Should Accelerators move to an online model?

Virtual accelerators and entrepreneurial learning

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ABSTRACT

Title of the dissertation: Should Accelerators move to an online model?

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Due to COVID-19, accelerators' program managers face the complex transition from face-to-face programs to a digital setting. Although some research has been done on understanding accelerators as an incubation mechanism, there is a gap about what differentiates virtual accelerators and how it affects entrepreneurial learning. This study aims to determine how founders' learning experience is transformed in a virtual model and the significant benefits and challenges of online-based accelerators.

A multiple case study with semi-structured interviews was done with program managers and founders based on a literature review on accelerators, entrepreneurial learning, and virtual teams.

Analysis of the responses demonstrated an existing trade-off with regard to virtual accelerators. On the one hand, the accelerator performance is enhanced, as it allows scalable, cost-efficiency and specialized programs. On the other, founder performance is affected, since cohorts find it challenging to establish a social connection and engage in networking and constructive feedback, mainly due to virtual communication constraints. However, founders reported higher learning satisfaction concerning training provided by the accelerator.

The results indicate that transitioning face-to-face programs to a virtual setting implies many careful considerations. How can program managers use the virtual world's benefits without losing the valuable features of face-to-face interaction? One possible way is to offer hybrid accelerators. Further research is needed to evaluate the virtual format, especially its defining characteristics and impact on the founders' learning experience and venture outcomes.

Keywords: entrepreneurship, accelerators, entrepreneurial learning, virtual environments, startup, cohorts, training

RESUMO

Título: Devem as aceleradoras transitar para o modelo online?

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Com o COVID-19, os diretores de aceleradoras enfrentam a complexa transição dos programas presenciais para o digital. Embora exista investigação sobre as aceleradoras como um mecanismo de incubação em si, há uma lacuna sobre o que diferencia os aceleradores virtuais e como isso influencia a experiência do empreendedor. Este estudo tem como objetivo determinar de que forma a experiência de aprendizagem dos empreendedores é transformada no modelo virtual e quais são os benefícios e desafios deste formato.

Um estudo de caso múltiplo, recorrendo a entrevistas com diretores e empreendedores de aceleradoras foi feito com base numa revisão da literatura sobre aceleradoras, aprendizagem empreendedora e equipas virtuais.

A análise das respostas demonstrou um *trade-off* existente em relação aos aceleradores virtuais. Por um lado, o desempenho do acelerador é aprimorado, pois permite escalar programas escalonáveis, e tornando-os económicos e especializados. Por outro lado, o desempenho do empreendedor é afetado, uma vez que as *cohorts* têm dificuldade em estabelecer uma conexão social e envolver-se em networking e feedback construtivo, principalmente devido a restrições de comunicação virtual. Apesar disto, os empreendedores relataram maior satisfação com as sessões de treino oferecidas pela aceleradora.

Os resultados indicam que a transição de programas presencial para um ambiente virtual implica várias considerações. Como podem os diretores usar os benefícios do mundo virtual sem perder as mais-valias da interação presencial? Uma maneira possível é oferecer programas híbridos. Mais investigação é necessária para avaliar as características deste formato e o impacto que tem na experiência de aprendizagem dos empreendedores.

Palavras-chave: empreendedorismo, aceleradoras, aprendizagem empreendedora, ambientes virtuais, start-ups, formação

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1. INTRODUCTION

Airbnb, a home-sharing business, was rejected by 15 angel investors (Business Insider, 2015) before raising 5.8 $billion in capital (total funding). Reddit, a network of communities, struggled to find the first customers, however, in 2019, reported an impressive 430 million monthly active users. Twitch's founders, a Live Video Streaming platform, built two startups before succeeding with Twitch. Today Twitch employs over 5,000 employees.

In common Airbnb, Reddit or Twitch shared the same acceleration program. These three startups joined Y-Combinator, the first accelerator in the world. Accelerators are organizations that aim to accelerate successful venture creation (Pauwels et al., 2016) and, most importantly, intend to accelerate learning.

Typically, founders relocate to the accelerators headquarters wherein entrepreneurs work "shoulder to shoulder", occupying contiguous workstations (Dushnitsky & Sarkar, 2018). *In sito*, entrepreneurs receive training from accelerators' managers on general and technical subjects; connect with a network of mentors, learning about their industries; improve the business idea and pitch while providing other founders constructive feedback and insights. All these activities are learning. Currently, learning is enhanced by stakeholders being physically located in the same business premises.

Recently, COVID-19 pandemic has forced most accelerator programs to offer online-based programs, which might have changed many aspects of how they are delivered. This research's main concern is finding out whether the same learning mechanisms are still occurring in a virtual cohort and, ultimately, discovering accelerators' benefits and challenges with transitioning to a virtual environment.

Before the global health crisis, entrepreneurship was a growing trend in many countries, as data suggests (Bosma, 2020). The literature on entrepreneurship demonstrates why this is a domain distinct from strategic management (Venkataraman, 1997). Several scholars see this field as an opportunity based (Ardichvili et al., 2003; McMullen et al., 2007; Shane & Venkataraman, 2000; Short et al., 2010), where the understanding is on how future services and products come about and who is behind that discovery and exploitation. One aspect that remains essential during this journey is the need to engage in entrepreneurial learning to overcome hurdles.

Entrepreneurial learning (EL) has its roots in learning theories (Rae, 2005). In this study, we will look to how vicarious learning – "*learning through the experiences of another"* (Fox, 2003)- has been transformed within virtual accelerators. The research is based on program managers and founders' perspectives. The literature on vicarious learning demonstrates the

importance of learning from observing others to build a successful venture. Vicarious learning reduces entrepreneurs' psychological stress, and helps to better cope with external uncertainty (Xie et al., 2020); avoids needless and often costly errors (Bandura, 1977); develops knowledge and contributes for achieving better performance (Myers, 2015). Therefore, it is essential to assess whether vicarious learning has been transformed with accelerators' digitalization and what organizational changes might be associated with it at the accelerator-level.

Business incubation becomes more relevant with the entrepreneurial spurt (Bosma, 2020; Dee et al., 2012). Accelerators are a supportive and learning ecosystem. In them, a startup is helped over a period while typically having access to office space, consulting, feedback and investment (Stayton & Mangematin, 2019). Hence, accelerators are an ecosystem of interactions, where learning happens at multiple levels (Miles, 2017).

Cohen (2013) suggests that various programs' aspects might influence learning acceleration, namely, the experience provided by program managers that help ventures project future outcomes (Cohen & Hochberg, 2014). Also, ventures accelerate learning by relating to cohort peers (Dushnitsky & Sarkar, 2018), making them push forward their performances and be inspired by cohort peers' extreme efforts. Accelerators reduce the expenditures required to set up learning (e.g., scheduling interactions, travelling), and by doing that they provide entrepreneurs with faster entrepreneurial learning.

In short, studying accelerators can provide insights into entrepreneurial learning. Since this thesis aims to understand how learning is being transformed inside a virtual accelerator at two relationship-levels (program manager-founder and founder-founder), we will focus on individual learning to better assess those changes.

Literature is very scarce on virtual accelerators (Hallen et al., 2014). Thus, this study aims to discuss how the accelerators' virtual environment modifies learning among cohorts and the significant benefits and challenges for founders and the accelerator.

Besides accelerators, virtual environments where peers collaborate and interact are also growing phenomena (Marlow et al., 2017). With COVID-19 (Akkermans et al., 2020), a big part of the global population had to change from physical to a virtual presence quickly, and accelerators were no exception.

Conversely to virtual accelerators, the literature on virtual teams (VTs) presents a more extensive academic body. Broadly, it reveals how technologically mediated interactions impact

various elements of VTs (Driskell et al., 2003). Overall, the essential virtual environment features are team members' ability to connect, communicate, and coordinate themselves. Social connection is fundamental for team cohesion and trust (Powell et al., 2004). Hence, communication is a critical component of human interaction (Suchan & Hayzak, 2001). If not guaranteed, virtual interactions become ineffective, undermining learning interactions. Finally, coordination is the main feature that, if not correctly implemented, team members cannot connect or communicate (Kayworth & Leidner, 2000). Therefore, coordination is of paramount importance to create the conditions for learning.

However, literature is scarce in terms of how these features, or, more broadly, virtual environments specifically affect the founders' learning experience. Understanding how virtual environments influence the cohort's ability to socialize and learn, the program manager's ability to coordinate, and the acceleration model's overall changes, such as training, are crucial to ensure the highest impact acceleration programs possible (Levinsohn, 2015).

In conclusion, entrepreneurship and the business incubation industry are a growing trend, where accelerators act as catalysts for the founder's success. Converting physical' programs to online-based ones might affect entrepreneurial learning since virtual environments pose various challenges. There are research gaps that, if addressed, could mean an advancement for entrepreneurial learning and acceleration programs.

The first gap is related to **how are online-based accelerators affecting founders' learning performance.** This study seeks to explore how interactions and learning processes within the virtual environment are changing. It is vital to fill this gap to prevent ineffective acceleration programs and ensure founders choose the suitable program when entering a virtual accelerator.

The second gap is **on revealing the benefits and challenges associated with virtual programs.** By comprehending the critical elements that are undergoing changes, it will be possible to successfully develop valuable and practical insights into operating an online acceleration program.

In sum, the aim of this thesis is on the following research questions:

Q1: How are founder learning interactions being transformed with the transition to remote programs?

Q2: What are the significant benefits and challenges of a virtual accelerator?

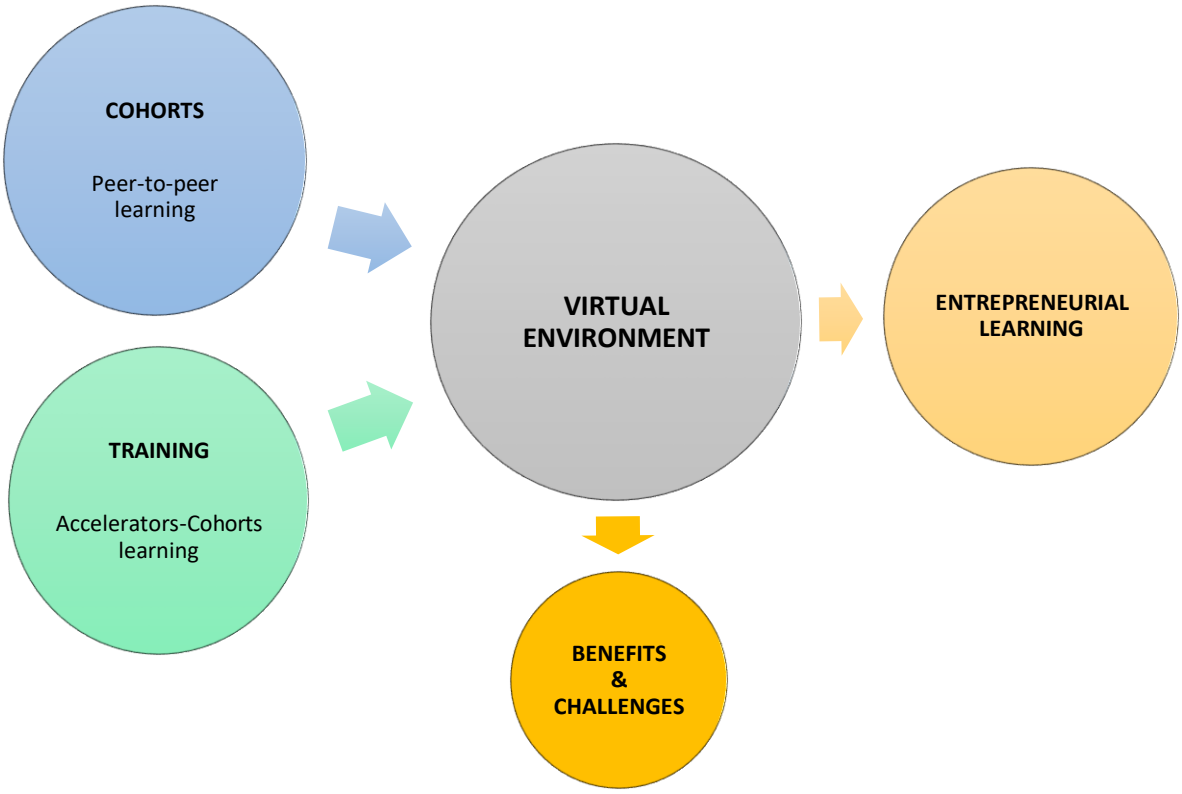

Figure 1 - Overview of research topics

An inductive multiple case study was performed among startup founders and accelerator' program managers to address these research questions. Accelerators are a relatively recent organizational form; therefore, an inductive method revealed to be an appropriate method since there is not enough theory to explain the studied phenomenon (Yin, 2009).

