meet for the first time at the beginning of the program in order to get to know one another, which is an essential step in establishing long-term relationships. An initial physical meet-up at the start of the program improves group dynamics. Sharing is encouraged as participants gain confidence and trust in one another.

Demo day

Based on the results of the needs assessment, the accelerator program should culminate in a demo day. During this event, companies will present their product solution to an audience of investors and customers. Afterwards, they will have the opportunity to meet interested stakeholders at speed dates.

Alumni network

Upon completion of the program, the cohort firms are invited to join the alumni network. By doing so, they are contributing to the creation of an ecosystem within the health industry that will continue to grow. My study participants stated that the key to participating is to get more out of it than you put into it. There are many things that compete for an entrepreneur's attention in a busy everyday life. According to the entrepreneurs, they are already part of several alumni networks, but rarely participate because they do not feel that it provides them with enough benefits. The focus group shared that the alumni network must be a living network, constantly growing and sharing updated content, in order to be relevant to them over time.

Networking Opportunities

This dimension was inspired by the first major theme of building networks and connections in the healthcare industry, derived from my thematic analysis of the results. From participant data, it was found that there was a desire to build networks and relationships across the healthcare industry in order to reap the benefits of these relationships. According to Taylor and Thorpe (2004), entrepreneurs tend to be dependent on their network of relationships with other people. Similarly, through a strong network or connection with others in the health industry, cohort participants could learn how to address challenges and develop self-confidence in addressing them (Holmqvist, 2014; Mills et al., 2012; Powell et al., 1996).

The proposed model incorporates continuous interaction with industrial expertise. The accelerator is a facilitative platform that allows the exchange of ideas, knowledge, and expertise. For instance, networking opportunities can help start-ups identify customer needs and get in contact with relevant industrial expertise. As the literature links the first theme under the first category of the results section, it can be inferred that start-up companies have been seeking accelerator programs that would provide them with connections in order to gain said benefits (Taylor & Thorpe, 2004).

Accelerator programs which are facilitated with the industry tend to have a better feel of the pulse of the market. Industry experts and investors have an idea on what is the demand in the market and the direction in which the market is progressing. Through this kind of approach, the accelerator becomes the interface to connect with industry experts, corporates, investors and mentors. Such a facilitated program will allow them to get into a co-creation mode where the new product is being developed with a ready market to consume it. The start-ups could combine the expertise and industrial insights from the corporations utilizing them along with their agile environment to create a service or solution in a faster and more efficient manner.

With that in mind, accelerators provide ventures with the opportunity to learn from an extensive group of stakeholders, including cohort peers. This is because they are in the same boat during the rigorous learning period. This level of learning is based on the understanding that proximity accelerates learning.

Mentoring

In the literature review, I presented the model for mentorship by Mills et al. (2012). This model could be applied to peer learning networks between organizations. An effective mentorship program in entrepreneurship occurs when the mentor and learner work together to ensure that the learning cycle is complete and relevant to a particular situation and opportunity (Mills et al., 2012).

As part of an accelerator program, mentors are one of the most critical partners, as mentorship is among the most valuable assets entrepreneurs receive from the program. Mentors in this model will be experienced investors and entrepreneurs who have undergone a rigorous screening process. The main traits of successful mentors, according to the needs assessment I conducted, are unique expertise gained through experience, knowledge in a specific sector, and network. Since the accelerator program will require to be assessed and monitored, there will be a need for highly experienced mentors who can give feedback on how start-ups can maintain constant improvement geared toward growth and development (Cohen & Hochberg, 2014). Feedback will help the program reach its goals and objectives among entrepreneurs. However, the selection of mentors must be based on their willingness and a strong predisposition to assist new entrepreneurs in attaining success. This is because not all successful businesspeople make effective mentors. Moreover, the model will use its alumni network to attract qualified mentors for the program. According to Roberts et al.

115 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
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(2017), mentorship is one of the vital aspects of any accelerator program, for it offers guidance, mutual trust, and opportunities among stakeholders who are viable advisors and investors in the future (Goldstein et al., 2015).

