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### **International Opportunities through Accelerator Networks: A Study of Startups Becoming Embedded in Edtech Context Kairikko, A.**

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INTERNATIONAL OPPORTUNITIES THROUGH  
ACCELERATOR NETWORKS: A STUDY OF STARTUPS  
BECOMING EMBEDDED IN EDTECH CONTEXT

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requirements of the University of Westminster for the  
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## Abstract

This thesis examines edtech startups in the Finnish context. It focusses on the role of accelerator networks as embedding mechanisms for internationalising startups. The topic is pertinent because the role of accelerators in the internationalisation of startups has been understudied, despite growing interest in them. The characteristics of startups are decisive for this study, as startup ventures differ from other small and new ventures and continue to adjust and iterate to develop a scalable business model while internationalising.

This study is positioned at the intersection of entrepreneurship, international entrepreneurship, and innovation. Conceptually, this study draws on the concepts of network embeddedness and on international opportunities defined as non-linear, iterative, and interactive development. This research was conducted as a single case study within the emerging edtech sector in the Finnish context and it adopts abductive approach. The extensive data consists of 46 interviews, observations, and documents, and the analysis is based on the method of constant comparison.

The research identifies accelerator networks, which are relevant for international opportunity development, and thus, it enriches the literature on accelerators. The analysis demonstrates the mechanisms of international opportunity development through networks, resources, and collaboration. A typology is applied to classify internationalising startups in terms of accelerator networks, international opportunities, and product development. Finally, all findings are synthesised in a conceptual model.

This study contributes to the emerging academic literature on accelerators by explaining the role of accelerator networks during the parallel process of venture creation and international opportunity development. Propositions are developed to advance future accelerator studies. Researching the community of internationally mixed startups in various locations and embedded in various environments challenges to reconsider the geographical location as an operationalisation of spatial dimension. Thus, this research joins the discussion on contextual dimensions in entrepreneurship studies.

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## Declaration

I declare that all the material in this thesis is my own work.

**16-12-2020**

Anette Kairikko

# 1. Introduction

## 1.1 Background to the study

This study focusses on edtech ventures and explains the mechanisms by which accelerator networks enable the early internationalisation of startups. Conceptually, this study draws on the concepts of network embeddedness and international opportunity. The context of the study is the edtech sector, and the research site is a newly established accelerator in Helsinki, Finland.

The choice of the context is justified with the following paradoxical setting. Many new ventures in export-dependent countries like Finland with limited size of the domestic market are keen to internationalise from inception.<sup>1</sup> The intention to internationalise applies also to education technology (edtech or edutech) startups, which form the industrial context of this study. Edtech companies create solutions to enhance learning, for example, in the areas of game-based learning, augmented/virtual reality (AR/VR), socio-emotional learning, creative development, and science, technology, engineering and mathematics (STEM). Edtech solutions benefit from verified pedagogical impact, and Finland has been in a leading position in terms of the education (PISA, 2015) and in the Global Competitive Index related to the education and innovation (Schwab, 2016).<sup>2</sup> Despite Finland's small home markets, leading to early intentions to internationalise, and its quality education, leading to image advantages in the international markets, the amount of exports in the field of edtech have been modest. The majority of edtech companies are young and small ventures (Tekes, 2015), and they form the scope of this study. This setting serves as a starting point for the critical case, which is the development of international opportunities in the Finnish edtech accelerator.

Startup internationalisation differs from the internationalisation of established ventures, since especially in new, young technology-based ventures, the areas of innovation, early

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<sup>1</sup> According to Lahtinen et al. (2016), 63% of the Finnish startups founded in 2015 aimed at international sales.

<sup>2</sup> According to the World Economic Forum Global Competitiveness Index 2015–2016, Finland ranked 1<sup>st</sup> in the dimension of primary education and health and 2<sup>nd</sup> in the dimension of higher education and training, among 140 countries. In the Program for International Student Assessment (PISA), Finland ranked 3<sup>rd</sup> in science, 2<sup>nd</sup> in reading, and 7<sup>th</sup> in mathematics, among OECD countries.

internationalisation, and international entrepreneurship are intertwined (Coviello & Tanev, 2017; Onetti, Zucchella, Jones, & McDougall-Covin, 2012). The processes of organisational emergence, product development, and internationalisation take place simultaneously in young technology ventures (Stayton & Mangematin, 2016). Such characteristics of startup entrepreneurship are decisive for this study. Startups are not a smaller version of large companies (Blank, 2013), and instead of executing business plans, they continue to adjust and iterate to develop a scalable business model. Startups are in the process of business model creation while starting to internationalise, yet the impact of business model creation has received limited attention in the internationalisation research (Tanev, 2017). Based on these observations, internationalisation paths vary not only between large and small firms but also among small firms, depending on the age of the venture. This study focusses on the startups that are new and intend to internationalise shortly after the inception.

Accelerators are a contemporary, growing phenomenon linked with entrepreneurial ecosystems, and they aim to support startups to scale their businesses. Accelerators are cohort-based programmes of limited duration (Pauwels, Clarysse, Wright, & Van Hove, 2016). They are also considered intermediaries in entrepreneurial ecosystems (Autio, Nambisan, Thomas, & Wright, 2018; Spiegel, 2017). Despite the growing number of accelerators globally (Global Accelerator Report, 2016),<sup>3</sup> the number of academic studies remains notably limited in terms of research combining the early internationalisation of startups and accelerators. In line with the global trends, there is in Finland an increasing number of accelerators and other types of venture growth supporting systems.<sup>4</sup> Due to variation in definitions, however, estimate the exact number of accelerators is challenging (Drori & Wright, 2018).

Prior research on accelerators and incubators and internationalisation (Engelman, Carneiro zen, & Fracasso, 2015; Kabbara, 2016) has shown the acceleration process to have a positive impact on internationalisation. Still, in-depth studies explaining the role of accelerators in the internationalisation process appear to be rare. This study aims to

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<sup>3</sup> The number of accelerators worldwide increased from 194 (2012) to 793 (2015): an increase of 308% (European Accelerator Summit, 2016).

<sup>4</sup> A mapping of Finnish startup-support services was provided as a part of a broader report on Finnish startup companies (Lahtinen et al., 2016). The mapping identified 116 different startup-support programmes or services, most of them established after 2010. Of the 116 programmes, 27 were categorised as startup hubs or communities, 26 as pre-incubators or entrepreneurship programmes, 26 as incubators or pre-accelerators, 17 as co-working spaces, and 20 as venture accelerators.

contribute to the theoretical discussion of network embeddedness in the parallel process of venture creation and internationalisation. This study also has practical implications for several stakeholders fostering entrepreneurial activity. Considering the strong focus on the context and the chosen theoretical perspectives, this research is carried out as a case study, the case being the development of international opportunities in the Finnish edtech accelerator.

## 1.2 The objectives and research questions of the study

The study aims to extend knowledge on the role of accelerator networks for startups in the edtech context, explaining in particular how accelerator networks can foster startup internationalisation. As discussed in the previous section, interest in accelerators has been growing, but little is known about their impact in the internationalisation of startups. In the vast internationalisation literature, startups represent an area with specific features.