After an exploratory study, to reconfirm these research questions' practical relevance, primary data was derived from semi-structured, in-depth interviews. This method is one of the most important qualitative data collection methods and has been widely used in field studies (Qu & Dumay, 2011). The data was then organized around emerging concepts based on literature and was further enlarged by various secondary data sources. The study enlarges the theoretical understanding of virtual accelerator programs and addresses a possible growing format, hybrid accelerators.

In this study, the research setting is accelerators, in which founders (n = 5) and program managers (n = 9) were interviewed.

This research has some significant contributions. On a theoretical level, we hope to address the literature gap of how virtual accelerators affect founders' learning experience and the benefits and challenges of this format. Prior research has focused only on classic accelerators. Therefore, we build a conceptual framework of how the virtual setup influences accelerator and founder performance. On a practitioner level, this dissertation has others contributions to program managers and founders.

First, we aim to answer how working in a virtual cohort affects founders learning experience. Program managers should understand the outcome of working in a virtual cohort, the impact on startups' learning process, and what participants lose and gain with it. By doing so, program managers can redesign the program to ensure the best possible outcome for participants.

Second, for founders, understanding the implications of a virtual format will help startups decide what virtual acceleration program they should choose. Entrepreneurs are looking for support, mentorship, and capital opportunities that an accelerator can provide. However, acceleration programs have differences among each other (Clarysse et al., 2016). Choosing an accelerator to apply is a high involvement decision. Founders will be better equipped to decide if they know the benefits and challenges of the virtual format.

The thesis is structured as follows: in order to build a theoretical base for the study, chapter 2 reviews the relevant literature on entrepreneurship, accelerators, entrepreneurial learning, as well as how accelerators stimulate learning. Then, a review is done on how virtual environments influence learning and its impact on accelerators. Chapter 3 introduces the methodology, which was applied for data collection and analysis. Chapter 4 presents the empirical findings, whose meanings are discussed according to the literature in Chapter 5. Lastly, after addressing theoretical and managerial implications, Chapter 6 describes the study's limitations and suggests future research directions.

2. LITERATURE REVIEW

2.1 Entrepreneurship

Entrepreneurship is defined as the field that:

> "*seeks to understand how opportunities to bring into existence "future" goods and services are discovered, created, and exploited, by whom, and with what consequences*."
> (Shane, 2000; Shane & Venkataraman, 2000; Venkataraman, 1997).

This claim hints at a process with two elements: the entrepreneur and the opportunity. In this process, the entrepreneur discovers the opportunity and tries to explore it in the form of a venture, after bringing it into existence.

The *entrepreneurial idea* is a function of creativity and learning (Short et al., 2010). However, before recognizing the opportunity, the entrepreneur goes through cognitive and learning processes. For example, the form and direction of mental simulations and counterfactual thinking influence "*whether a person can break the existing means-ends framework, develop alternatives, and identify innovative market opportunities*" (Gaglio, 2004). In short, entrepreneurship is related to opportunity identification. This opportunity recognition implies specific knowledge. Finally, acquiring this know-how involves learning.

The identification of new "means-ends relationships" implies individuals to have prior knowledge. However, learning is not enough to increase the likelihood of discovering those opportunities. Besides prior knowledge, entrepreneurs also need to have cognitive properties to transform that knowledge into an excellent entrepreneurial opportunity (Ardichvili et al., 2003; Shane & Venkataraman, 2000).

How these cognitive properties (interconnected with knowledge) are used is a crucial component of entrepreneurship. Mostly because of the development of the 'how' and 'when' regarding learning (Wang & Chugh, 2014). Consequently, before using those cognitive properties and competences, the entrepreneur must engage in learning, so that s/he can tackle the challenges associated with the entrepreneurial process – "entrepreneurial awareness, resource acquisition, and management" (Leitch & Harrison, 2005). Simultaneously, learning as a mean to acquire resources (knowledge and skills), is vital for organization creation (Gartner, 1989) as well as to achieve a competitive success (Sullivan, 2000). Business incubation mechanisms allow entrepreneurs to do exactly that. Mainly, seed accelerators, which are described as a way of speeding up venture creation and product launch (Bliemel et al., 2016), provide entrepreneurs with the right learning tools during the entrepreneurial process and help mould the opportunity into desirable goods or services.

2.2 Accelerators

Acceleration is defined as the rate of change in the speed of something (Cambridge Dictionary, 2020). Being accelerated implies increasing the velocity at which an object or a person goes. Seed Accelerators or Startup Accelerators (hereafter referred to as “accelerators”) are directly

connected with acceleration. Their ultimate goal is to create a venture with higher and faster chances of market success. Accelerators can be defined as (Crișan et al., 2019):

> *Organizations that provide support for startups to accelerate their development through one or more processes: learning, validation, access & growth, and innovation.*

Since 2007, there has been a significant evolution of the accelerators landscape (Stayton & Mangematin, 2019), seeing that programs have started globally. Estimations in 2016 point to over 3000 accelerators worldwide (Hochberg, 2016), providing funding to over 8000 startups (Seed-DB 2020). The accelerator movement started in California, USA, where Y-Combinator provided various services and intense support. Since then, it has helped develop many technology companies, including Dropbox, Airbnb, Coinbase and Reddit, and the combined worth of Y-Combinator' graduates' was estimated at a value of over $80 billion in June 2017 (Miller & Bound, 2011).

There are five general features of accelerators (Miller & Bound, 2011), supported by four processes (*learning, validation, access & growth, and innovation*) (Crișan et al., 2019): selective application process; pre-seed investment; focus on small teams; time-limited support including mentorship; and cohort batches.

Firstly, the application process starts through web-based application processes. Applicants fill a form that asks about the founding team and the startup idea. Programs are highly selective (using experts as judges) and limit the number of startups each accelerator can support (Assenova, 2019).

Secondly, investment is crucial for nascent ventures (Ebbers & Wijnberg, 2012). Some accelerators provide pre-seed investment during the first three months, based on an assumption about how much it costs per founder to live during and for a short period after the program. Additionally, the programs end with a public pitch event (Hochberg, 2016), also known as demo-day, where founders pitch their business ideas to potential investors.

Thirdly, rather than focusing on individuals with startup ideas, accelerators want to accelerate teams since it is challenging to succeed when alone in an entrepreneurial venture. The teams are small (Barrehag et al., 2012), usually around 3 or 4 entrepreneurs.

Fourthly, accelerators are a limited-duration program (Weiblen & Chesbrough, 2015), usually a three-month duration that can be explained by two different reasons. First, by having a short amount of time to accelerate the early-stage venture, entrepreneurs are forced to "get a lot done" (Cohen, 2013). Second, since the program has strict graduation dates and ends with a specific event (demo-day), the possibility of codependence between ventures and accelerators is reduced (Cohen & Hochberg, 2014).

Additionally, cohorts from 10 to 12 ventures are invested in simultaneously (Clarysee, 2016), which has benefits due to the peer support that the teams provide each other (Pandey et al., 2017). This model replicates what happens in university where students study and graduate together.

In sum, accelerators are resource-aggregators. Clarifying the outcomes and mechanisms of accelerators allows us to comprehend why this movement has reached new worldwide dimension.

The literature points out three significant outcomes regarding accelerators: a network builder (Wright, 2018); an innovation enabler; and a foster of entrepreneurship culture (Miles, 2017). Achieving these outcomes includes four mechanisms at the accelerator-level: validation, access & growth, innovation, and learning. The first, validation is related to accepting/validating entrepreneurs' ideas (e.g., through meetings). Secondly, access & growth is concerned with combining *typical* interventions and average hard outcomes (e.g. access to investors, avenues to reach new markets, and support for product development and launch). The third reflects the complex innovation process that occurs in accelerators. Lastly, we have the process of learning. This process is one of the most important since it is how entrepreneurs acquire new relevant information, knowledge, and skills (Politis, 2008). This acquisition includes learning outcomes such as business and technical knowledge, vicarious learning, and social capital.

2.3 What is entrepreneurial learning

As an overall process, learning is considered a multi-dimensional phenomenon being present in every venture pursuit (Nogueira, 2019). This multi-dimensionality involves multiple aspects such as emotional (Jason Cope, 2005) and cognitive aspects (Corbett, 2005). In the entrepreneurial context, learning improves and accelerates an entrepreneur's journey (Unger, 2006) when going through discovery, evaluation, and exploitation of an opportunity. Hence, EL scholars have considered EL to be the interface between learning and the entrepreneurial context (Leitch & Harrison, 2005; Minniti & Bygrave, 2001; Nogueira, 2019). This interface

can be defined as the continuous and dynamic learning cycle (Politis, 2005; Sullivan, 2000) that informs the entrepreneur's quest for new opportunities (Franco & Haase, 2009). Wang & Chugh (2014) systemized literature on EL and stated that it could be divided into an organizational and individual level.

In individual learning, experience has been noted as one of the most prominent types (Kolb, 1984). There are several mechanisms which are part of the experiential learning process such as trial-and-error (Lant, 1990), learning-by-doing (Cope & Watts, 2000), learning from experience (Minniti & Bygrave, 2001), and vicarious learning (Huber, 1991). Adding to the understanding of EL, experiential learning theory demonstrates that entrepreneurs' learning involves the transformation of experiences into knowledge (Kolb et al., 2014; Politis, 2005). The acquisition and transformation of knowledge are considered an individual-level phenomenon and implies an experiential learning process perspective (Nogueira, 2019). This perspective involves three different themes, namely distinct learning styles (Kolb, 1984), learning from failure (Lattacher & Wdowiak, 2020), and vicarious learning (Mansoori, 2017).

In the accelerator context learning through the experiences of another, i.e. vicarious learning (Fox, 2003) is particularly relevant. We aim to understand how the transition from onsite to online accelerators has transformed two core learning vehicles for founders: training and cohorts (both vehicles include learning from others).