According to Mills et al. (2012), mentorship is an effective means of making decisions and adjusting strategies and techniques to grow businesses. According to these researchers, mentors provide entrepreneurs with valuable social information because they help them recognize new opportunities and overcome their inexperience. In my study, the need for mentorship was emphasized by the participants. All five participants agreed that their involvement in the accelerator program and their self-esteem and confidence were boosted through mentorship. In addition, two participants said their ambition level also increased through the accelerator program via mentorship and guidance in relation to their business ideas. Finally, all participants asserted that there was a change in communication in their companies to employees following the lessons they had learned from various stakeholders in the accelerator. This included mentors and other advisors.

Mentors guide entrepreneurs to make the right decisions and test their business ideas (Clarysse et al., 2015). Similarly, according to Politis (2008), owing to the high level of uncertainty within entrepreneurship, failures are commonplace, which means entrepreneurial learning from failures tends to be a reality and a requirement. To that end, accelerators serve as a key enabler of entrepreneurial learning for fledgling entrepreneurs. This is because they afford them access to education programs, where mentors can detail their failings and help the new entrepreneurs avoid making similar mistakes.

Lab Tailored to Company

There is a growing market for welfare technology, but it is still in its infancy. Prior to the widespread adoption of health technology solutions, several technical, practical, and legal obstacles must be overcome. The NSCL, where companies could test and verify their product or service with patients, clinicians and medical staff, was a new and innovative component of the accelerator program EIRAccelerator. A user validation lab test, tailored to each individual participant, helps participants organize and execute a validation test for their start-up´s innovation. Through the lab they gained access to and collected feedback from potential end users. This is in line with research by Zhou & Wu (2021), who stated that hands-on experience is a pivotal element in enhancing an entrepreneur's capacity to identify opportunities in the marketplace, solve the relevant problems associated with addressing

those opportunities, gather the necessary resources to comprehensively address those opportunities, and establish a profitable venture.

It was demonstrated that the lab was an integral part of the program's success. The lab is a user-centered innovation method that considers real-life needs, where a real environment is used to test products and solutions. An accelerator program that incorporates a lab that involves users in developing cutting-edge services and products enhances the effectiveness of verification and expedites the commercialization of products and solutions. Setting up a systematic process for testing solutions in a reliable manner can be challenging to do on one´s own for a health-tech entrepreneur. Municipalities conduct many small pilot projects, but there are few actual implementations where newly developed products and services are fully utilized. There are many complex challenges that affect a variety of stakeholders, including health personnel, hospitals, cities, companies, and the government, and different stakeholders have different requirements. Therefore, having a lab test facility incorporated into an accelerator program is key to gaining insight into requirements and receiving feedback. This is to adapt the product to customers and their needs. Additionally, the lab ensures that products and services comply with laws, standards, and norms.

For a test and verification lab to be successful in an accelerator program, it must meet several objectives. The first step is to identify which phase the health accelerator is designed for. Early-stage entrepreneurs require a different type of lab than early-growth entrepreneurs. For early-stage entrepreneurs, the focus should be on testing ideas on end users and creating prototypes and minimum viable products. It is through this assessment that one can determine both the potential of the proposed solution and its role in the value chain. In the initial stages of product development, it is imperative that a product solution be thoroughly tested and evaluated before committing significant resources to its development. In addition, the test enables start-up companies in the initial stages to gain insight into the market's needs.

A different toolbox and strategy are required for early-growth companies, such as those in the EIRAccelerator. For an accelerator program focused on growth, the lab should be used for piloting, certification and implementation. During the final stages of product design, it is crucial to ensure that all details are optimized. A pilot project ensures that both the health service and the users will reap the benefits of the product. Testing provides insight into how to adjust and verify solutions based on the results. In a subsequent step, the lab should assist start-up companies in certifying their solutions in accordance with regulatory requirements, to

117 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
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conform to industry standards. A final benefit of the lab will be the ability to streamline the implementation process for start-ups.