Based on thorough searches in various data bases, only limited knowledge exists regarding accelerators and their role in the internationalisation of startups. Thus, this research is among the first to provide empirical insight into the development of international opportunities through accelerator networks. Therefore, through the lens of network embeddedness, the main research question addresses the role of accelerators in the early internationalisation of startups. Thus, this study approaches the research question from the point of view of accelerator networks. Its main research question is as follows:

*How do accelerator networks enable startups to develop international opportunities?*

The main research question corresponds to several sub-questions. The prior literature on accelerators (Vandeweghe & Fu, 2018) highlights that accelerators are hubs that bring stakeholders together. Considering the emphasis of this case study, this research must address the sector specificity of edtech and the related networks. Context is a major focal point in this study. Instead of stripping the context from its subject in order to generalise its findings, this study focusses on the characteristics of startups in one geographic and industrial context only (i.e., the Finnish context of edtech). Context matters in the entrepreneurship, and there are calls for renewed focus on context in the

entrepreneurship discussion (Autio, Kenney, Mustar, Siegel, & Wright, 2014; Welter, 2011). The above viewpoints are incorporated in the first sub-question:

*What are the relevant accelerator networks for internationalising edtech startups?*

Secondly, this research explains the phenomenon of early internationalisation and the role of an accelerator and its networks in it. Therefore, the second sub-question addresses accelerator networks and the process of the early internationalisation of startups, which comprise a specific type of entrepreneurial venture. The second research question focusses on displaying explanatory mechanisms in the early internationalisation among startups, whereas the main research question addresses holistically the role of accelerator networks in that process.

*How do accelerator networks explain the development of international opportunities among startups?*

Finally, prior literature on internationalisation has stressed embeddedness in both local and international networks. The final sub-question therefore focusses on the startup level and on the process of becoming embedded in relevant networks to enhance early internationalisation.

*How do accelerated startups use network embeddedness to develop international opportunities?*

### 1.3 Theoretical background

Theoretically, this study builds on the concept of international opportunity and the concept of network embeddedness. The opportunity-oriented view of internationalisation acknowledges the entrepreneurial aspects of internationalisation as opportunities at the heart of entrepreneurship (Shane & Venkataraman, 2000). Likewise, there is growing discussion on international opportunities in international entrepreneurship (e.g., Chandra, Styles, & Wilkinson, 2009; Mainela, Puhakka, & Servais, 2014), as there is discussion revolving around opportunities in the field of entrepreneurship more generally. This study assumes the development of entrepreneurial and international opportunities to be an interactive, dynamic and iterative process, in line with the characteristics of startups, which are the research

objects of this study. Startups develop iteratively and often non-linearly (Frederiksen & Brem, 2017), and only recently have there been initiatives to emphasise the specific features of startups in the study of early internationalisation (Coviello, 2015). The vast literature concerning born globals and international new ventures that started in the 1990s has not focussed on the emergent stage of internationalisation among small firms but, rather, has retrospectively analysed early and rapid internationalisation.

Drawing on literature on international opportunities (Blankenburg Holm, Johanson, & Kao, 2015; Chandra et al., 2009; Mainela et al., 2014; Oyson & Whittaker, 2015), this research defines the development of international opportunities as a process that moves from exploration to exploitation. Startups with international intentions explore international opportunities that may or may not lead to the exploitation of international opportunities operationalised as foreign market entry (Chandra et al., 2009; Oyson & Whittaker, 2015). For the sake of clarity, the text refers also to a shorter term, ‘internationalising startups’, using it in the same meaning as ‘startups that are developing international opportunities’. The use of this term may be justified by the fact that literature acknowledges international opportunities as a starting point for internationalisation (Johanson & Vahlne, 2009; Schweizer, Vahlne, & Johanson, 2010).

The embeddedness lens is used to study the phenomenon of the early internationalisation of startups in an accelerator. The concept of embeddedness is central to the understanding of networks as interpersonal relations and larger social structures (Granovetter, 1985; Uzzi, 1996). Prior research has shown the importance of embeddedness in relevant local networks for internationalising companies (Andersson, Evers, & Griot, 2013; Boehe, 2013; Keeble, Lawson, Smith, Moore, & Wilkinson, 1998; Leppäaho, Chetty, & Dimitratos, 2018). Certain studies likewise argue for the embeddedness of entrepreneurs in venture creation process (Cooper & Park, 2008; Jack & Anderson, 2002). Yet, the simultaneous process of venture creation and internationalisation and the role of embeddedness facilitated by an external mechanism such as an accelerator have received less attention.

#### 1.4 Research strategy and approach

The research strategy is a single case study within one industrial context with embedded cases; the case is the development of international opportunities in the Finnish edtech



accelerator. The edtech accelerator was founded 2015 in Helsinki, Finland as a privately funded accelerator focussing on learning solutions in the education sector. The first startups joined the programme 2016 and the cohorts consist of local and non-local startups. The rationale for employing case study research stems from the phenomena; new venture creation and internationalisation are complex phenomena for which the case study method has proven particularly suitable (Chetty, Partanen, Rasmussen, & Servais, 2014).

The approach to theorising from the case study is abductive (Dubois & Gadde, 2002; Dubois & Gadde, 2014). The abductive approach is not merely a methodological choice: it influences the whole research structure, as an abductive approach contains the idea of constant interplay between theory, methods, and empirical findings (Dubois & Gibbert, 2010; Visconti, 2010).

Figure 1 below highlights the circularity of the research process in this study and an overview of a rough timeline for it. The idea is to show how a pre-understanding of the phenomenon is based on the literature and how it evolves as the empirical understanding and the emerging case evolve. The figure displays the literature inquiries to show how the final ideas were developed and how this study was conceived through the interplay of theory and empirical fieldwork.

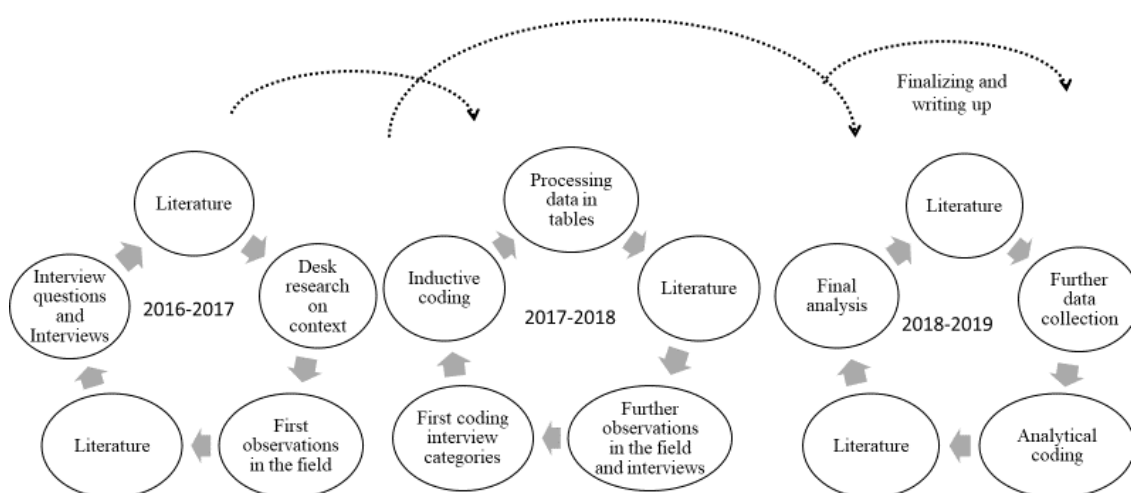


Figure 1 The research process.