Vicarious learning foundations can be rooted in individual social learning theory and organizational imitation studies (DiMaggio & Powell, 1983). Vicarious learning occurs when entrepreneurs observe other people outcomes and, through close contact, imitate the behaviours with positive results (Bandura, 1977). This close contact is the socialization process (Jones & Tullous, 2002), and it influences entrepreneurs' business expertise. This experiential learning mechanism has been found in accelerators. In them, entrepreneurs are in constant contact with stakeholders - learning through second-hand experiences - which can reduce the cognitive load of direct experiential learning activities (Nogueira, 2019). By losing the socialization process imposed by virtualization of programs, one could ask if learning with others' experience, namely founders learning from program managers and peers, still holds in online acceleration programs.

To better grasp with EL, one should investigate how learning is related to entrepreneurial success.

2.4 How learning affects the entrepreneurial journey

The entrepreneurial learning process is one of the entrepreneurship components (Mets, Tõnis; Trabskaja, Julia; Raudsaar, 2019). Before engaging in this process, the entrepreneur learns in the form of experience (Erikson, 2003). Then, opportunity identification follows (Cha & Bae, 2010). Individuals who take the learning initiative and accumulate their learning competencies have more opportunities to succeed in their entrepreneurial endeavours (Tseng, 2013). The maturing of the entrepreneur capabilities is also related to the interaction with other stakeholders; for instance, mentors (Sullivan, 2000) or customers. Thus, implying that interaction and experience might improve entrepreneurial ability and performance (David, 1998).

Deakins (1998) hypothesized critical factors affecting the ability of the entrepreneur to learn: the ability to network, especially at early stages; ability to assimilate experience and opportunity; the ability to reflect on past strategy (and mistakes); the ability to access resources; and the ability of the entrepreneurial team. These factors are much related to venture accelerators for two reasons: first, accelerators main goal is to fast-track early-stage ventures learning (Dempwolf et al., 2014); second, acceleration programs are resource-aggregators and, thus, learning-based infrastructures from which founders can learn (A. Isabelle, 2013).

Politis et al. (2019) studied EL in venture acceleration programs and concluded that three triggers – affective motivation; peer atmosphere; and constructive feedback – influence participants' learning outcomes. Entrepreneurs would then generate knowledge through the transformation and grasping of the accelerator experience (Kolb, 1984).

Indeed, the entrepreneurial journey is a process with significant and critical events; hence, the entrepreneur will be more competent in dealing with setback if s/he learns from others' decisions, mistakes, experience, and networks (David, 1998). Skilful entrepreneurs will amplify the knowledge generated from experiencing learning events, determining how successful their firm eventually becomes.

2.5 Accelerators: stimulating entrepreneurial learning

Following the previous discussion about accelerators, Cohen (2013) thoroughly investigated the process of learning from others. These organizations allow ventures to learn vicariously from a large group of stakeholders (managers and cohort peers) since they are in the same location during an intensive learning period. In sum, proximity seems to accelerate learning.

Indeed, the entrepreneur learns through distinct routes, and this learning enhances his cognitive properties. However, one crucial aspect is the cost that the entrepreneur incurs to take on the learning process - identified by Cohen (2013) as the learning-coordination costs. This concept can be described as the money and time required to set up learning. Directing, tracking, and redirecting the resources to achieve a particular learning goal are demanding activities (Woods, 2017). Examples of these learning-coordination costs might be administrative tasks such as scheduling interactions and travelling and networking before learning interactions.

By reducing these costs, entrepreneurs and ventures can learn more quickly and more thoroughly since all the effort can be solely invested in learning (Stigler, 1961). Furthermore, Cohen (2013) demonstrates how accelerators reduce learning-coordination costs in multiple ways (e.g. mentor interactions; managers feedback). Besides, she states that accelerators "expand entrepreneurs' social interactions, enhancing opportunities to learn vicariously".

Cohen and Hochberg (2014) highlight unique features in accelerators that enable entrepreneurial learning to take place. The authors point to the importance of cohorts and training. Other features such as mentorship and location could be considered; however, this thesis will not address them.

2.5.1 Cohorts

Cohorts are batches of startups that join the accelerator program simultaneously (Miller & Bound, 2011). There are two primary cohort's environment characteristics: competition and cooperation. The former, due to the entrepreneur's perceived limitation in terms of time and resources and peer pressure when working side-by-side. The latter, because of the community built among cohort peers, leading them to support each other and share experiences. This program format allows entrepreneurs to learn vicariously (Cohen, 2013). For example, peers can help each other by engaging in problem-solving and informal feedback sessions (Barrehag et al., 2012; Miller & Bound, 2011).

Other scholars point out that performing similar tasks fosters partnerships between individuals (Kandel & Lazear, 1992). Peer effects might also influence entrepreneurs' decisions (Kacperczyk, 2013; Stuart & Ding, 2006) by empowering a more realistic evaluation of each entrepreneurial venture's chance of success (Smith & Hannigan, 2015). Cohorts bring to the surface the peer pressure effect. Peer pressure can be defined as

> *"the notion that humans are influenced in their beliefs, preferences, and behaviours by the beliefs, preferences, and behaviours of others"* (Mason et al., 2009).

Falk & Ichino (2006) argue that this effect enhances team performance. Since cohorts work on a collaborative format, cohort peers accelerate learning by actively helping one another, either directly or indirectly. For instance, when there are public updates about the cohort progress, a rivalry is instilled, and knowledge spillovers between teams occur. Also, cohorts accelerate learning by dividing it. In other words, team members specialize in an area of expertise, which optimizes learning because team members focus on learning related to their area of expertise (Gibson & Vermeulen, 2003). This process fosters trust and communication among peers (Cohen, 2013). Trust because team-members learn in parallel and have to rely on each other's capabilities; Communication since dividing the learning experience fosters an internal communication cadence that enhances (Bingham & Haleblian, 2012) and crystallizes (Stasser & Titus, 1987) learning.

Finally, in terms of EL, being onsite and working side-by-side in cohorts fosters this learning type. Therefore, location services are a fundamental part of the accelerator program package. Even if they are limited to co-location in a shared open office space, they encourage collaboration and peer-to-peer learning (Pauwels et al., 2016).

2.5.2 Training

Training is also one of the main elements of accelerators, where entrepreneurs have the chance to learn and expand their cognitive resources. Accelerators focus on developing human capital (Barrehag et al., 2012), by providing individuals with a curriculum or a training program throughout the acceleration (Pauwels et al., 2016). The training comprises an array of business concepts (e.g. Unit economics; Search Engine Optimization; Term sheets; Customer Development), methods (e.g. Lean Startup) and other topics (e.g. classes with legal and financial professionals; how to develop a funding pitch). Additionally, they provide access to seminars and *ad hoc* events, such as expert workshops and inspiring lectures (Pauwels et al., 2016) given either by directors of the program or invited speakers. These training inputs are meant to improve the entrepreneur skillset, whether related to general management or technical aspects of running a high-growth business.

In sum, accelerators offer formal and informal training to accelerate entrepreneurs' learning curves (Stayton & Mangematin, 2019). Hence, the opportunity-recognition and following exploration of the entrepreneurial idea is optimized.

2.6 COVID-19: Shift to virtual environments

Even though COVID-19 forced a full transition to a virtual environment (VE), the literature on virtual communication and environments reveals a growing trend of organizations and teams using technology to achieve their goals. Scholars believe that virtual teams (VTs) can transform the workplace (Gilson et al., 2015). Martins et al. (2004) defined VTs as teams

> "*whose members use technology to varying degrees in working across locational, temporal, and relational boundaries to accomplish an interdependent task*".

They represent a new form of organization where flexibility and responsiveness are significant benefits (Powell et al., 2004). However, organizations must ensure that their technology infrastructure is aligned in order to support VTs. In other words, an organization mission, strategy, rewards, and controls need to support virtual team design (Suchan & Hayzak, 2001). Additionally, technology should be carefully integrated since VTs cannot fully substitute face-to-face communication - "*there appears to be something critically different about sharing the physical space*" (Sellen, 1995).

2.6.1 Social connection

The literature on virtual environments has been analyzed on multiple interdependent levels, including relational development and teams' communication and coordination in computer-supported groups. Relational development is concerned with how intragroup relational links evolve over some time; in other words, the process of developing relational intimacy (Chidambaram, 1996). Research on VTs points out two theoretical views about computer support's impact on teams (Chidambaram,1996). The first states that computer-supported teams need a longer time to develop close relations than the face-to-face team. In contrast, the second view claims that, over time, computer media users will adapt the medium to meet their relational needs. Research arguing for a longer time for VTs to develop closer relationships also shows that even with similar communication levels, face-to-face team members report higher satisfaction levels than virtual teams (Warkentin et al., 1997). When assessing fundamental

processes that foster team effectiveness (e.g. socio-emotional process; relationship building; cohesion; communication; coordination), researchers show that virtual teams do not outperform face-to-face teams (Andres, 2002; McDonough et al., 2001). Moreover, VTs face a significant challenge in achieving the same effectiveness level (Powell et al., 2004). For instance, Robey et al. (1999) showed the value of face-to-face meetings in establishing a significant social connection between members.

In this thesis's context, transitioning this socio-emotional process of accelerators' stakeholders, such as program managers and founders, to a virtual environment might impact the social connection and relationship building.

Regarding team cohesion, some studies have found that VTs begin with lower cohesion, and over time, exchange enough social information to develop strong cohesion (Chidambaram, 1996; Powell et al., 2004). Other studies indicate that technological mediation can negatively affect cohesiveness (Straus & McGrath, 1994). More specifically, by damaging interpersonal bonds (interpersonal attraction), normative bonds (group pride), and instrumental bonds (task commitment) among team members (Driskell et al., 2003).

2.6.2 Communication

Another critical aspect of VTs that has understandably received significant attention is communication. Communicating effectively, i.e. establishing mutual knowledge among members, is made more difficult in a computer-mediated environment since the exchange of information is slower, less complete and requires more effort from team members (Driskell et al., 2003). However, concerning the extent of communication, VTs have been found to communicate more frequently than traditional teams (Powell et al., 2004). Nonetheless, quantity does not imply quality and "*effective participation in such electronically supported groups requires significant investments of time and energy on the part of its members*" (Eveland & Bikson, 1988) to ensure all parties understand the shared information.

2.6.3 Coordination

Another aspect that has been researched in virtual environments is coordination. It has been linked to the struggles VTs face when trying to coordinate across time zones, cultural divides and divergent mental models (Maznevski et al., 2000). As international organizations, accelerators might face the said challenges in managing all interactions.

In conclusion, the above mentioned literature and information leads us to assume that, overall, distance is a relevant factor in a virtual setting. In other words, human interaction happening on a virtual environment can have a significant, mostly negative, impact, on teams' social connection, communication, and coordination.

2.7 Virtual Learning

As seen before, interaction can take many forms in a virtual environment (VE), including synchronous or asynchronous communication, one-to-one or one-to-many, text-based or audio and video. Virtual learning environments (VLEs) are

> "*computer-based environments that are relatively open systems, allowing interactions and encounters with other participants.*"

They also provide access to a wide range of resources (Wilson, 1996). Therefore, Dillenbourg et al. (2007) consider a VLE a social space. Learning activity in VLE is close to a project's notion, where participants are members and contributors to the social and information space.
It is possible to integrate a VLE with rich pedagogical scenarios to achieve more effectiveness. However, there is always the challenge to achieve mutual knowledge when in asynchronous communication, since

> "*restricted feedback may make it more difficult to transfer information and to identify and correct errors in the transfer of information as they occur*" (Driskell et al., 2003).