Securing Funding

The accelerator program model seeks to raise capital from investors and partnerships like angel investors, family offices, corporations, and venture capitalists. It is vital to consider the amount of money that a company raises from various investors during an accelerator program. In addition to providing access to a large network of mentors and entrepreneurs, an accelerator's most significant feature is its network of investors. Obtaining the attention of the top investors in their respective industries would be difficult without the structured approach and contact network provided by an accelerator. Participation in the program is also beneficial for investors since they can reach a more diverse group of companies and can engage with them more efficiently (Cohen et al., 2019). As such, this is in accord with Politis et al. (2019) who states that a core feature of an accelerator program is that fledgling entrepreneurs are provided with specialized help in securing the requisite funding to launch their ventures. For participants to be successful in obtaining funding, they should receive feedback on their investor pitches throughout the program from investors, industry professionals, and mentors. Further, they should receive advice on how to structure the pitch for health technology investors, as well as how to avoid common pitfalls.

Based on a study conducted by Hausberg & Korreck (2020), a company that participates in an accelerator program is likely to be able to hire and attract more qualified employees and board members, demonstrate higher growth rates, and obtain funding more readily. The same applies to participants in the EIRAccelerator program. Participants stated that throughout the program they were put in direct contact with various investors. They received help in making a short-list of relevant investors to contact. After this experience, one participant indicated that they had gained an increased awareness of the investor universe and what investors to target. Instead of pursuing too many investors at once, the company is now focusing on a few investors with specialized expertise.

During the program, all companies engaged in dialogue with investors, and some even secured funding. In the words of one company: "*In order to obtain funding, it is a terribly complicated and tough process. You also need a bit of that kind of support. That we are a group that keeps doing the same thing.*" According to the results of the needs assessment I conducted, the results regarding funding are in line with what start-up companies had stated they were seeking. It is also

consistent with what the cohort companies hoped to achieve from the program, and what they reported as the most valuable gains after completion of the program.

One of the participants shared an anecdote about her company's capital needs. It started with the estimation of the amount required, the valuation of the company, what type of investor to be onboarded and how to go about developing a case. Using all the dimensions in a group learning mode, she claims that she is better equipped and mapped to handle these situations and is a better presenter. In one of the sessions, in which I participated in as a direct observer, this company shared that they had won a pitching competition and secured funding. In response to my question in the semi-structured interview with this participant after the program, as to whether the investor part of the program and pitching training had been helpful to her, she responded: *"It´s difficult to say if I would have landed them without the program. I think I would have, but maybe I would have spent more time."*

Structuring and Professionalizing the Business Model

A business model describes how a company conducts its business through a sequence of interrelated activities (Amit and Zott 2012). It describes how a company intends to make revenue and pricing decisions, as well as how and through which channels it intends to market and sell its product. In addition, it identifies what customer problems it will solve through its value propositions. It also identifies the type of customer segments that should be targeted, and how the company intends to establish and maintain relationships with customers. Furthermore, the business model outlines the key resources, activities, and partnerships required for the development and distribution of the product solution (Osterwalder & Pigneur, 2010). A digital accelerator program should address all these elements.

Mapping different parts of a business model helps visualize key aspects. It is easier to see strengths and weaknesses, and what needs to be improved. Market mapping is one aspect of working on the business model. Developing personas to understand decision processes is crucial for health-tech companies. Based on the statement of one company: *"We gained a lot from the market map. We have adopted customer development series and personas. We created five stakeholder personas: A nurse, a doctor, a clinic director, a buyer, and a patient. (...) We think it was very helpful. (...) We are much more aware of why we do what we do now than we were before. We did a really thorough mapping of what the board needs as well, and yesterday we were appointed a brand-new board, so we've used that map straight into board work and strategy work. So, it was very useful.. (...) It also applies to the fact that if you don't*

119 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
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get everything down into a structure, it is difficult to notice mistakes as well. When you write something, you don't see typos until you've written it. It really helps to visualize it."