The illustration above demonstrates roughly how the research proceeded. However, there were minor iterative processes even within the circles highlighted above. The research was characterised by iterative development between the literature and the empirical findings.

Within abductive studies there may be sub-phases that are more inductively or deductively oriented (Dubois & Gibbert, 2010). As the figure above highlights, there are sub-phases, during which the empirical data is approached inductively. However, as a whole, this study is not based on inductive reasoning. It follows abductive approach, which allows researcher to go to the field theoretically informed even though the final theoretical approach is clarified during the non-linear process of moving back and forth between the data and the theory.

This study aims to increase knowledge on early internationalisation of startups through accelerator networks. The research site is a Finnish education technology accelerator, which hosts both Finnish and non-Finnish startups and has global network of partners. Generally speaking, studying startups in the Finnish context is reasonable as in Finland, known as a high-tech country, discussion of high-growth startups and startups in the context of economic renewal is topical (Wallin, Still, & Henttonen, 2016).

This study was completed on startups with international aspirations whereas the majority of the existing research has been conducted with retrospective view among companies that have already internationalised. In other words, the basis of that research is the outcome of the process rather than the emerging internationalisation. The data collection took place parallel to the emergence of the Finnish edtech sector (2016–2019) and the first programme cohorts. Following a case study strategy, the data collection consists of multiple methods such as interviews, observations, and documents.

## 1.5 Contribution to knowledge

This research mainly contributes to the growing literature on accelerators by extending knowledge of how an accelerator may foster early internationalisation among startups. In-depth knowledge of the topic is provided through a typology of accelerated internationalising startups and discussion of the development of international

opportunities through accelerator networks. The findings are illustrated in a conceptual model showing the interplay of accelerated, internationalising startups, accelerator networks, and the wider context of the edtech sector. Propositions are developed to advance further studies regarding accelerators.

The study's conceptual approach joins discussions of international opportunities and networks as embedding mechanisms. By incorporating the characteristics of startups in the international opportunity discussion, this study defines international opportunities as interactive, iterative, and non-linear processes of development. The methodological choice to focus on real-time early-stage development instead of looking retrospectively at internationalised companies supports the attempt to add knowledge on the parallel process of venture creation and early internationalisation.

Furthermore, this study contributes to contextualised entrepreneurship studies by problematising the spatial dimension of the context in an internationally mixed community of digital entrepreneurs. This contribution has further implications for the study of internationalisation and network embeddedness, which is often based on the distinction between local and international networks.

In terms of implications for practitioners, this study provides new insights regarding focussed, industry-specific accelerators as contrasted with general accelerators.

Moreover, this study suggests keeping internationalisation on the agenda of the accelerators, including both the internationalisation of an accelerator and the startups it hosts. The following groups of practitioners benefit from the results: firstly, accelerator managers when designing and implementing programmes and constructing relevant partner networks and, secondly, startup entrepreneurs with intentions to the global markets when considering the choice of a suitable accelerator. Considering the special features of startups, this study also provides useful insights for people and organisations involved in the early stages of venture growth.

## 1.6 The structure of the thesis

Chapter 2 provides the theoretical background and positioning for the study. It reviews the existing body of knowledge in terms of accelerators and discourse related to international opportunities and network embeddedness.

Chapter 3 synthesises key definitions, gaps in the knowledge, and potential contributions regarding the field of study. The chapter ends with an initial conceptual framework, but due to the abductive nature of the study it is further developed throughout the research process.

In Chapter 4 the study's methodological choices are discussed. The discussion starts with the philosophical basis of the study and continues with the justification for selected research strategy. Subsequently, the empirical research design is presented in detail. The chapter ends with the evaluation criteria for the methodological choices and researcher's reflections.

Chapter 5 is the analysis chapter. The analysis follows the research questions, and the findings are derived from the rich empirical material. The in-depth inquiry into the emergence of the accelerator indicates the relevant networks of the accelerator, mechanisms for international opportunity development in an accelerator, and a typology of startups in terms of parallel early-stage developments. This chapter also synthesises the findings and proposes a re-visited conceptual model.

Chapter 6 is a concluding chapter and it draws together the research. This chapter discusses the findings and compares and contrasts them with the existing literature. The chapter suggests contributions to knowledge. Propositions are suggested to advance knowledge on accelerators. This chapter also focusses on practitioner viewpoints regarding the findings. This study's limitations are then discussed, along with suggestions for further research.

## 2. Literature review and the theoretical positioning of the study

The literature review poses the question of accelerator networks and how they enable the early internationalisation of startups. This section positions this question in the current entrepreneurship discourse. This study draws knowledge from the following streams of literature: entrepreneurship, international entrepreneurship, and innovation.

Figure 2 summarises the theoretical positioning of the research and the respective streams of literature. The phenomenon is startup internationalisation, in particular the role of an accelerator, which is studied through the lens of network embeddedness. The study is built on the theoretical concepts of international opportunities and network embeddedness.



Figure 2 Key literature and theoretical positioning of the research.

Despite the cross-disciplinary nature of the study, it focusses mainly on the entrepreneurship literature. There are alternative ways to approach the early internationalisation of entrepreneurial ventures. The emphasis may be on either the entrepreneurial process or on the internationalisation process. Fletcher (2004) argues the internationalisation process has dominated the entrepreneurial process in the international entrepreneurship discourse. Still, for small businesses, the entrepreneurial process may be one in which internationalisation takes place. This research deals with

early-stage entrepreneurial ventures and acknowledges the parallel process of venture creation and internationalisation. Thus, it takes the entrepreneurial approach to the internationalisation process.

The emerging field of international entrepreneurship lies at the intersection of entrepreneurship and international business. There is growing mutual interest across the fields of research: international business research showing interest in entrepreneurial ventures and likewise entrepreneurship research attending to the internationalisation of the marketplace (Jones, Coviello, & Tang, 2011; Servantie, Cabrol, Guieu, & Boissin, 2016).