Also, VEs make more challenging to form closer interpersonal relationships between members (Powell et al., 2004). Consequently, the team performance might be affected since the team's socio-emotional development is not assured. If the team does not have a social connection, learning from each other might be in jeopardy.
However, a positive side of VEs and their potential to enhance learning (Martins et al., 2004), is related to the fact that VTs

> "*can be composed of the best individuals for the task regardless of their physical or organizational location, thus enhancing the quality of decisions".*

Another positive aspect is the VEs' ability to reduce learning-coordination costs (e.g., travelling and coordination).

Entrepreneurial learning and VLE offer an attractive and evolving combination that challenges us to explore and create new learning ways (Peter et al., 2008). New ways of learning mean increased possibilities for entrepreneurs acquiring knowledge. This is the startup's most valuable asset because it is embedded in operational routines and dynamic learning processes that are hard to imitate (Wasko et al., 2005). Hence, it is beneficial for this research to understand how the virtual environment can converge with accelerators at the cohort and training levels.

2.7.1 Virtual Cohorts

A community is a group of participants, interactions, and social presence within a given learning environment (Sadera & Robertson, 2009). Accelerators cohorts are a based-community environment where entrepreneurs engage and learn with each other (Drori & Wright, 2018). In a virtual setting, one could ask if it is possible to create a sense of community and how the cohort impacts learning itself.

A virtual community can be defined as a group of participants in a distance-based environment with a shared purpose and relationship, including their sense of belonging, trust, and interaction (Sadera & Robertson, 2009). These three last components are critical to knowledge-building since scholars have pointed out a perceived sense of community as very helpful in terms of the learning experience (J. S. Brown & Duguid, 2001; Song et al., 2004). For instance, interaction in distance education influences learning due to the positive impact on feelings of isolation, therefore, contributing to the students' success in online environments (McInnerney & Roberts, 2004). Also, this need and importance of connection among peers are reflected, for example, when Barcelona (2009) asked a group of new online graduate students about their first experiences with online learning:

> "*The support [of peers] is very effective. Most of us communicate outside of [class] and keep each other on schedule and our 'heads in the game'! Without the cohort, I do not think that many of us would have stuck with it*".

Early studies (Sproull & Kiesler, 1991; Kiesler & Sproull, 1992) indicate increased difficulties in establishing and developing interpersonal relationships in computer-mediated interaction. They point to the lack of environmental features such as physical appearance, non-verbal cues of face-to-face meetings. Oppositely, Oren et al., (2003) claim the Internet's characteristics facilitate the development of unique forms of interpersonal and group interaction, for example, physical gestures are turned into digital gestures (e.g., emoticons). Therefore, social processes in virtual learning groups (Oren et al., 2003) requires further research.

In sum, the development of a community inside cohorts depends on an appropriate interaction among founders. Individuals in a community generally share something in common, and accelerators managers should foster this. Through interaction, similarities are found, and thoughts, feelings (R. E. Brown, 2001) and understandings are exchanged.

Even though a community takes more time to build in VEs (Greenberg et al., 2007), the relationship-building among the community remains one of the vital features of an accelerators value proposition. If not guaranteed, the learning journey inside cohorts might be weakened.

2.7.2 Virtual Training

Training is a mean to stimulate entrepreneurial learning. Consequently, accelerators provide entrepreneurs with educational seminars (Miles, 2017) for knowledge building.

This knowledge building among cohorts appears to be mainly based on a constructivist approach, since:

> "*learning is considered a social process that takes place through communication with others. The learner becomes actively involved in constructing his/her own knowledge by applying concepts to problems and/or formulating ideas into words, and these ideas are built upon through reactions and responses of others*" (Benbunan-Fich & Hiltz, 2003).

Whether it is asynchronous or synchronous, electronic training (e-training) should consider the contents of the training and the ease of use of the learning platform due to its impact on user satisfaction (Ramayah et al., 2011). Thus, online course design and teaching must take into account several factors and the transformation of interactions. For instance, regarding higher distance education, Rovai & Downey (2010) identified multiple modifications such as engaging students and effectively facilitating and moderating online discussions required specialized skills on the part of the teacher. Secondly, online teachers and students must develop personal

time management skills. Finally, online courses require technologically competent teachers that can use technology effectively to facilitate student learning.

Even if the content is well assembled and the technological infrastructure is implemented, one can ask about such environments' learning effectiveness. Research on online courses (asynchronous format) has found that students report similar levels of learning perception. These learning levels are regardless of delivery mode (traditional courses were compared to totally online courses and mixed-mode courses) and the course type (Benbunan-Fich & Hiltz, 2003). Also, Liu et al., (2007)' findings indicate that learners receiving web-based training achieved better learning performance than their counterparts receiving traditional classroom-based training.

Another positive aspect of e-training is that group activities are not limited by place or time boundaries, thus creating a learning atmosphere free from pressure and compulsion. Also, it enables the elaboration of each member's input to the group's work without the pressing immediacy so typical of face-to-face communication situations (Oren et al., 2003).

Accelerators transitioning to virtual training implies two steps. First, adapting the educational content for the virtual setting. Second, ensuring proper technological learning platform. If these steps are achieved, virtual training appears to be an effective way to provide one of the most valuable features.

3. METHODOLOGY

3.1 Research Approach

We followed an inductive case-study approach to explore how entrepreneurial learning is transformed within two core accelerators' learning mechanisms: cohorts and training.

Due to the lack of prior research on how EL and programs are being affected by the shift of accelerators to a remote format, a case study design seemed most promising to explore this thesis's research questions (Eisenhardt, 1989). The case study allows an empirical examination of a contemporary phenomenon in its real-life context, "*especially when the boundaries between phenomenon and context are not clearly evident*" (R. K. . Yin, 2003). Furthermore, it is useful to answer research questions of "how" and "why" and to develop new theories, rather than to test current theory (Eisenhardt, 1989). Finally, this research approach implies a detailed, in-depth data collection involving multiple sources of information (e.g., observations,

interviews, audiovisual material, documents and reports). It reports a case description and case-based themes (Lewis, 2015)**.**

A core criticism of the case study research is related to the results not being generalizable to the population (Woodside & Wilson, 2003). In other words, results are very context-specific. It is however possible to overcome this challenge by applying a multiple case study method, which typically provides a more substantial base for theory building (R. Yin, 1994). In sum, multiple cases enable comparisons that "*clarify whether an emergent finding is simply idiosyncratic to a single case or consistently replicated by several cases*" (Eisenhardt, 1991).

The research was the following. First, we performed a literature review to identify valuable theoretical insights from accelerators, entrepreneurial learning (EL) and virtual environments (VEs). This understanding of prior knowledge on how learning happens in accelerators and VEs provided the theoretical foundations for the thesis.

Second, an exploratory study was carried out to reconfirm the practical relevance of the topic. This implied an unstructured interview with an accelerator program manager to examine how accelerators reacted to the digital configuration regarding training and cohorts. Choosing an accelerator manager, instead of a mentor or founder, is justified by the clearer sight managers have concerning pre- and post-COVID programs. Beyond primary data, secondary data was collected from recent articles, interviews and documents on websites (Techstars, BGI, Y-Combinator, StartupBeat, Wired). The data collection is presented in the following sections. It allowed deepening the understanding of the impact on learning and virtual programs.

Third, it was then decided to focus on multiple international accelerators in different geographic regions (Europe, UK, Asia, USA and Australia) to improve generalizability.

Table 1 illustrates the study's research approach, which will be elaborated on in more detail in the following sections.

	Literature Review	Exploratory Study	Multiple Case Study	
			In-depth interviews	
Goals	Specify and delimit research areas Understand and analyse existing research Define literature gaps and formulate research questions	Reconfirm pratical relevance of topic Deepen understanding of how accelerators are dealing with COVID-19 and find insights on current remote programs	Construct relevant case studies Understand entrepreneurial learning and general changes in virtual accelerators	
			Startups Interviews Understand how peer-to-peer learning has been transformed with virtual setting	**Program Managers interviews** Understand how accelerators have evolved with COVID-19
Methods	Online database (Google Scholar) and books	30 min. unstructured interview with an accelerator Head of Marketing & Projects Secondary data (websites, interviews)	40-60 min. semi-structured interviews with 5 founders	40-60 min. semi-structured interviews with 9 directors

Table 1 - Summary of Research Approach

3.2 Exploratory study

On the 11th of March of 2020, the World Health Organization (WHO) declared COVID-19 as a pandemic. This changing moment in human history resulted from a highly contagious disease (Pascarella et al., 2020). Due to the current setting, people, businesses, and educational institutions had to adapt. In a nutshell, this adaptation meant shifting all communication and learning from a physical to a virtual environment on an untested and unprecedented scale (Avgerinou & Moros, 2020; Keshavarz, 2020). Accelerators were not immune to this shift and had to readapt their programs amidst a global health crisis, mostly by converting themselves to remote programs (StartupBeat Team, 2020).

Transitioning from physical to VEs, impacts interactions on multiples levels, including connecting, communicating and coordinating among all parties involved.

This exploratory study gives some hints on how digitalization impacts learning processes inside accelerators. The interview with Sofia Fernandes, Head of Marketing & Projects at Building Global Innovators (BGI), sheds light on how accelerators adapted to this new online setting (BGI is a global accelerator based in Lisbon and Boston). Along with the pandemic, there have been some informal discussions among stakeholders (e.g. Y-Combinator; TechStars; BGI) of

the entrepreneurial ecosystem, verbalizing how COVID-19 has impacted acceleration programs.

3.2.1 Social connection & Virtual Communication

From the accelerator perspective, Sofia Fernandes, addressed the challenge of giving a personalized interaction between the BGI team and the startups on a VE, referring the "lack of individual interaction" since they have "a lot of people in one [virtual] room at all times". Furthermore, at BGI, due to founders not being physically located in the same space, the quantity of feedback exchanged has decreased. Usually, a “peer review” about business pitches, marketing brochures, and other founders’ pitch would occur; however, it is harder for accelerators to recreate these interactions in a VE.

Ryan Kuder, Managing Director of the *Techstars Anywhere Accelerator*, Techstars' only remote accelerator, shares the concern about developing the same peer relationships that founders in traditional Techstars programs develop. However, in his view, this connection between founders is equally strong. Nevertheless, one should bear in mind that this specific program includes a gathering in person at the beginning, middle, and end of the program.

From the founder perspective, COVID-19 is somehow disturbing the dream of joining a cohort. *Carambat*, an entrepreneur applying to Y-Combinator, asserts "I don't need the money," but "I do really need the network." Like many other founders, *Carambat* questions the performance of a virtual accelerator, since, for him, the main value proposition of these programs is accessing an onsite "network of co-founders and people in the industry". Also, an article from *Wired* (2020) compares the VE with the face-to-face communication arguing that "*meeting people over Slack or a Zoom call just isn't the same as sidling up next to them at an intimate dinner".*

Finally, there might be a beneficial aspect of the virtual format concerning the location, which is the possibility of having more intercultural batches of startups, a benefit reported by Sofia Fernandes, Head at BGI. In 2020’cohorts, they received and accepted a wider pool of international startups, which might give founders a more diverse and innovative cohort.