As part of the program, start-ups will receive essential tools that they will be able to utilize to evaluate and improve their business models with their cohort peers. When working with the business model, these tools are useful for systematizing the process. The participants in the study appreciated assistance in structuring and streamlining their processes. In addition, their cohort peers, mentors, and industry professionals will provide them with a diverse range of perspectives. This will assist them in gaining new insights for optimizing their business model and provide a systematic approach. For a start-up to be successful, it must proceed from the idea stage, through testing, validation, development, and finally marketing and selling its product. The process of creating and optimizing the business model is best performed during the validation stage, during which the start-up team discovers the value proposition of their product solution and identifies the target customer. Further development of their business model is also an integral part of obtaining funding. By presenting the business model clearly, investors are made aware of the company's competitive advantage and gain a better understanding of how it operates. Thus, attracting investors and expanding internationally requires a solid business model.

5.4 How Does a Virtual Accelerator Program Impact Entrepreneurial Learning?

Over the past decade, technological advancement has made it possible to transition most processes into the virtual environment. Particularly over the past two years, and on account of the COVID-19 pandemic, the full transition to a virtual environment has gained increased relevance, with organizations and teams employing technology to accomplish their goals of interacting virtually. Indeed, scholars such as Gilson et al. (2015) believe that digital teams have the potential to transform the workplace significantly. The participants in my study who responded to the questions on the digital accelerator program experience, said that a digital format was beneficial because it made contact easy. However, they felt they could have benefitted more if the program had included some in-person sessions, especially at the beginning of the program. The view of the participants is supported by Secundo et al. (2017), who argued that professional social networking websites had been found helpful for individuals in improving their learning processes. Intellectual capital, which helps provide knowledge and skills, has been found to be one of the most significant mediators in

establishing the relationship between social engagement in virtual life and entrepreneurial learning processes. Therefore, for an accelerator to foster co-development, it must promote a safe, social setting and nurture ideas in a controlled environment. A safe, social setting enables entrepreneurs to share information and experiences. Further, it benefits them by bringing like-minded people close together and sharing resources, bringing novelty and goal congruence.

Cohorts within accelerators are communities in which entrepreneurs engage and learn from one another. If they are to be virtual, they would ideally comprise individuals in a distance-based environment featuring shared purpose and relationship, including a sense of belonging, trust, and interaction. However, some of the early studies on virtual communities highlight challenges in establishing and developing inter-personal relationships within computer-mediated interactions. They highlight the absence of critical environmental features, including physical appearance, non-verbal cues, and face-to-face interactions (Benbunan-Fich, 2003; Gibson, 2014: Cruz, 2021). Due to COVID-19, the EIRAccelerator pilot program implemented online sessions and remote work structures. Despite the participants reporting shortcomings in personal connection between cohort companies, all participants stated that their teams worked more effectively remotely during the pandemic, achieving new milestones. On the other hand, participants noted that the experience of interacting with people in person cannot be replicated online. In addition, the focus on testing through the NSCL did not allow the accelerator program to operate fully remotely.

The EIRAccelerator is, as previously described, provided by the Norwegian Smart Care Cluster (NSCC). NSCC is an Arena Pro cluster in the Norwegian national cluster program, located in Stavanger with departments in Bergen and Grimstad. Thus, the cluster has traditionally operated in the south-west region of Norway. In order to effectively collaborate, digital health companies usually had to meet physically before COVID-19. With the help of the virtual EIRAccelerator program, the network was expanded nationally, with participants from all over Norway being selected for the program. Innovations in the field of collaboration software provide opportunities for partnerships to be expanded nationally and internationally. Using a virtual design and digital technologies, it is possible to establish Scandinavian and even Northern European industry-specific innovation clusters. With specialized, virtual clusters, companies can be in different parts of a country or the world and effectively cooperate across regional and national borders.