Regarding early internationalisation, many investigations have been carried out regarding international new ventures (e.g., Oviatt & McDougall, 1994; Zahra, 2005) or born globals (e.g., Gabrielsson, Kirpalani, Dimitratos, Solberg, & Zucchella, 2008; Knight & Cavusgil, 2004; Sharma & Blomstermo, 2003), which have profoundly shaped the literature on internationalisation of firms. The research on born globals and international new ventures covers extensively the types of companies that have been able to make it to the foreign markets shortly after their inception. However, the research often focusses on the retrospective viewpoint instead of the emergent stage of opportunities. In other words, ventures with international intentions deserve further research (Coviello, 2015; Rasmussen & Tanev, 2015).

Furthermore, considering those characteristics of the digital businesses which enable companies to spread their innovations rapidly, this research also acknowledges recent notions that internationalisation and international entrepreneurship are intertwined (Onetti et al., 2012; Rasmussen & Tanev, 2015; Stayton & Mangematin, 2016). The processes of organisational emergence, product development, and internationalisation take place simultaneously in young technology ventures (Stayton & Mangematin, 2016).

Considering the need to increase knowledge of early-stage ventures with intentions to internationalise, accelerators are interesting actors by which to study this phenomenon. Accelerators are a growing phenomenon in entrepreneurial ecosystems. Nevertheless, the number of academic studies remains highly limited, and there is hardly any research combining the internationalisation viewpoint with accelerators. A review of publications regarding accelerators and incubators (Mian, Lamine, & Fayolle, 2016)

demonstrates that accelerator studies lean towards the scholarly fields of innovation and entrepreneurship. Therefore, this study aims to look at both streams of literature.

As discussed above, this research deals with early-stage entrepreneurial ventures and takes an entrepreneurial focus in examining the internationalisation process. The opportunity viewpoint is justified, as the definition of international entrepreneurship by Oviatt and McDougall (2005, p. 540) clearly manifests the centrality of the opportunities:

the discovery, enactment, and exploitation of opportunities – across national borders – to create future goods and services.

Furthermore, the centrality of opportunities in international entrepreneurship has been expressed by several researches (Coviello, McDougall, & Oviatt, 2011; Mainela et al., 2014). The focus shift aligns with the earlier paradigm shift in the entrepreneurship field, which started with a seminal paper by Venkataram (1997), arguing that opportunities are at the core of entrepreneurial behavior.

To summarise the positioning of the research, this study aims to increase knowledge of accelerator networks for internationalising startups. Thus, this study is positioned at the intersection of several streams of the literature: accelerators and similar mechanisms (innovation and entrepreneurship), international opportunities (international entrepreneurship), and network embeddedness in internationalisation and venture creation (international entrepreneurship and entrepreneurship).

Respectively, the literature review builds on the following major entities: review of the knowledge of accelerators (2.1), international opportunities (2.2.), and network embeddedness (2.3). After this review, Chapter 3 is devoted to the synthesis of the theoretical background and presents an initial conceptual framework. In line with abductive theorising, the conceptual model was under constant iterative development throughout the research process. Accelerators are central to this research, and the literature review starts with a discussion of these novel mechanisms for supporting new ventures.

## 2.1 Accelerator networks and startups

Accelerators comprise a relatively new mechanism to enhance the development of startups. The growth of accelerators has been rapid. The first accelerators date to 2005, and they were established in the US, but today a wide range of accelerators exist throughout the world (Global Accelerator Report, 2016).

Accelerators have attracted growing research interest due to their role in fostering innovation and economic growth. Due to the newness of the phenomenon, many of the studies and reports on accelerators focus on defining them and distinguishing accelerators from closely related mechanisms that support newly established ventures (Cohen & Hochberg, 2014; Hathaway, 2016; Isabelle, 2013; Kabbara, 2016; Pauwels et al., 2016; Surlemont, Nlemvo, & Pirnay, 2002). However, it appears that the process of acceleration would require further studies (Wenzel & Koch, 2018). In fact, this study focusses on one aspect of the acceleration process, it investigates the exploration and exploitation of opportunities outside the home market of startups.

The following sections review the existing body of knowledge in terms of accelerators by addressing, in particular, the research question related to the accelerator networks. Based on the review, there is still much room to investigate the accelerator phenomenon, and there appears to be lack of studies in various national contexts. The remainder of this section proceeds as follows. The discussion starts with various definitions of accelerators and comparisons of similar support mechanisms. These definitions are further discussed both from the point of view of accelerator programmes and as related to accelerators within wider entrepreneurial ecosystems. Thereafter, the review deals with building blocks and types of accelerators, followed by the specific features of startups and the internationalisation of startups in accelerators. Finally, emphasis is placed upon prior knowledge of accelerator networks.

### 2.1.1 Definition of accelerators

This section considers definitions of accelerators and the positioning of accelerators within the vast arena of startup-support mechanisms. The review also discusses key constructs of accelerators. One type of definition of accelerators is given through the



programme offered for the selected cohorts; such is Cohen and Hochberg's (2014, p. 4) definition:

A fixed-term, cohort-based program, including mentorship and educational components that culminates in a public pitch event or demo-day.

Alternatively, a definition may hinge on the role of accelerators as ecosystem creators or intermediaries. This perspective challenges the narrow view, which defines accelerators mainly through the programme cohorts. Drori and Wright (2018, p. 1) take the ecosystem perspective, defining accelerators as follows:

An accelerator is a generic organisational form that aims to stimulate entrepreneurship. It is structured to provide an intensive, limited-period educational program, including mentoring and networking for the cohort of startup participants selected for each program, to improve their ability to attract investment following the demo day at the end of program. Accelerators are organizations that serve as gatekeepers and validators of promising business innovations through their embeddedness in their respective ecosystems and thus, take an active and salient role in socio-economic and technological advancement.

The latter definition relates to the network embeddedness and serves better the needs of this research. However, the characteristics of cohorts and programmes are a concrete embodiment of accelerators, and thus, they are significant for this study as well. Consequently, they deserve attention in this inquiry.

Due to the novelty of accelerators, limited research has been conducted on accelerators (Cohen, 2013; Pauwels et al., 2016). The studies on the evolution of the business incubation (Bruneel, Ratinho, Clarysse, & Groen, 2012; Mian et al., 2016) demonstrate that the accelerators have roots in the incubator phenomenon, which has been extensively studied since the 1980s (Hackett & Dilts, 2004). Existing knowledge on incubators seems to cover extensively the factors of incubator success (Harper-Anderson & Lewis, 2018).

Despite the similarities and overlapping use of terminology, incubators are not the same as accelerators. Incubators are characterised by physical space and unlimited duration, whereas accelerators are cohort-based with limited duration and are clearly connected with growth in the digital economy (Cohen & Hochberg, 2014; Hathaway, 2016; Isabelle, 2013; Miller & Bound, 2011; Pauwels et al., 2016; Surlemont et al., 2002).

The wide spectrum of support mechanisms for startups includes angel networks, business competitions, co-working spaces, hackathons, startup weekends, entrepreneurship courses, mentoring schemes, social venture academies, and seed funds (Miller & Bound, 2011). Different mechanisms create further confusion regarding the use of terminology. The terminology is ambiguous, and the word ‘accelerator’ is applied to a number of related concepts (Cohen & Hochberg, 2014).