3.2.2 Networking & Mentorship

There are optimistic and pessimistic perspectives of virtualizing learning' interactions in networking and mentorship, critical components of accelerators programs. Overall, informal

discussions point out a trade-off between the intimacy of in-person contact and online flexibility (Kuder, 2020).

On the optimistic side, since founders have high flexibility, it allows creating networks of investors and mentors that are not as regionalized, according to Sofia Fernandes, Head of BGI. Therefore, this broader exposure might improve the quality of learning among entrepreneurs. Also, Kuder states that

> "it is easier for mentors to engage when they don't have to block out days for travel, they don't have to go anywhere, that they can have a half-an-hour call in between other half-an-hour calls".

In other words, a facilitated ability to schedule meetings might increase the quantity of founder-mentor learning engagement.

On the pessimistic bloc, Sofia Fernandes, reports that one significant challenge of VEs is facilitating networking moments between mentors and founders, for instance, the ability to replicate informal networking such as a dinner. These learning opportunities do not take place in a VE.

Peter Pakalski, an operating partner at Epione Ventures, a small venture capital firm, reveals that virtual programs are "hardly ideal". By referring to Y-Combinator, he continues that "it'll be much harder to build rapport and build a network". As seen before, cohesion is an essential factor for performance. Therefore, a lack of social connection might be detrimental to learning.

3.2.3 Engagement & Training

Regarding training, Sofia Fernandes, Head at BGI, points out how VEs have brought more challenges than benefits.

On the one hand, during training or one-to-one sessions, founders seem not to pay so much attention to what is happening in the moment as they would in a face-to-face meeting. Sofia confesses that founders' attention seems to be diminishing as she competes with other virtual distractions (notifications, emails, social media). Also, during training sessions, there appears to be a higher tendency for multitasking (listening and reading emails with webcam off) which can compromise learning retention. On the other hand, Sofia refers a great benefit provided by communicating primarily via online: the ability to record the entire content from training

sessions, therefore, building a vast video library that can be consulted, curated, and used at any point.

In sum, digitalization is transforming various learning mechanisms of accelerators. However, we do not know how and if this a positive, neutral, or negative transformation. We aim to find if and how virtual programs can put at stake the acceleration of entrepreneurs learning and what changes they force program managers to face. Below is the summary of the exploratory study, stating what is lost and gained with the virtual setup.

	Virtual Environment	
Learning Interaction	**+**	**-**
Program Manager to Founder		**Individual Interaction**
Founder to Founder		**Informal Feedback**
Founder to Founder	**International Cohorts**	
Mentor to Founder	**International Mentors**	
Founder to Accelerator		**Networking**
Founder to Program Manager		**Engagement**
Program Manager to Founder	**Training Materials Recorded**	

Table 2 - Overview of the Exploratory Study

3.3 Sampling

Using a case study method demands a careful selection of cases. They should produce similar findings or predictably contrasting ones (R. K.Yin, 2003). This research aimed to analyze the VE's effect on cohorts and the program itself. Therefore, our case-study focused on conducting semi-structured interviews with five founders and nine program managers from nine different accelerators. The sample was composed of 14 individuals, being 36% males and 64% females, approximately. It was a highly diverse sample in terms of countries, ranging from Portugal to the USA, including the UK, China, Malaysia, Australia, and the Netherlands.

First, the founders' perspective provided us with how peer-to-peer learning and interaction changed with the transition to a VE. Alongside, in order to validate these results, a pre- and post-COVID-19 point of view was needed. The pre-COVID-19 perspective was based on

current literature, namely Cohen (2013) and Garcia (2017). The post-COVID-19 point of view was collected by interviewing founders who participated in accelerators' programs during the pandemic. Second, program managers were also interviewed to show how accelerators have changed and readapted with the remote transition.

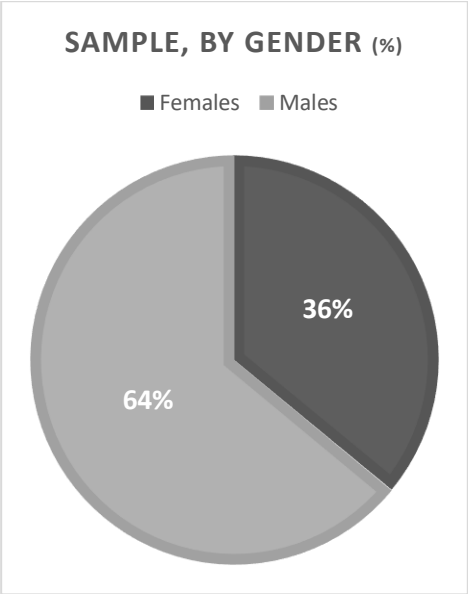

Figure 2 - Sample details | Gender

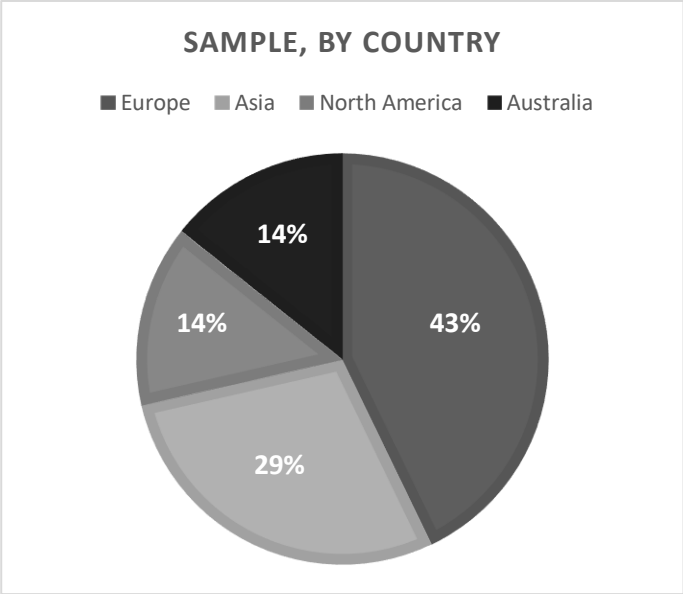

Figure 3 - Sample details | Country

3.4 Data Collection

Primary data was collected from real-time sources, including transcribed and retrospective semi-structured interviews. To increase data richness, primary data was enlarged by secondary data, allowing for data triangulation (Bryman, 2012, p.392). An exploratory study allowed to reconfirm the practical relevance of this multiple-case study, which was then complemented with data from accelerators' webpages, published interviews and articles. This multi-faceted data collection strategy afforded multiple triangulation types, thus improving results' reliability and credibility (Yin, 2009).

The primary data sources were derived from in-depth interviews with accelerator program managers (1 per accelerator) and founders of graduated ventures or currently in program (1 per accelerator). This data collection procedure facilitates comparability as interviewees answer the same questions. It also ensures flexibility as it allows the researcher to deviate from pre-defined questions as soon as unexpected aspects are revealed (Bryman, 2012). Approximately 14

interviews were conducted over videoconference, lasting between 45 and 60 minutes. We used two interview guides, one for program managers and other for founders. The interview guides were defined based on Cohen (2013) and Garcia (2017) prior research on accelerators, learning and cohorts. Each interview guide, which included open and closed-ended questions, was divided into four sections: background information; the general impact of virtualization on learning; specific impact on cohorts and training; perceived benefits and challenges of virtual accelerators.

Several additional precautions were taken to reduce bias. All interviews were recorded, fully transcribed, and analyzed. All interviewees were guaranteed anonymity and confidentiality to improve the integrity of responses. Finally, to improve recall, interviewees selected were all highly and recently involved with this research context either as program managers or founders.

3.5 Data analysis

The data analysis for this study was conducted over numerous stages, which are described below. First, the interviews were fully transcribed and carefully read multiple times (Shaw, 1999), to become more familiarized with the dataset (Braun & Clark, 2006). Then, as defined by Strauss and Corbin (1990, p.61), we examined, compared, conceptualized, and categorized the transcripts. Throughout the interviews, specific information emerged, which implied a codification and organization in multiple clusters. This was an essential step of our inductive, qualitative data analysis (Eisenhardt, 1989). First-order concepts were derived from codes that constituted short descriptive sentences (Corley & Gioia, 2004), then grouped into second-order themes according to existing literature. Finally, these themes were divided into two research dimensions, the founder performance, represented by founders, and accelerator performance, represented by program managers.

Given the scarce or even nonexistent prior literature on virtual accelerators, this data organization allowed us to build an explanatory framework on how virtual accelerators impact founders' learning experience and understand the challenges and benefits of the virtual model.

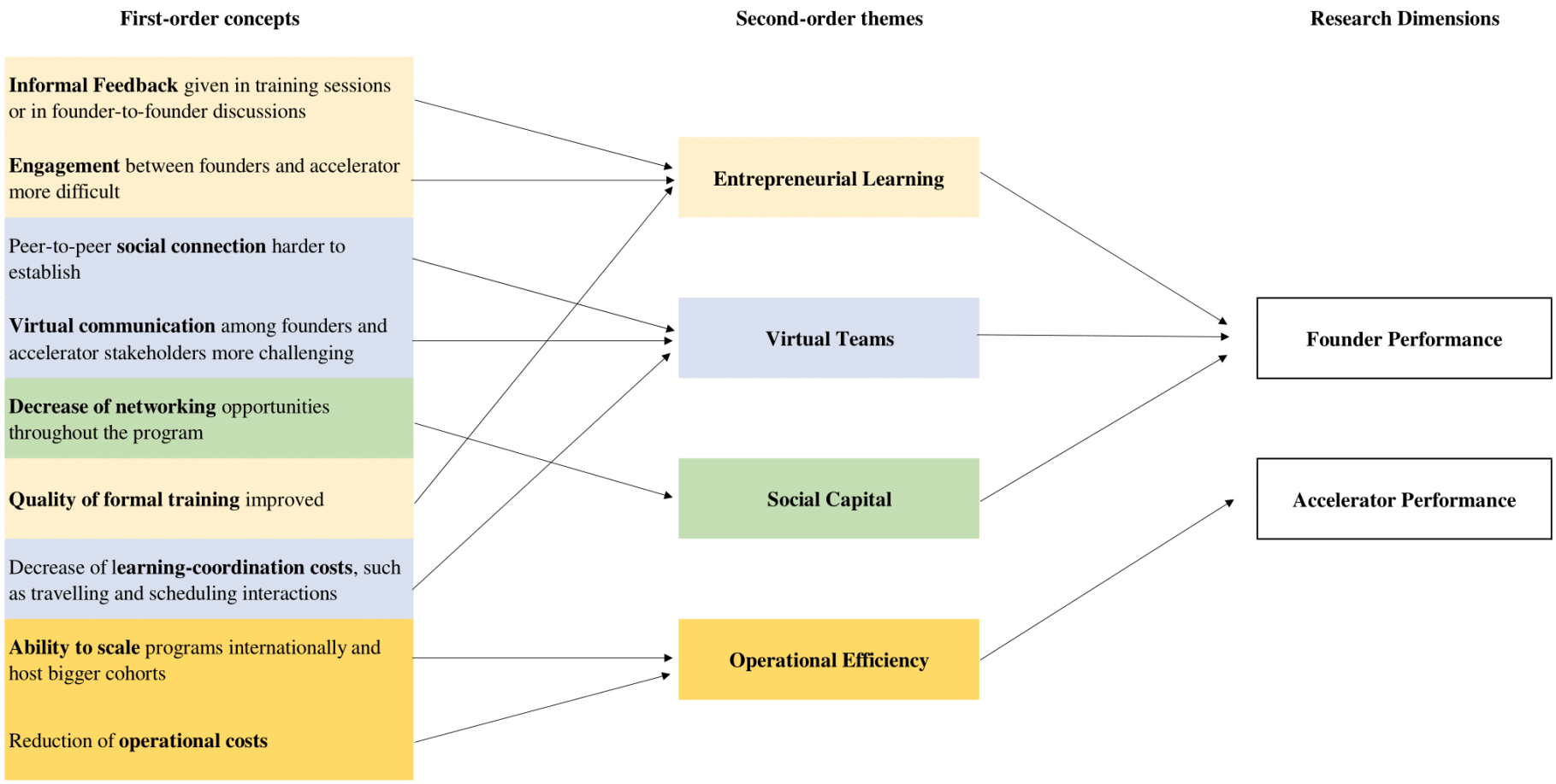

Figure 4 - Data Structure

4. RESEARCH FINDINGS

The following section presents the empirical findings regarding the existent trade-off in virtual accelerators (VA): efficiency performance versus community performance. The benefits and challenges are addressed. Part of the corresponding direct quotes is translated from the original Portuguese statements. Also, the conceptual framework is presented below.