On the other hand, many respondents limited digital technologies' potential by calling them "only tools". For entrepreneurs, accelerators are most valued for mentoring, building trust, and giving them a sense of belonging. In a virtual environment, the participants cited the challenge of developing trust between team members and creating a sense of community. This is in line with Kuhn et al. (2017), who argue that entrepreneurs prefer to receive advice and coaching through face-to-face meetings. Kuhn et al. (2017) stress the importance of trust-building and emotional support, which is consistent with what was found in my study: building trust seems to be one of the more challenging parts of online and virtual collaboration. Contrastingly, Cruz (2021) highlights the fact that virtual interactions present opportunities for individuals to develop unique approaches to group, and interpersonal interactions, where for instance, physical gestures are replaced by digital gestures. This creates an opportunity for companies from any geographical location to participate in the program. A virtual model allows accelerators to expand their networks and reach beyond their geographical location.

The final element of accelerator programs is training, and in the context of virtual accelerators, that means web-based training sessions and e-learning modules. Virtual learning using electronic media should factor in the contents of the training, and the ease of use of the learning platform, as that has a direct effect on user satisfaction (Cruz, 2021). Undoubtedly, there are concerns regarding the effectiveness of this approach in providing effective training. That said, studies conducted to determine the effectiveness of different training models detail the fact that learners report similar levels of learning reception irrespective of whether the training is done exclusively online, using a mixed model of in-person and online, or exclusively in-person model (Benbunan-Fich & Hiltz, 2003).

One of the program modules featured a particularly effective design, in which four presenters presented after one another. Virtual formats allow speakers to present according to their schedules without being required to meet in person. In addition, the format is conducive to fruitful discussions since everyone can see each other and can queue by raising their hands. During the online sessions, the program director managed the time and ensured that everyone had an opportunity to speak. Additionally, I have observed that in a virtual format, it is extremely convenient to share contacts and show one's own work directly while speaking. For example, you can share your screen so others can see your investor shortlist or share contact information in chat. The digital format facilitates the exchange of experiences and the building of networks.

122 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
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Although most of the accelerator program was digital due to its design and the COVID-19 situation, participants have suggested that some portions be converted to an offline model. Based on their past experiences, all of them have attended other accelerator programs in physical and they have reaped the benefits of it. Participants agree that networking and interpersonal relations can be better developed through partly offline programs. When meetings are held physically, it is easier to discuss the topic and ask questions. Start-ups are unanimous in their belief that the fully virtual experience lacks real-life connections. Therefore, the findings support the consensus that both online and offline work should be mixed into a hybrid model. Hybrid models of remote and in-person work have received positive feedback and are likely to remain popular. It is also worth pointing out that the findings reflect general changes in the workplace that were caused by COVID-19.

5.5 Limitations of the Study

The study has several limitations. Limitations refer to elements of a study that are beyond the control of the researcher. The first limitation of the study is the unavailability of more than one cohort because of the focus of the study on a pilot digital healthcare accelerator program. Because the program is newly launched, additional cohorts are not yet available. Nevertheless, this limitation is embedded in the problem statement of the study, which is focused on the new program.

In addition, the study has limitations associated with the types and timing of data collection. No data has been obtained from the companies during the program implementation, except for observational data. It could be beneficial to follow the companies both before, during and after the program to obtain a broader perspective on entrepreneurial learning. The companies were introduced before the program started, including their main goals and KTH mapping. In addition, insights were studied before the accelerator program started, interviewing ten start-ups in a needs assessment for the accelerator program. My participation in the accelerator program gave insight into the learning processes. An approach could have been to interview the participants during the program. The decision to avoid data collection during program implementation was based on the impression that interactions with participants during this period may interfere with the experiences and learning processes of the participants. Future research may be able to consider this limitation.

Another limitation is the focus on just one program. Because of this aspect of the study, the findings are also limited to the boundaries of the program of interest. Nevertheless, the chosen program is central to the problem and issue being explored in this study. To gain a deeper understanding of entrepreneurial learning, multiple cohorts or participants from different cohorts could have been approached. However, the study aimed to gain fresh insight into a novel phenomenon, a digital healthcare accelerator program in Norway. Therefore, the study focuses on a pilot cohort. Pilot programs usually exhibit some weaknesses since they have not been perfected, which can adversely affect learning outcomes. In this case, the findings of the study may be limited.