Incubators have been widely studied, in comparison with accelerators. Incubators are initiated by policy makers, private investors, universities, corporations, and research institutes. Studies on incubators focus on, for example, characteristics, types and evolution of the phenomenon. The investigations related to incubators look at the phenomenon through various theoretical lenses within several disciplines (Mian et al., 2016).

Regarding the evolution, Mian et al. (2016) distinguish three waves of incubator development. The early versions mostly provided affordable space and shared services, but in the second wave, the services were more versatile and advanced, and the third wave seems to bring specialisation. Similarly, Bruneel et al. (2012) have argued there are three generations of business incubators. Thus, the phenomenon of accelerators is rooted in the incubators.

Several studies and reports (Cohen & Hochberg, 2014; EC, 2002; Hathaway, 2016; Isabelle, 2013; Kabbara, 2016; Miller & Bound, 2011; Pauwels et al., 2016; Surlemont et al., 2002) were reviewed in order to identify the key characteristics of the accelerators and incubators. Table 1 presents a comparative summary based on the review. Despite the overlapping use of the terminology, numerous clear differences exist between these mechanisms to stimulate entrepreneurship. However, despite the differences, accelerators also offer support, similar to different types of incubation, such as counselling, mentoring, and networking services.

Table 1 A Comparative Summary of Key Features Regarding Incubators and Accelerators

<b>Comparative feature</b>	<b>Incubators</b>	<b>Accelerators</b>
Duration	Long-term	Short-term
Cohorts	No, sustainable	Yes, cohort-based, peer support
Purpose	Economic development	Growth and ROI
Business model	Non-profit, rent	Investment, profit, non-profit
Selection	Non-competitive	Competitive, cyclical, selective
Venture stage	Early or late	High-growth
Selection criteria	Individual/team	Focus on teams
Venture location	On-site	Usually on-site
Type of sectors	Sectors with longer time to market	Sectors with shorter time to market
Education offered	Ad hoc	Seminars
Mentorship	Minimal, tactical	Intense
The stage in the evolutionary process	Since 1980s, several waves and generations of incubators, the accelerator also	Fairly new phenomenon, since 2005

The above emphasises the characteristics of accelerator programmes and the differences between accelerators and incubators. There are also approaches (Autio et al., 2018; Goswami, Mitchell, & Bhagavatula, 2018; Hathaway, 2016; Spigel, 2017) that stress the match-making position of the accelerators in the interaction between startups and the stakeholders.

The ecosystem approach stresses that accelerators are not only beneficial for the startup ventures but also for the wider community (Hathaway, 2016). How do ecosystems and networks then link with each other? Anggraeni, Den Hartigh, and Zegveld (2007) suggest that business ecosystems are a perspective by which to understand business networks. Instead of a focus on interorganisational relationships from the network perspective, the focus is holistically on the mechanisms that shape the system, including actors and their roles.

Entrepreneurial ecosystems are combinations of social, political, economic, and cultural elements within a region supporting and encouraging the growth and development of startups (Isenberg, 2011; Spigel, 2017). They differ from clusters in that they include entrepreneurial opportunity discovery and pursuit (Autio et al., 2018). This difference is significant for the scope of this study. Ecosystems are receiving growing attention. They highlight changes in entrepreneurship practices and developments in the digital era. Accelerators are elements of the entrepreneurial ecosystems that enable business

model experimentation and horizontal knowledge spillovers (Autio et al., 2018). Thus, the impact of accelerators is not limited to accelerated startups.

Goswami et al. (2018) position accelerators in terms of entrepreneurial ecosystems by defining accelerators as intermediaries between startups and local ecosystems.

According to that positioning, accelerators connect, develop, coordinate, and select.

Thus, they are a bridge between startups and the larger entrepreneurial environment.

Likewise, according to Spigel (2017), accelerators are positioned outside the boundaries of the company but within the regional system, and accelerators belong to the material attributes of ecosystems. Similarly, Hathaway (2016) stresses the positive impact on the regional entrepreneurial ecosystem and the benefits of accelerators to non-accelerated startups as well. Therefore, the ecosystem viewpoint does not build on the distinction between the benefits of the accelerated versus non-accelerated ventures, but rather on the benefits for the whole entrepreneurial ecosystem. This notion influences the design of this study. The focus of this research is accelerated startups in an emerging sector of edtech, not a comparison between accelerated and non-accelerated startups.

Given the above, accelerators are actors with the role of facilitator, intermediary, or creator in an entrepreneurial ecosystem. Regarding the focus of this research, international opportunities and startups, it seems that the role of accelerators may be approached from three perspectives: programme facilitator, intermediary in the ecosystem, or ecosystem creator. Depending on the selected focus, presumably the role of the accelerator manifests differently in the early internationalisation of startups.

Accelerators are a support mechanism to stimulate the emergence of a viable business model for startups, and they perceive themselves as ‘actors of change’, which means not only identifying opportunities but also facilitating their distribution (Drori & Wright, 2018). However, it is worth noting that accelerators are sometimes startups themselves (Bliemel et al., 2016; Goswami et al., 2018; Pauwels et al., 2016). Pauwels et al. (2016) have used the design lens and provided key building blocks and related constructs. The previous discussion has demonstrated the existing variety among accelerators. Table 2, which is adapted from Pauwels et al. (2016, p. 17) demonstrates an approach to classify accelerators according to building blocks and constructs.

Table 2 Building Blocks and Main Constructs for Accelerators (adapted from Pauwels et al., 2016, p. 17)

Building block	Constructs
Programme package	mentoring services, curriculum/training program, counselling services, demo days/investor days, location services, investment opportunities
Strategic focus	industry/sector focus, geographical focus
Selection process	online open call, using externals for screening, team as primary selection criterion
Funding structure	investor funding, corporate funding, public funding, alternative revenues
Alumni relations	alumni network, post programme support

Regarding strategic focus, the tendency is towards a higher level of sector specificity (Drori & Wright, 2018; Isabelle, 2013; Mian et al., 2016). The share of general accelerators is already less than half that of all accelerators (Global Accelerator Report, 2016), resulting in more focussed services in the programme package: for example, mentors, corporate ties, and teams. The quality of mentors is a critical issue for accelerators, as mentors are central to accelerators (European Accelerator Summit, 2016). This research centres on accelerators with a clear strategic focus, since this study focusses on edtech ventures in an edtech accelerator. Calls have recently been raised to examine whether incubators and accelerators should be sector specific or generalized (De Massis, Kotlar, Wright, & Kellermanns, 2018).

As to the funding structure, approximately two-thirds of accelerators are for-profit, and they are mostly funded by private capital from investors (Global Accelerator Report, 2016). Financial sustainability may challenge accelerators (European Accelerator Summit, 2016).

The selection of quality startups forms another challenge for the accelerators (European Accelerator Summit, 2016). The more well-known the accelerator, the tighter the selection process, which leads to higher-quality startups and more success, in turn attracting quality startups. The maturity of the local entrepreneurial ecosystem manifests in the selection process. Some regions do not have a pool of quality startups. In addition, the global competition among accelerators enables startups to apply for accelerators with good reputations.