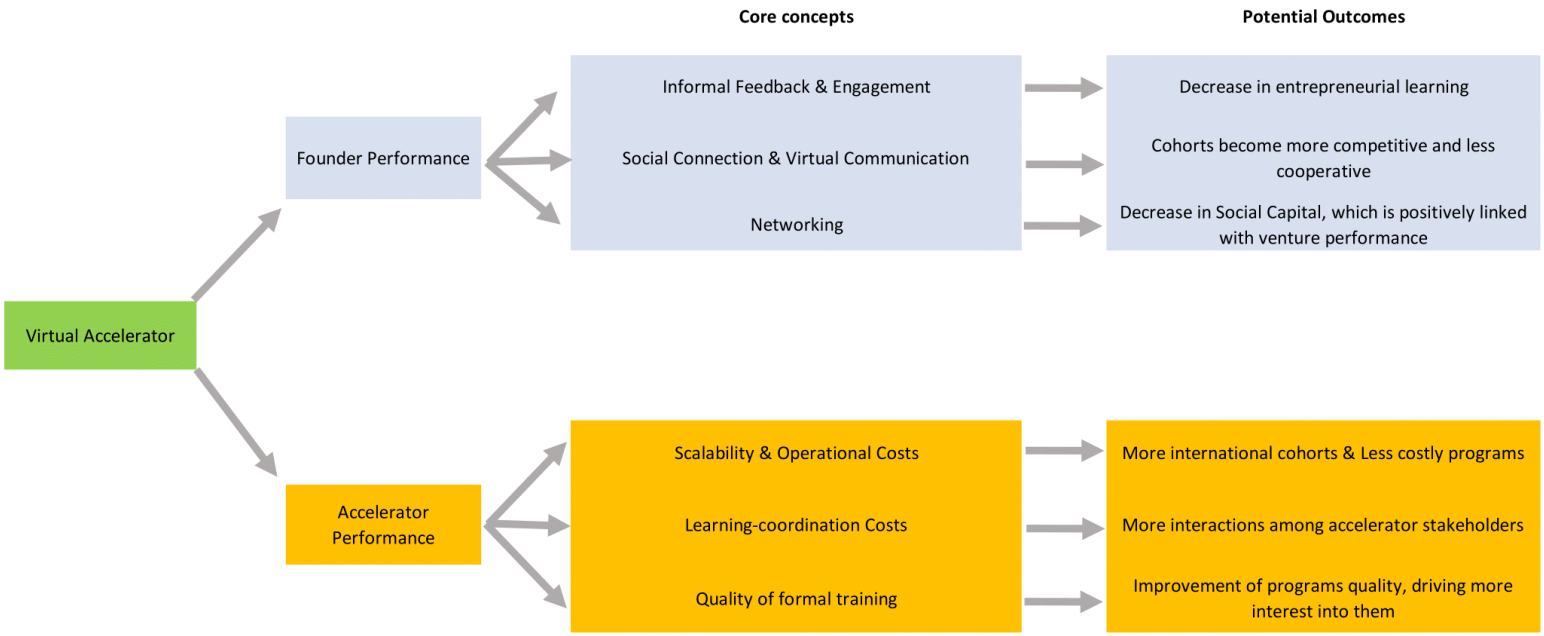

Figure 5 - Conceptual Model

4.1 Accelerator Performance

4.1.1 *Scalability*

Scalability, the ability of a system to grow larger (Cambridge Dictionary, 2020), was mentioned by program managers as the main change. Accelerators now have more capacity to accept more founders to the programs. As a founder of an EdTech accelerator remarked:

> *"[…] it can be way more scalable. So we don't have a limitation to only take ten founders. We could take two hundred thousand if we wanted to."*

Not only can the accelerator accommodate a higher number of applicants, but it can also increase their geographical reach. Cohorts become more international, which can be noted as beneficial for the participating founders as it enriches the different perspectives each brings to the program. A Portuguese program manager pointed out to *"[…] a broader geographical reach in terms of applicants"*.

4.1.2 *Learning-coordination costs*

Another critical aspect mentioned by founders was reducing the learning-coordination costs, which are defined "*as the expenditures such as time or money required to set up learning*" (Cohen, 2013). In a virtual accelerator, learning-coordination costs such as scheduling interactions and travelling before learning interactions are immensely reduced. Concerning the training sessions provided by the accelerator, one Australian founder stated:

> *"What I enjoyed the most is that I could relax, like I was in my office, so it didn't feel like I was wasting any time, you know, catching flights or booking accommodation, like there was a lot of time efficiency and just the comfort of being able to do it from your office was really convenient."*

Beyond travelling costs and time, others mentioned easiness of scheduling virtual interactions with mentors. In other words, the coordination of interactions happening at the accelerator level was more manageable and efficient:

> *"But we just wrote the organizers: [founder] Can we have a coaching session about this scheduled? And they were like: yes. And they moved things up. And then 15 minutes later, we had a call [with an expert]."*

In the same line of thought, when asked about the advantages of having virtual mentorship, a program manager explained that *"if is there anything, is a higher reach to mentors and advisors and is easier for everyone"*.

4.1.3 *Operational costs*

Face-to-face acceleration programs imply various logistical arrangements, such as coffee breaks and workspace rental, which increase the operational cost. The transition to online programs allowed to eliminate multiple costs associated with the program:

> *"I am remembering the last acceleration program in which we had startups from the UK and Germany. We had to organize everything from accommodation to transportation, including meals. All of that, reduce the amount of logistical and financial work a program implies [about online programs]."* (Portuguese program manager)

Similarly, an Australian program manager mentioned one positive aspect of virtual programs as being *"less costly... since we do not have to pay meals, coffee breaks and space rental*".

4.1.4 *Formal Training Quality*

Accelerators provide critical training, hence being recognized as *"authentic learning experiences for nascent entrepreneurs"* (Miles, 2017). Educational seminars cover a broad spectrum of topics, ranging from Message Validation to Lean Startup Methodology, including Customer Development (Barrehag et al., 2012). Some changes have been applied to how these seminars are provided, such as content selection and training duration. For example, the training became shorter in duration, which forced program managers only to choose the most valuable concepts and build more structured workshops:

> *"We shifted everything virtual and yeah, I guess bringing more structure to things. More structure, in terms of kind of the workshops."*

Time-constrains forced program managers and founders to be more mindful in creating an excellent fit between the training's goal and the startups' needs. Consequently, this generated better learning experiences, which was proved in an improvement of the training reviews:

> *"[…] so our workshops are way better than before, than we did them offline because they are better documented. And the training materials, more thoughtful, like every five minutes, is thought about. And that improves a lot. So we got a nine and half out of ten for the first training that we organized. It is higher than before. It used to be seven or eight."*

4.2 Founder Performance

4.2.1 *Informal Feedback*

Informal feedback refers to the knowledge spillovers that happen through peer-to-peer information sharing, helping founders find solutions for everyday problems (Barrehag et al., 2012). This information sharing allows teams to avoid making the same mistakes and, for instance, improving their pitches (Miller & Bound, 2011). Hence, in a classic accelerator, cohorts are groups of startups who "learn in tandem" (Smith & Hannigan, 2015). However, in a virtual accelerator, this learning setting is much harder to replicate.

Physical space: program managers think onsite accelerators are much more prone to information sharing in comparison to a virtual format, therefore enhancing learning:

> *"[about onsite programs] Undoubtfully, the environment is much more favourable to sharing knowledge, experience and ideas...If I am in the same workspace of another startup, it is obvious that I will ask "Hey, you have been through this process, which difficulties did you feel? What must I be cautious about?""*

Peers review: founders confirmed this point of view and mentioned the struggles to engage in this precious informal feedback with peers as a way to share knowledge and learn from each other:

> *"We had moments for discussion however one virtual room was to meet mentors and the other was where all founders were… it was difficult to chat privately with other founders (…) and give feedback about their work."*

Training sessions: concerning onsite training sessions, the ability to reach out to speakers privately in a more informal manner was pointed as a benefit of having onsite training sessions, which in virtual training is very difficult to reproduce. A Portuguese Accelerator Director explained:

> *"[about onsite programs] There is that question of validation... and in a training session I might not be comfortable to validate a certain obstacle I am facing, however, maybe after the end of the session I talk to the speaker or mentor in private. And I have a much more tailored conversation and he/she will speak in a more informal way."*

4.2.2 *Engagement*

The literature on electronic media has pointed out that an individual's involvement in the communication process could decrease (Hinds & Kiesler, 1995). As being occupied with something or having full attention, lack of engagement was pointed out by program managers. The emphasis was on the accelerator ecosystem as a whole, where the attention span decreased, given the virtual context. This perception is in accordance to the exploratory study. It demonstrated that founders seem not to pay so much attention to what is happening in the moment as they would in a physical meeting:

> *"People aren't so engaged; it is not the same thing compared to when a person is completely absorbed...because in online I am here right now, then we are done, and I am off to another thing. If I travelled to Sydney during the week, it would be much harder to do other things (...) I am focused because right after we have a cocktail, or a dinner and you are much more in "the zone" and "in that bubble"."*

Also, program managers mentioned that Demo-Days were a superior difficulty, revealing the struggles to generate an engaging virtual Demo-Day where networking and potential investments arise:

> *"A disadvantage we also felt was the demo-day online. It's hard for everyone. I've spoken to many accelerators and is really difficult to have engagement...one thing is having views in the videos, another is having a true investors engagement, which is the ultimate goal."*

4.2.3 *Social Connection*

In accelerator programs, the ecosystem is built on the multiple connections each stakeholder engages in. For this reason, the relationship-building among the community remains one of the vital features of an accelerators value proposition. Research has shown the value of face-to-face meetings in establishing a significant social connection between members (Robey et al. 1999). The literature on assessing fundamental processes that foster team effectiveness, mentions relationship building as critical (Klein et al., 2009). Concerning virtual accelerators and the process of building relationships, both founders and program managers shared how challenging it was to experience the sense of community cohorts usually have in physical programs:

> *"Yeah, so, yeah, I think that's the downside. The interaction between virtual cohorts is the downside between cohorts, because, as I said, that's the social aspect. This is the thing that we lost."*

> *"So you're having, like, I don't know, a talking session about something. They [program managers] give you a topic, or they make you do an active listening exercise or something like that. And then you would get to know the other person [a founder]. But still, you wouldn't keep in touch that actively with them because you don't know them that well in person. I guess that's still the barrier".*

> *"You sort of work out what people are like. You work out what the mission is. You work out a little bit about the operating style, but I don't think you build any relationships."*

4.2.4 *Networking*

Networking is also one of the leading value propositions of accelerators. Whether it is done with founders, mentors or investors, networking events facilitate peer-to-peer collaboration and often expose the learners to new opportunities (Miles, 2017). Also, to increase startups' social capital – "*an investment of social resources with expected returns, directly or indirectly anticipated, now or at some possible future time"* (Anderson et al., 2007) - founders have to engage in networking to unlock or gain access to other resources. In a virtual accelerator,

networking might be in jeopardy. Founders and program managers mentioned the inability to connect with other stakeholders. A Portuguese program manager explains:

> *"[about virtual program] This learning model is much more unidirectional. And so, I can have more learning opportunities, more events, more training sessions, however, that is much more unidirectional, and therefore you lose (...) the informal networking done after the training sessions."*

4.2.5 *Virtual communication*

When communicating, using technology-mediated is often viewed as highly impersonal since it lacks the richness of face-to-face communication (Lengel & Daft, 1984) - social, visual, and aural cues (Siegel et al., 1986). Virtual communication appears to have some obstacles when it comes to group discussions and coordination among members. A program manager demonstrated:

> *"[about virtual communication] If this is already difficult in a one to one conversation, with a group its chaos. One thing is having a room with 25 founders and people organize themselves to speak, and another is being here having to raise a hand to speak. The trainer has to see if someone has raised any hands... then you have to understand which of the hands was raised first... this is much slower and difficult."*

5. DISCUSSION

The following section outlines the meaning of the empirical findings and derives theoretical propositions. Unlike prior research on accelerators, this thesis focuses not only on the accelerator-level but also on the founder point of view. It explores a very recent phenomenon triggered by COVID-19: accelerators changing from onsite programs to remote ones. The study outlines this transition's impact on accelerator's *modus operandi* and the founder's learning experience. It specifies how the virtual format dictates what is lost (informal feedback, social connection, and networking) and gained (operational cost reduction, formal training quality) in an acceleration program. An interesting aspect that emerged from the interviews is related to a

higher acceptance of program managers to hybrid programs due to seeing some benefits of the digital mode. The literature on the hybrid format is lacking; however, a study on designing corporate accelerators reminds that the *"accelerator should be combined with in-person sessions to tackle the disadvantages of virtual communication"*(Kohler, 2016). This recommendation indicates the importance of combining virtual and face-to-face moments throughout hybrid programs.

5.1 Accelerator Performance

First, at the enterprise-level, some upsides were revealed. Scalability was mentioned as an advantage as well as an opportunity when having virtual programs. Scalable programs might translate to being able to produce more with the same resources, which, in this context, means "hosting" more prominent and international cohorts, as the commuting factor is removed from the founders' decision-making. Virtual programs can reach more geographic regions, creating a multi-cultural batch of entrepreneurs associated with higher capacity to solve complex tasks and find more innovative solutions (Gaganis et al., 2020). However, program managers should carefully manage VEs as it has been linked to the struggles VTs face when coordinating across time zones, cultural divides, and divergent mental models (Maznevski et al., 2000). On top of scalability, virtual programs are less costly, translating in increased efficiency and effectiveness of the accelerator team, especially in allocating knowledge-based assets (Carayannis & Von Zedtwitz, 2005). Hence, the scalability and cost-efficiency associated with the virtual setup can propel the emergence of hybrid accelerators, where program managers try to combine the benefits of the virtual and face-to-face worlds.

Finally, if accelerators decide to scale programs to reach different markets, they will grow a more robust network and business expertise. The ability to differentiate themselves in a global market and attract more founders and strategic stakeholders will be achieved through specialization (e.g., industry focus or venture stage).

Proposition 1:

Virtual acceleration programs tend to be more a) scalable, b) low-priced c) specialized than face-to-face programs.

As one of the key value propositions of accelerators (Seet et al., 2018), training improved with the transition to a virtual format. Due to the virtual setting's inherent lower attention span

(Malhotra et al., 2007), program managers had to filter and rethink training sessions, leading them to be more mindful on the content provided to founders. This filtering caused more tailored and relevant sessions, serving the founders' needs even better from the founder perspective. Consequently, one can say virtual training leads to higher specialization of learning. Besides this change, the learning-coordination costs – which are the *"expenditures such as time or money required to set up learning"*(Cohen, 2013) – were immensely reduced. The ability to receive the training sessions from their location was a comfortable and convenient advantage. As a whole, training quality improved, which had positive consequences on the founders' learning satisfaction. This improvement might drive program managers to keep training in a virtual format, even with the transition to a physical environment, possibly giving birth to hybrid programs.

Proposition 2:

Founders experience higher learning satisfaction in virtual accelerators than in face-to-face training programs.

5.2 Founder Performance

The results indicate that both founders and program managers perceive the virtual setting as a barrier for informal feedback. This feedback, which happens on a founder-to-founder level, is regarded as very necessary since *"they give each other technical, programming, and business feedback"* (Mejia & Gopal, 2015). Previous research illustrates cohorts as a peer support group. By spending time in the same building and meeting each other regularly, founders provide each other with meaningful support (Miller & Bound, 2011), enhancing entrepreneurial learning. For instance, Garcia (2017) identified three levels of learning present in cohorts: benchmarking peers' best practices; identifying mistakes, avoiding failed strategies; and combining knowledge and experiences to find solutions to mutual problems. However, this knowledge sharing is harder to reproduce in virtual programs as founders are not located in the same workspace or do not actively engage with each other due to communication constraints. All things considered, since in-depth peer-to-peer feedback decreases one can say that learning derived from those interactions is also lost, therefore reducing founders' vicarious learning.

Proposition 3:

Virtual acceleration programs decrease in-depth peer-to-peer feedback in comparison to onsite programs, therefore, affecting vicarious learning.

Building relationships and achieving the social connection between the cohort was more challenging in a virtual program. Our findings are in line with literature on virtual teams. When developing relational intimacy in a computer-supported setting, teams need a longer time to build close relations than face-to-face (Chidambaram, 1996). As such, social connection is more difficult to establish between founders. Consequently, the cohort does not transform into a virtual community which is:

> *"A group of participants in a distance-based environment with a shared purpose and relationship, including their sense of belonging, trust, and interaction"* (Sadera & Robertson, 2009).

Research shows that these three last components are essential to knowledge-building since a perceived sense of community is very helpful in terms of the learning experience (J. S. Brown & Duguid, 2001; Song et al., 2004). For example, a sense of belonging is described by Politis et al. (2019) as a

> *"facilitating condition for entrepreneurial learning in acceleration programs triggering and strengthening the grasping dimension in the experiential learning process".*

Trust is also vital since when entrepreneurs build trust with one another, they can *"experience cognitive, emotional, and social changes"*, bringing potential consequences for exploiting opportunities (Bergh et al., 2011).

Finally, interaction is the leading vehicle to transform the cohort into a community, where founders found similarities and exchange thoughts and feelings, hence, stimulating learning and knowing (Sadera & Robertson, 2009).

If the cohort does not experience a sense of belonging, trust and interaction, learning from each other might not be enabled.

Proposition 4:

When compared to face-to-face programs, virtual communication makes the social connection among founders harder to establish, demanding a higher effort and time on them.

It was found that social networking moments are reduced in a virtual program compared to a physical program. Social networking is a mean to enhance the entrepreneurial venture (De Hoyos-Ruperto et al., 2013); thus, reducing this critical element of accelerators affects the founders' learning experience. Due to the virtual setup, moments of interaction with investors, mentors and other peers are reduced (BGI, 2020). The literature demonstrates how social capital and entrepreneurial performance are positively linked (Batjargal, 2003). For instance, having a strong network in the financial community is positively associated with the knowledge of finance alternatives (Seghers et al., 2012). Therefore, having fewer moments to networking might prevent founders from extracting all the value embedded in the accelerator network.

Proposition 5:

Virtual acceleration programs have fewer moments of social networking compared to face-to-face programs, which can prevent founders from accessing valuable funding sources.

Our findings suggest a significant conclusion about the impact of virtualizing programs: challenges for the cohort are more significant than the accelerator's benefits. Hence, moving programs fully online might not be the best solution for founders and program managers. The most relevant argument is related to the community hindrance that virtual accelerators provoke. The virtual setting creates obstacles for a constructive learning and community experience by reducing peer-to-peer feedback, networking and making the social connection more challenging. Even if there are operational advantages, such as reducing operational and learning-coordination costs or programs being more scalable, what is gained virtually does not compensate what is lost when in person. Concluding, the existent efficiency/community trade-off compromises founders' vicarious learning. However, this trade-off might be mitigated with hybrid programs, where the community enhancement is done face-to-face whereas training and daily meetings are carried out on a virtual basis.

Proposition 6:

Virtual model benefits accelerators at the operational level; however, hinders community building. Therefore, virtual accelerators present an efficiency/community trade-off.

5.3 Theoretical Implications

We contribute to the literature by testing entrepreneurial learning in a virtual environment. While previous literature identified that classic accelerators are important to entrepreneur's growth by learning vicariously (Politis et al., 2019), accelerating social networking (Drori & Wright, 2018) and having training experiences (Miles, 2017), our study shows implications to such learning vehicles. For instance, concerning vicarious learning, we found evidence of how the virtual format decreases social connection, feedback, and networking. Literature show that there is less participation in virtual communication (VC) than in face-to-face (FTF) communication, "*perhaps due to dissatisfaction with current VC technology or the "staged" feel of a videoconference-room meeting"* (Wainfan & Davis, 2004). Another effect of virtual communication on group dynamics is a reduction in cohesiveness (Yoo & Alavi, 2001), affecting founders relationship building and social connection (Powell et al., 2004). The results on decreasing engagement levels are also in line with previous research, which states that "*virtual team working may be associated with lower levels of energy and vigour*". These consequences are caused by the format itself and working with different times zones or having distinct cultural values (Cordery & Soo, 2008). Our findings contribute to understanding how the virtual format makes more difficult for founders to take advantage of accelerator's learning vehicles such as feedback and networking.

Our study also contributes to the literature on virtual teams (VTs). Our findings point to a new direction and avenue of VTs. As information and communications technology improves and generations get more used to virtual environments, we show that virtual training is an element contributing to founders' positive experience of learning. Literature tells us the perception of the training quality and effectiveness is influenced by the amount of "*communication among students and between students and the instructor*" (Peltier et al., 2007), which confirm our findings since program managers and founders are highly involved during training sessions. However, research on virtual training effectiveness must be developed as a consensus is not clear (Kumar et al. 2001, Kim et al., 2005).

Finally, the reduction in learning-coordination costs demonstrates how accelerators provide more beneficial experiences for founders learning. This complements findings from Cohen (2013) on classic accelerators, but we bring a new perspective on understanding how this aspect is leveraged in a virtual format.

5.4 Managerial Implications

Within virtual acceleration programs, this study provides valuable practical guidance for both program managers and startup participants.