Despite the study meeting its primary objective, it used a small sample size – the pilot cohort of five start-up companies. The small sample cannot capture the views of all participants who have taken part in an accelerator program for the digital health industry. This may limit the validity of the conclusions drawn from the data collected from the sample participants. Further, the ecological and societal approach embedded in this model is subject to critique of the appropriateness of the various elements for establishing entrepreneurial learning models. Finally, given the rigid nature of the master thesis, it was impossible for every practitioner and scientific publication on the topic to be reviewed and included as part of the literature review.

5.6 Recommendations and Implications

It is recommended that in the future, researchers consider additional cohorts in the data collection. Having limited cohorts is inevitable because the program is still at its pilot phase. However, with the implementation of the program beyond the pilot phase, more cohorts may be available for exploration and consideration when conducting more studies about the digital growth program. Therefore, it is recommended that more cohorts be included in future research to gain a deeper understanding of the implications of the program for different organizations in the healthcare industry.

Another recommendation for future research is to obtain more types of data at multiple times during the program. Collecting information before, during, and after the implementation of the program may contribute to the richness and depth of data for a study. With richer and deeper data sets, a researcher could have more details about the program. He or she could use the data as a basis to gain deeper insights into the benefits, advantages, weaknesses, and opportunities for improvement of the program. Moreover, collecting data

throughout the different phases of program implementation could be helpful in the assessment of the improvement of participants during these different phases. This could be helpful in determining the specific needs of participants at different phases of the program.

It is also recommended that future researchers explore more programs for digital growth in the healthcare industry. In this manner, entrepreneurial learning in the healthcare industry may be explored deeper. Moreover, comparisons can be made between programs in order to identify the strengths, weaknesses, and opportunities for improvement of the different programs. Aspects that must be modified for the different programs may be easily identified because a basis for comparison is present.

In line with the third recommendation, it is also recommended that other industries be explored to identify and understand the implications and operations of programs for entrepreneurial learning. In this manner, the findings in this study may be compared. This is in order to determine if the themes applicable to the population and context of this study are also applicable to other industries.

This study creates a foundation for future research opportunities. Firstly, scholars should use the study to develop a widely accepted and elaborate definition of an accelerator program. Secondly, researchers should use this study to establish the social responsibility of accelerators based on the ties they establish in the ecosystem and the locations they operate in. Lastly, researchers should expand on the failure and success factors of accelerator programs to develop a framework that policymakers and practitioners can employ.

The implications of the study are based on the findings. From the findings about the importance of building relationships between organizations, it may be implied that developing productive and favorable relationships between start-up companies and stakeholders is beneficial. Specifically, the findings suggested that relationship building among entrepreneurs in the healthcare industry through the program of interest could lead to knowledge development. In this way, businesses perform better, and their customers and other stakeholders could benefit from the results of these relationships; thus, ultimately promoting positive social change.

Another implication for positive social change will be the possibility of improving the awareness of individuals about how co-learning relationships could lead to favorable effects for all parties involved, even when the parties are competitors to each other. The study suggests that harmonious and beneficial relationships between competitors can exist. Fostering learning from present and past experiences, start-up companies and industry players

could share experiences and learn from each other and mutually benefit from a relationship of collaborative learning.

The findings of the study have highlighted that relationship building and willingness for collaborative learning is critical to the success of entrepreneurs. These findings imply that organizations should consider cooperating in mutually beneficial relationships through learning alliances with other players within their industry.

5.6.1 Entrepreneurship Education

What are the potential implications of the generated results for entrepreneurship education? For policymakers, this question is crucial. A government must continuously assess what type of projects should be funded and make strategic decisions. Aside from choosing what accelerators and incubators to support, this also involves deciding what school programs and degrees to start within entrepreneurship and innovation. In this study, it was discovered that a virtual format makes learning more accessible. There was no need for participants to travel to a physical location to participate in the accelerator program. Business accelerators can increase applicants by using online tools. In light of the foregoing, it might be useful to further assess a national digitization strategy for the entire entrepreneurial ecosystem, including its associated clusters.