After the accelerator period, startups join the alumni community, and the more powerful the networks of investors and mentors, the more post programme support is available. Particularly, the top programmes highlight the value of alumni networks (Hochberg & Fehder, 2015). Concerning the topic and research questions of this study, post-accelerator time and networks are crucial.

Figure 3 synthesises the viewpoints discussed earlier, that is, the building blocks (Pauwels et al., 2016) and the elements of the widely used definition of accelerators (Cohen & Hochberg, 2014). However, it also considers ecosystem viewpoints (Drori & Wright, 2018; Goswami et al., 2018), acknowledging the role of accelerators as bridge builders. It furthermore refers to Spigel (2017) and his notion of accelerators as organisations outside the boundaries of startups, but within the regional system. Note that it does not explicitly mention the different levels of ecosystem attributes and their interrelationships, however.

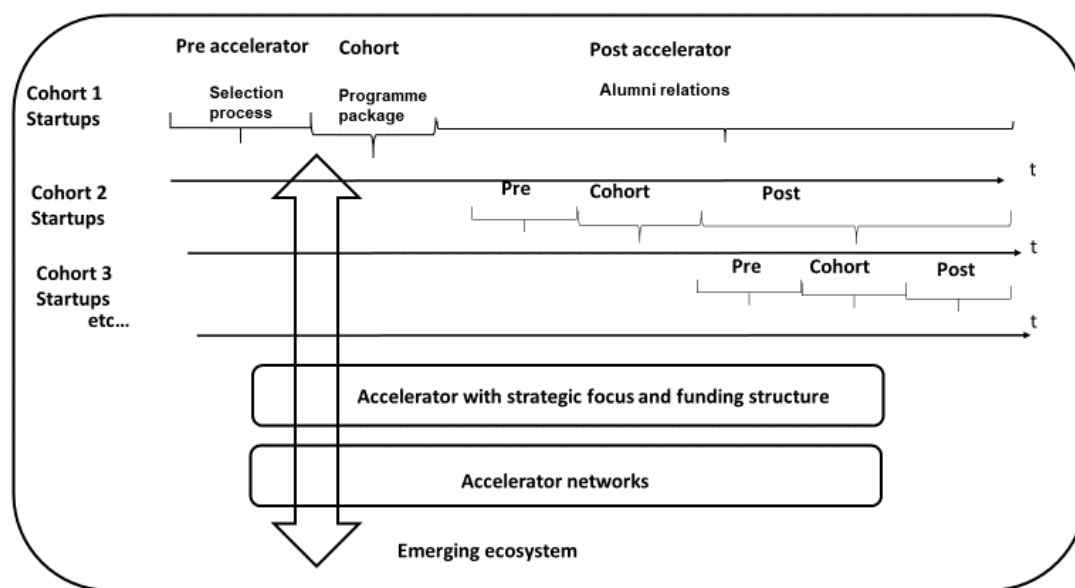


Figure 3 Overview of the accelerator programme cohorts, alumni and partner networks.

The figure illustrates the programme level, that is, cohorts, which after graduation become members of alumni community. Additionally, it positions accelerators in an intermediary role in wider networks. The programmes contain phases before, during, and after the accelerator programme. With each new program, the alumni community grows, provided that the accelerator is able to keep the alumni as active members. The

role of an accelerator is the role of a bridge builder between startups – both in the cohorts and in the alumni community – as well as between startups and partner networks. Among the definitions discussed earlier, neither the programme viewpoint nor the ecosystem viewpoint highlights internationalisation. This study, however, centres on international elements both in terms of programme and intermediary role of an accelerator.

As to the prior studies on accelerators and incubators, they separate accelerators from incubators, and discuss the role and characteristic features. In-depth studies regarding the role of an accelerator in combination with international opportunities appear to be rare. The objective of accelerators is to scale the businesses of startups, which refers often in the small home markets to early internationalisation. Considering the points above, it seems that room is left to extend knowledge of the internationalisation of startups in accelerators.

Notably, however, accelerators also recognise and exploit international opportunities. These developments link with the international intentions among startups, which they are hosting. Firstly, the accelerator level refers to the internationalisation of the programme through the attending non-local startups. It seems that, at least in Europe, participating startups in most of the accelerators form international cohorts; less than 20% of accelerators reported they would not have any foreign participants (European Accelerator Summit, 2016). Hence, accelerators are international. This internationally mixed composition of startups challenges the definition of home versus host markets. Within a cohort a number of home markets coexist.

Secondly, accelerators may establish parallel foreign accelerator programmes or subsidiaries. Prior research on the internationalisation of an incubator (Baraldi & Ingemansson Havenvid, 2016) shows that internationalisation takes place at multiple levels: finding financial resources internationally, conducting foreign sales, and setting up subsidiaries and co-incubation with international actors in the field.

This section has discussed the definition of accelerators. The following section focusses on startups in the accelerator context. The unit of analysis in this study is an edtech startup in an accelerator, and therefore, a discussion of the characteristic features of startups in an accelerator is relevant.

### 2.1.2 Internationalising startups and accelerators

As discussed above, accelerators select startups for the acceleration programme through a competitive process. The characteristics of startup entrepreneurship are decisive for this study. Startups are not smaller versions of large companies (Blank, 2013), and they are still adjusting and iterating to develop scalable business models. Startups are in the process of business model creation while starting to internationalise, yet, the impact of business model creation has received less attention in the internationalisation research (Tanev, 2017). Coviello et al. (2011) point out that the decisive factor from the international entrepreneurship's point of view is the age of the venture as the young and new ventures differ from the internationalising small and medium-sized enterprises possessing longer organisational experience. Coviello and Tanev (2017) nevertheless argue that not all the studies labelled as studies of international new ventures have been dealing with young ventures.

One of the definitions of startups is 'young (newly emerged) entrepreneurial ventures with ambitious growth plans and scalable business models built around innovative product(s), service(s) or platform (s)' (Business Finland, 2018, p.17). There are three key elements in this definition: *age*, *growth orientation*, and *innovativeness*. Each is detailed below.

Different age ranges have been proposed as the cut-off point for 'a new venture'. Startups are nascent ventures, but scholars diverge on the definition of 'young venture'. It seems that ventures of six years and younger are commonly considered 'young' by academics (Brush & Vanderwerf, 1992; Zahra et al., 2000) and by organisations related to the entrepreneurial growth (Business Finland, 2018). Yet, some researchers (McDougall, 1989; Zahra, 1996) have supposed the age to be, for example, eight years or younger, and five years is the cut-off commonly used by public sector organisations enhancing entrepreneurship (Lahtinen et al., 2016). According to Zahra et al. (2000), firms that are six years of age or younger are new ventures. This research draws on that definition and studies startups that are less than six years old.