First, the results show that social connection among founders is more challenging in a virtual format. Accelerators managers should design programs in a way that promotes extensive peer-to-peer interaction, wherein one-to-one or small group sessions founders have the opportunity to build relationships and connect on a personal level. For example, replicating accelerators workspace can be done by having a "virtual office" where founders are connected via a video conferencing platform, entering a virtual room to engage in a private conversation. Alternatively, having a virtual "meals room" can also generate those moments of informal interaction, where founders build relationships. As they have higher interaction levels, trust gains momentum and feedback concerning each others work will arise, therefore, program managers can expect to see an increase in the founder's satisfaction and learning experience.

Other team-building tools can be considered, such as *Donut,* which makes it easy to launch virtual coffee or group lunches, encouraging peers to meet for learning opportunities, and building important internal networks. Also, *Mystery Minds,* allows for meaningful connections in any organization, thereby enabling stakeholders to access their full potential and take pleasure and enjoyment in their daily challenges.

Second, as networking was pointed out as one of the struggles in virtual programs, accelerator managers should empower networking amongst founders. This goal can be achieved by having weekly networking moments. For example, they can use AI match-making software, such as *Brella* or *Shapr*, to connect founders' needs and characteristics to specific investors, mentors, and program alumni. For instance, *Brella* has a feature called "*Event Matchmaking*" where during virtual events suggests people to meet based on mutual goals and interests. Regarding *Shapr*, it can be used on a daily basis by founders since the machine-learning algorithm suggests 15 relevant people to meet each day, allowing only a match when the interest to connect is mutual. By increasing networking moments, program managers should expect to see founders more satisfied and an ecosystem much more engaged and connected.

Some changes are expected in acceleration' programs, one of them being the emergence of hybrid acceleration programs. It is expected for program managers to adopt some virtual format benefits, such as virtual training. We will increasingly see accelerators offering part of the program face-to-face, such as networking moments and exclusive events and the rest in a virtual format since it reduces operational and learning-coordination costs, for accelerators and founders, respectively. It is advisable to have bonding interactions at the beginning of the programs to ensure the cohort transforms into a team, which will improve virtual interaction further in the program.

6. CONCLUSION

This thesis was intended to shed light on the sudden expansion of virtual accelerators. The study focused on understanding two aspects of the transition from face-to-face programs to a virtual setting: a) founders' perception of the learning experience and b) the benefits and challenges associated with online-based accelerators. An exploratory study revealed some of the benefits and challenges program managers and founders are currently experiencing. On the one hand, lack of engagement, networking and individual interaction was mentioned. On the other hand, the easiness of coordinating stakeholders' interactions, such as connecting mentors with founders, and having more scalable and low-cost programs that can reach new regions of the globe was described as benefits. The primary study consisted of a multiple case study whose findings suggest a conceptual model, displaying the founder and accelerator performance within virtual accelerators. It outlines the main benefits and challenges managers and founders face when in a virtual format. Concerning founders, *informal feedback & engagement, social connection & virtual communication* and *networking* are the prevailing challenges. For program managers, *scalability & operational costs*, *learning-coordination costs*, and *formal training quality* were the most beneficial elements. This study's primary takeaway is the community/efficiency trade-off, where fully online programs are more damaging for founders' learning experience than beneficial. What virtual accelerators gain concerning enterprise efficiency, by reducing several operational and learning-coordination costs, they lose in community involvement and engagement. The findings on the founders are that the social connection, virtual communication, and networking are arduous to replicate in a digital environment. However, on the program manager's side, training gains quality since digital sessions have to be shorter; hence, they are very well thought-out and tailored to the founders' needs. Beyond that, programs become more scalable and less costly for accelerators and

founders in a virtual environment. In the long-term, we can expect an increase in hybrid accelerators, where program managers try a beneficial combination of the virtual and physical worlds. Therefore, we propose a hybrid model as the best format to enhance the accelerator's efficiency and effectiveness as an enterprise while simultaneously providing founders with the knowledge and learning spillovers inherent to a cohort interaction. Accelerators that adopt a flexible mix of both real and virtual interactions will earn a competitive advantage in the New Economy, as markets and ventures become globalized.

Even though there were virtual programs before, COVID-19 forced an unprecedented and inevitable shift in the way accelerators operated. This study contributes to understanding an emerging phenomenon: virtual accelerators. First, it contributes to program managers to be aware of the virtual environment's benefits and downsides and give them insight into how they can address the main challenges. Second, it helps founders choose virtual acceleration programs that favour and foster community elements, vital for entrepreneurial learning. The findings help comprehend how peer-to-peer interactions are transformed remotely and what can be done to ensure that accelerators' stakeholders are fully connected and coordinated.

Given that virtual accelerators are a recent emergence, there is still high uncertainty about many aspects of this relatively new format. With its further expansion, it remains to be seen whether virtual accelerators can adapt and create added value for entrepreneurs, maximizing entrepreneurial learning and achieving business success. If program managers approach the virtual environment with creativity, strategic focus, and pragmatism, it is still possible to offer the best entrepreneurial learning experience.

Limitations and Future Research

The empirical results reported herein should be considered in light of some limitations. The conceptual framework can only display the first suggestion, and corresponding propositions should be reinforced and quantitatively tested in future studies. Firstly, the sample size, which included five and nine interviews with founders and program managers, should be enlarged in future studies to generalise results. Also, to fully extract the benefits and challenges of virtual accelerators, mentors and investors should be considered in future research. Secondly, we conducted a multiple case study through interviews, which can influence the final results. This method can suffer from the unintentional manipulation of data from the interviewer and interviewee due to biases, such as selective memory, and misinterpretation of meanings and

concepts. Thirdly, to compare face-to-face programs with the virtual format, a control group should be used. Finally, the lack of previous research on virtual accelerators also can be considered a limitation.

This dissertation is the initial step in investigating how virtual accelerators impact the learning experience of founders. Also, it seeks to define the significant benefits and challenges of the virtual model. However, literature is lacking, and there is a need to conduct more research. In interviews with program managers, it was stated how hybrid programs (virtual plus face-to-face) could arise after the virtual model. Beside virtual accelerators, future research should be done to understand the defining aspects of hybrid programs and their impact on founders' learning experience. Second, considering our conceptual framework, further research should address how each core concept is impacted in the virtual format. Lastly, quantifying outcomes in virtual accelerators, such as follow-on investing and venture outcome, in comparison to the physical format, is also an avenue for future studies.

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8. APPENDICES

APPENDIX A: Program Managers | Interview Guide

SECTION 1 – CONTEXTUALIZATION OF INTERVIEWEE (5 Minutes)

I want to start by asking you a few questions about your background and your accelerator's background.

- Can you briefly tell me the history of your accelerator? (When/why founded (goals), changes along the way)

- Can you briefly tell me about your background? Why did you start/join the accelerator?

SECTION 2 — UNDERSTAND GENERAL IMPACT OF VIRTUALIZATION ON LEARNING (10 Minutes)

- Can you describe your program from application to Demo Day, elaborating on what happens for each part of the program? (each month or phase)

- At ACCELERATOR, what you would say changed the most with COVID-19? Can you explain it? What parts of the program have changed with COVID-19? Why did you decide that?

- During the program, when do you think startups make the most progress? Could you explain how and provide me with some examples?

- And what about learning? When do you think founders learn the most? Could you explain how and provide me with some examples? Why?

SECTION 3 — UNDERSTAND IMPACT OF VIRTUALIZATION ON THREE CORE LEARNING MECHANISMS OF ACCELERATORS (30 Minutes)

3.1 Training
Let's talk about training for a few minutes.

- How has the training you provide to founders changed with the transition to virtual programs? What was your approach? Why did you decide to do it in those terms?

- What has been the feedback of founders to the online learning format? What are the differences compared to on-site training? Why?

- Regarding training, what can still be improved in running virtual programs to ensure maximum learning for founders?

- Did you observe anything interesting or unexpected about firms in this new format of virtual training?

3.2 Cohorts

Let's talk about cohorts for a few minutes.

- During the program you are closely involved with cohorts. What difference do you feel in terms of your involvement in a POST-COVID program?

- Before COVID, how did founders interact with their cohort? What about now?

- What are the significant benefits of virtual cohorts? Can you give me an example?
- Can you also point some downsides? Can you explain it?

- Before COVID, why did you decide to have an X #startups in a cohort? Has that changed with virtual programs?

- So far, did you observe anything interesting or unexpected about startups when they are part of a virtual cohort?

SECTION 4 – OVERALL QUESTIONS ABOUT THE PERCEIVED BENEFITS/DISAVANDATGES OF VIRTUAL ACCELERATORS (5 minutes)

- Overall, do you feel founders benefit the same from by participating in a virtual accelerator? Are they learning more, less or in different ways? Can you explain it?

- What might prevent founders from having beneficial virtual programs? Can you give an example?

- Can you tell me other advantages of virtual accelerators for the founders and the accelerator employees?
- What about the disadvantages?

- In general, would you say you are happy with the program that is running currently? Compared to programs before COVID, what are the main differences in terms of outcomes (investing, etc.)?

- Is there anything else that you would like to tell me?

APPENDIX B: FOUNDERS | Interview Guide

SECTION ONE - CONTEXTUALIZATION OF INTERVIEWEE (5 Minutes)

I'd like to start by asking you a few questions about the background of your company and you. Please answer briefly as this section should take 5 minutes. Please state your name, the name of your business.

- What is/was your title/role?
- Gender
- Age
- Highest educational level/area
- Functional expertise
- Can you briefly tell why did you joined this specific accelerator?
- How was the program different from your expectations?

SECTION TWO— UNDERSTAND IMPACT OF VIRTUALIZATION ON THREE CORE LEARNING MECHANISMS OF ACCELERATORS (30 Minutes)

2.1 Training

Let's talk about training for a few minutes.

- Can you describe the program from application to Demo Day, elaborating on what happens for each part of the virtual program? (each month or phase)

- Can you tell me more about your interactions with accelerators directors during the whole program? How and when are you involved?

- What kind of support did you receive? How did it help you grow? And in what sense?

- How did you received the training provided by the accelerator? What did you enjoy the most from the virtual learning format? And the least?

- About how many seminars did you attend? From which seminars did you learn the most? What did you learn? Which did you learn the least? Why?

- Did you observe anything interesting or unexpected about the relationships developed between founders and directors?

2.2 Cohorts

Let's talk about cohorts.

- Can you tell me about how you interacted with your cohort? In what ways did you develop relationships? How easy it was to build these friendships?

- How important it was to engage with other entrepreneurs, even virtually?

- Do you think being part of this virtual cohort affected your firm's development? How?

- What did you learn from other firms? Can you give one example?

- Did you observe anything interesting or unexpected about firms while being part of a virtual cohort?

- Overall, what were for you the major benefits of joining a virtual cohort? Can you also point some downsides?

- Anything else you think is important to know about being a part of a virtual cohorts?

SECTION THREE – Overall Questions (5 minutes)

- Overall, what did you learn by participating in a virtual accelerator? Do you think it would be different in a normal accelerator?

- Would you have grown in the same way without the accelerator? If so, why?
- Was it different for other Startups or was it the same for the rest of the cohort? If so, why?
- Generally speaking, can you tell me more about the advantages of virtual accelerators? What about the disadvantages?
- Is there anything else that you would like to tell me?