The idea that entrepreneurship skills can be learned is widely accepted (Klein & Bullock, 2006). Therefore, the question arises as to how learning should be facilitated. In the current study, it was evident that participants preferred a blend of virtual and physical designs. Virtual sessions provide flexibility. Physical settings were essential for the lab section of the program. As observed in this study, some aspects of learning can be achieved through traditional teaching methods, and other aspects require an experimental setting such as a laboratory. In entrepreneurship degree programs, the experimental setting could for instance have an element of role playing. Learning experiences in which participants could put their knowledge into practice were unanimously regarded as the most valuable. Therefore, entrepreneurship programs may spend less time on traditional classroom lectures, and more time on group discussions, active experimentation and mentoring.

Regional development and job creation are frequently cited motivations for promoting entrepreneurship and start-ups. Through virtual collaboration, the entrepreneurial ecosystem can be further developed. For rural regions without established local entrepreneurial ecosystems, it is possible to collaborate with other regions by eliminating geographical

restrictions and developing more cost-efficient entrepreneurship education programs. The results of this research can be used to investigate the possibility of funding virtual accelerators and incubators, as well as online entrepreneurship education programs. In addition, the programs should be encouraged to further digitalize their processes. This can be accomplished by making it a measurement criterion for public initiatives.

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129 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
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136 | E n t r e p r e n e u r i a l   L e a r n i n g   i n   a   V i r t u a l   A c c e l e r a t o r
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Appendices

Appendix 1: Interview Guides

Needs Assessment Interview Guide

1.0 Identify the key challenges faced by digital health start-ups

1.1 In your journey to date, what have been the greatest challenges?

1.2 What steps did you take to overcome these challenges?

1.3 Does your company face any obstacles to further growth?

2.0 Determine the most critical needs

2.1 Is there any guidance or assistance you have received along the way? In what ways has it been valuable?

2.2 Would there be any tools we could provide in an accelerator program in order to assist you in becoming better prepared for growth?

2.3 Is there anything you would want if you had the opportunity to design an accelerator specifically for your business?

3.0 Strategies for growth

3.1 Can you tell me how you work with strategy when it comes to growth and scaling?

3.2 In order to support growth, what tools could be included in an accelerator program?

3.3 Do you need any additional resources in order to gain a deeper understanding of the market?

4.0 Test lab as part of an accelerator program

4.1 Which methods are most effective for obtaining answers to critical questions and clarifications from customers?

4.2 What cost-benefit analysis has been conducted for your innovation? What can be done to quantify the value of innovation?

4.3 How can we enhance your ability to convey the benefits of your innovation?

5.0 Funding and mentoring

5.1 What is your approach to obtaining external capital?

5.2 What steps are taken to prepare for a presentation to investors, and how do you identify the right investors to present to?

7.0 Networking and mentoring

7.1 Would it be possible to build networks and incorporate concrete matching activities into the program? What are some ways we might be able to accomplish this?

7.2 Do you have any areas of need for additional knowledge? If you would like to acquire additional insight, with whom would you like to be connected?

7.3 If you were to choose a mentor from the top shelf, who would it be, or which person would it be? Can you describe the value you would receive from a mentor?

8.0 Virtual accelerator program combined with hands-on learning

8.1 As part of traditional accelerator programs, there is a significant amount of theoretical input. Would it be possible to have concrete value-creation activities, lab activities and pilot tests in the program? Would that be something we should explore?

8.2 How can practical and theoretical lessons be combined most effectively?

8.3 If you were to participate in an accelerator for the health industry, would you think it would work to conduct it through digital interaction and communication?

9.0 The results of the accelerator program

9.1 Can you describe the most valuable results you expect to achieve in the accelerator program?

1.0 Action-orientation and experience

1.1 How did you hear about the accelerator program and what motivated you to apply?

1.2 If you were asked to describe how you prefer to learn, what would you say?

1.3 What are some of the events or moments in the program where you learned something you consider valuable or relevant? Could you please elaborate on this? What effect did this event have on the development of your business?