The concept of 'inception' itself is also challenging. When defining the age of the venture, it is not a straightforward decision whether to define time of inception as date



of legal incorporation. Hewardine and Welch (2013) propose inception to be a process that occurs over time and contains a number of activities in the gestation period. A well-known definition for the existence of an emerging organisation specifies the following criteria: demonstrating intention, establishing boundaries, acquiring resources, and engaging in exchanges (Katz & Gartner, 1988).

Regarding growth orientation, startups are growth-oriented ventures, and in order to scale their businesses, they must seek international opportunities from day one to have a sufficient customer base, particularly the companies originating from small home markets (Etemad, Wright, & Dana, 2001; Tanev, 2017). McDougall and Oviatt (2000) positioned international entrepreneurship within the academic streams of studies on organisations by showing the relations of research fields in terms of the following dimensions: geographical scope (domestic vs. international) and type of organisation (entrepreneurial vs. large, established). The combination of international and entrepreneurial suggests global startups or startups with international intentions, which are the focus of this study.

To further narrow the scope of startups in terms of international or global activities, there is a widely cited classification by Oviatt and McDougall (1994, p.59), highlighted in the figure below as a slightly modified version. The typology classifies startups in terms of their international or global activities, and the classification is not limited to sales or exports but considers all value chain activities. Therefore, internationalisation is not limited to outward activities but acknowledges also inward activities. Importantly, this model makes a distinction between global and more regional or international startups. Oviatt and McDougall (1994) distinguished types of international new ventures by positioning them based on both the number of countries involved (few vs. many) and extent of activity across countries (few vs. many).

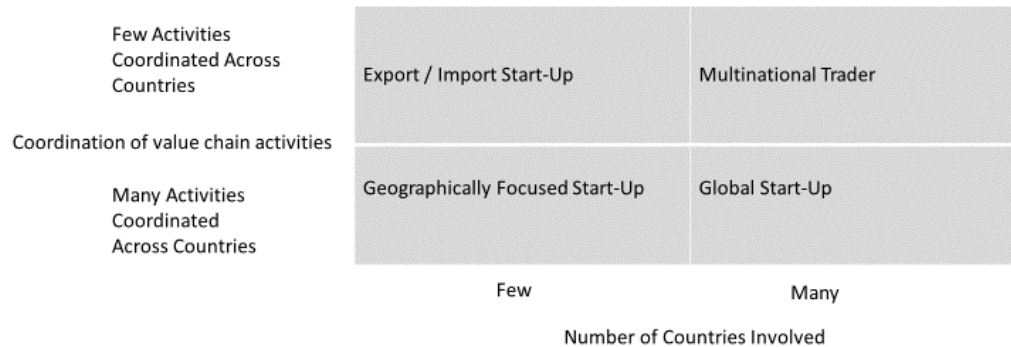


Figure 4 Different types of international new ventures (Oviatt and McDougall 1994, p.59).

The third element in the definition of startups is innovativeness. The process of creating innovative products and business models has received increasing attention. It has led to the emergence of popular step-by-step processes and practitioner tools to create value for the customer through iterative product and business model development instead of through rigid planning (Blank, 2003; Osterwalder & Pigneur, 2010; Ries, 2011). These methods have been compared and contrasted with entrepreneurship theories (Frederiksen & Brem, 2017; Ghezzi, 2019). Clear similarities arise between these methods and effectuation logic (Saravathy, 2001) which has proven appropriate in situations where markets need to be created and where there is no pre-existing data to support the decision-making.

Product development in emerging ventures with limited resources requires the development of inter-organisational relationships (Marion, Eddleston, Friar, & Deeds, 2015). In this context, the product offering of companies is increasingly fully or partially digital, a trend which applies to entrepreneurs of this study as well, since accelerators often host digital ventures with scalable business models. For internationalisation paths, digital offerings enable companies to serve global customers from one location and with fewer personnel in the various national markets (Coviello & Tanev, 2017). The evidence is, however, contradictory regarding the extent to which

physical distance still matters in the digitalised world (Zahra, Wright, & Abdelgawad, 2014).

Accelerators seem to have several benefits for startup ventures. Hallen, Bingham and Cohen (2014) argue that accelerators accelerate due to a combination of education and network development. According to Miller and Bound (2011), the benefits include investment by an accelerator, connections to further investments, support in developing the business and products, a given framework for progress, the network of peers, and the external validation, which follows automatically acceptance to a program. A Finnish report (Lahtinen et al., 2016) argues that accelerators have a favourable impact on the resources and capabilities of the startup ventures. It appears there are broad categories related to knowledge, resources, and networks.

Accelerators are a new phenomenon, and they need to prove their credibility also at the industry level (European Accelerator Summit, 2016). The impact of accelerators on measurable performance may vary widely, and some accelerators may even slow down the development (Hathaway, 2016). The counterproductive effect may result from factors such as overwhelming time compression and standardised approaches regarding networks and knowledge (Hallen et al., 2014). One of the features in accelerators is the fixed and relatively limited duration of acceleration, which may cause difficulties in absorbing knowledge. Regarding the standardised offering, the ‘one-size-fits-all’ approach may be problematic. Specialised accelerators are probably in a better position than are general accelerators to provide meaningful networks and knowledge for startups. The trend is in the direction of sector-specific accelerators (Isabelle, 2013; Mian et al., 2016), and more research is needed regarding the sector-related benefits of these organisations. Due to the wide variety of differences among accelerators, the question of whether accelerators actually accelerate is complex (Hallen et al., 2014; Hathaway, 2016).

Wenzel and Koch (2018), in turn, provide a nuanced approach to the outcome of acceleration by distinguishing between the following types of outcomes: advancing product-market concepts and improving communication packages (forwarding) or providing access to technologies, customers, and convincing communication (leaping). The distinction above may bear certain similarities to the impact of acceleration on internationalisation and entrance to new markets. This study seeks answers to the question of becoming part of the industry-level ecosystem and how it may forward or

leap the international intentions of the ventures. Startup founders seem to apply to accelerators in order to expand resources, knowledge, and networks. On the other hand, the teams in the new ventures must analyse what is the most beneficial support for them (Isabelle, 2013). Still, the evidence related to impact on performance is contradictory both in terms of accelerators (Hathaway, 2016) and in terms of incubators (Isabelle, 2013; Phan, Siegel, & Wright, 2005).

From the ecosystem perspective, the benefits are not limited to the startups attending the programmes but cover a larger startup community. The ecosystem perspective connects also with the role of startups in industrial renewal, as the entrepreneurial innovations of startups play a substantial role in industry renewal (Autio et al., 2014; Sipola, Puhakka, & Mainela, 2016). From a single startup's perspective, however, the expectations may link with the programme and the expected benefits of networks, resources, and knowledge that they can acquire through the programme and which potentially contribute to their performance.