1.4 In retrospect, what do you think of these learning events? Has any of them affected your behavior?

1.5 What was the impact of your background on how you experienced the program?

2.0 Learning from mistakes, crises and failure

2.1 Before you participated, what were the biggest challenges you encountered in your start-up? In order to overcome these challenges, what have you done in the program?

2.2 In what ways did the program challenge you? Did it affect you in any way? How do you feel about it now?

2.3 As an entrepreneur, how has this program affected your ability to cope with adversity? In response to challenges, do you have a different strategy now?

2.4 In your opinion, what was the threshold for making mistakes in the cohort group?

2.5 Did you share your own mistakes with your peers in order to facilitate learning?

3.0 Reflection on experience

3.1 In your opinion, what was the most helpful aspect of the program?

3.2 Where has your company made the most progress in the program? What steps have you taken?

3.3 After completing the program, did you notice any changes in yourself? What changes have taken place?

3.4 In your role as an entrepreneur and manager, have you acquired any new personal qualities or skills? If so, which ones?

3.5 What impact has the program had on your communication or behavior with your company's employees?

3.5 What advice would you give to future participants? If you had the opportunity to participate in this program again, what would you do differently?

4.0 Opportunities and problem-solving

4.1 How did you take advantage of the program and make the most of the opportunities offered? Before the program, did you have a strategy in mind?

4.2 Have you been able to solve problems or detect opportunities more effectively as a result of the program? Could you please explain how?

4.3 Is your approach to problems different now than it was before you participated? What are some examples?

4.4 As a participant in the program, how would you describe your experience with the NSCL?

5.0 Uncertainty, ambiguity and emotional exposure

5.1 From the beginning of the program to the end, how did you feel about the emotional journey?

5.2 Have your company's goals or your product changed during your participation? What is the nature of the changes?

5.3 Do you have examples of situations in which you were forced to step outside your comfort zone? Can you tell me what you learned from this experience?

5.4 Did you find any aspects of the program to be stressful? If so, how did it cause stress?

6.0 Social practice and social engagement

6.1 What was the value of being part of a cohort in the program? What did you learn from the other participants? Has being part of a cohort contributed to the development of your company? If so, in what manner?

6.2 What is your assessment of the group dynamics among the participants? Were you able to share? What did you learn from each other?

6.3 In what ways do you influence the work culture at your start-up? What has changed in your perception of the design of work culture?

6.4 What steps will you take to ensure that the skills you have learned in this program are transferred to your employees at the start-up?

6.5 Are there any changes in the qualities you look for when hiring new employees?

6.6 What was your experience participating in a digital accelerator program? How did it benefit you and what were the challenges?

7.0 Self-efficacy and intentionality

7.1 After completing the program, how would you describe your level of ambition? In the future, do you anticipate starting more businesses?

7.2 In what ways did the program affect your self-esteem?

7.3 Compared to before the program, how would you describe your motivation now?

7.4 Prior to and following the program, where would you place yourself on a scale ranging from risk-averse to risk-seeking?

7.5 Is your role in your start-up changing as a result of your participation in the program? Could you please describe how?

Focus Group Discussion Interview Guide

<ins>1.0 Take a close look at the learning outcomes</ins>

1.1 As a result of participating in the program, what have you achieved that you can attribute to the program?

1.1 In your opinion, what were the most relevant and valuable aspects of the program?

<ins>2.0 Teamwork in virtual environments</ins>

2.1 What was the experience of participating in a digital program? Are there any improvements you would like to suggest?

2.2 What was your experience of working virtually with other cohort members?

2.3 How was your experience working with cases in the program? Is there anything you would like to see improved?

<ins>3.0 Establish a network of alumni</ins>

3.1 What can we do to build an alumni network after the program? Is there anything that would attract people to participate in it? In what ways can an alumni network be valuable?

<ins>4.0 Improvement suggestions</ins>

4.1 What would you wish was different if you participated again?

4.2 What can be done to improve the program so that even greater results can be achieved?