Despite the growing interest in accelerators, academic research on accelerators has been limited (Cohen, 2013; Fowle, 2017). Regarding internationalisation and startups in accelerators, there is remarkably little research (e.g., Engelman et al., 2015; Kabbara, 2016) of both incubators and accelerators. Engelman et al. (2015) have identified factors related to the internationalisation in an incubator environment and concluded a positive impact on the internationalisation. Kabbara (2016), in turn, has studied entrepreneur-related and accelerator-related factors in the internationalisation of web-based startups and their findings support the crucial role of an accelerator in contributing to the success of the startups at faster speed. The study raises the issue of joining an accelerator programme both locally and internationally. The liability of newness hinders new ventures in their early development, but the incubators and accelerators provide support, recognition in the market, and growth with peers to overcome that liability (Kabbara, 2016).

The existing studies regarding accelerators and internationalisation show the positive impact, but they exhibit certain limitations. The samples are too small to provide generalisable data, nor do they provide in-depth data, through, which would holistically explain the role of an accelerator in the internationalisation process. The internationalisation of the accelerator itself is not considered. In addition, the data is collected at one point in time, even though the internationalisation and venture

formation are processes (Jones & Coviello, 2005; Welch & Paavilainen-Mäntymäki, 2014).

The literature on internationalisation argues that new ventures have liability of being outsiders in the relevant networks (Johanson & Vahlne, 2009), which hinders the early internationalisation. One of the key benefits of accelerators is that they facilitate networks, and since this study attempts to expand knowledge of accelerators and internationalising startups, it is relevant to view accelerator networks next.

### 2.1.3 Accelerator networks

The accelerators operate as hubs, which coordinate resources including networks. Considerable amount of research (e.g., Coviello & Munro, 1997; Coviello & Cox, 2006; Etemad et al., 2001; Oviatt & McDougall, 1994) has demonstrated the crucial role of networks in early internationalisation. In order to build up networks and access required knowledge and resources for growth, many startups look for support from accelerators. Several studies (Bøllingtoft & Ulhøi, 2005; Hansen, Chesbrough, Nohria, & Sull, 2000; Pettersen, Aarstad, Høvig, & Tobiassen, 2015; Soetanto & Jack, 2011; Tötterman & Sten, 2005; Vanderstraeten & Matthyssens, 2012) have enriched the understanding of incubators from the social networking perspective. However, prior research seems to provide limited knowledge of how accelerators facilitate social networks or enable startups to enhance their early internationalisation with the help of networks.

Regarding the concept of local embeddedness - defined as intra-industry linkages, which foster internationalisation both formally and informally - there is research evidence (Keeble et al., 1998) showing the benefits of it. Since accelerators deal with young ventures, the setting is different from the established ventures with established industry connections. The entrepreneurial opportunity viewpoint is central to young ventures, which accelerators host. Therefore, an accelerator study may provide new knowledge to the discussion on network embeddedness and internationalisation.

Startups are exposed to other startups, accelerators, and key stakeholders. Vandeweghe and Fu (2018) suggest following six key stakeholder groups of accelerators. Three of the stakeholder groups are external (outside the boundaries of focal organisation): partners, investors, and portfolio companies. Three of them are internal (located within the boundaries of focal organisation): sponsors, directors, and staff. The sponsors fund

accelerators and could be corporations, private investors, or venture capitalists and public and semi-public organisations. These six groups are typically present in all accelerators. The line between external and internal depends on the accelerator setting.

Due to the similarities between accelerators and incubators and because of the lack of existing research on accelerators, a review of incubator studies in terms of networks is included in this research as well. Since accelerators have roots in incubator phenomenon knowledge of incubator networks provides a basis on which to approach accelerator networks.

The concept of the ‘networked incubator’ (Busch & Barkema, 2020; Hansen et al., 2000; Roseira, Ramos, Maia, & Henneberg, 2014) differentiates traditional incubators and networked incubators, the latter having substantial advantages through potential for partnerships, recruitments, and expert advice for startups. Further network-oriented incubator studies demonstrate a multitude of important aspects such as focus on social capital (Tötterman & Sten, 2005), mechanisms between different levels of actors (Bøllingtoft & Ulhøi, 2005), interplay between networks and entrepreneurial actors (Pellinen, 2014), comparison of the usefulness of networks (Pettersen et al., 2015), and tangible versus intangible advantages (Mian et al., 2016).

The birth of accelerators is considered to have occurred a few years after the concept ‘networked incubator’ was widely recognized. Accelerators have much in common with the concept of networked incubators as programmes and as ecosystem builders. The studies also clearly highlight the multiple levels of interaction between different actors and indicate the important role of peers. These insights provide useful perspectives by which to approach the network embeddedness in an accelerator setting.

As discussed earlier, depending on strategic focus, there are following main groups of accelerators: general and sector-specific or focussed accelerators (Pauwels et al., 2016). Previous research has not determined whether sector-specific or general accelerators are superior. Some studies (Mian et al., 2016) have argued particularly for the increase in specialised programmes and research (Soetanto & Jack, 2011) showing the need for more customised and nuanced networks. Vanderstrateten and Mathysses (2012), contrary to others, have argued that the effectiveness is not necessarily at a higher level in a specialist type of incubator. Referring to entrepreneurship in general, sector specificity remains under-theorised (De Massis et al., 2018), questions remain

unanswered: How does it shape the entrepreneurial phenomena such as opportunity development, and what are the underlying mechanisms? Sector or industry specificity is a key factor in this research. Instead of a comparison – sector specific versus generalist – this study examines the accelerator at all levels of interaction: startups among themselves, startups and accelerator, accelerator and sector-specific networks, and startups and sector-specific networks.

Since incubators have similarities with the accelerators and because the concepts sometimes even overlap, as discussed in detail in 2.1.1, the findings from incubator studies that have utilised the network approach provide insights to study the accelerators and networks. The findings reveal network benefits such as the acquisition of resources such as advisors, board members, labour and financing (Cooper & Park, 2008). However, knowledge of international networks of incubators or accelerators is limited and has not meaningfully incorporated the viewpoint of local networks enabling expansion to international networks. Considering incubators, which are more focussed on venture creation, the absence of the international dimension is understandable. However, the accelerators support the rapid growth of startups; therefore, the embeddedness in relevant networks for internationalisation is essential.

This section has reviewed the extant knowledge of accelerator networks and identified certain shortcomings in the existing literature. The discussion continues next in the area of international opportunities, which lay a conceptual foundation for explaining the phenomena under study.

## 2.2 International opportunity development

Startups with international intentions explore international opportunities, which may or may not lead to the exploitation of international opportunities—that is, foreign-market entry, as operationalised by several authors (e.g., Chandra et al., 2009; Oyson & Whittaker, 2015). The recognition of international opportunities is considered the starting point of internationalisation (Johanson & Vahlne, 2009; Schweizer et al., 2010). Similarly, in the parent field of entrepreneurship, which emphasises opportunities, discussion of international opportunities in the international entrepreneurship has been growing (Blankenburg Holm et al., 2015; Chandra et al., 2009; Chandra, Styles, &

Wilkinson, 2012; Laperriere & Spence, 2015; Lehto, 2015; Mainela & Puhakka, 2009; Mainela et al., 2014).

Due to the routes in entrepreneurship, the discussion in this section starts with a brief overview regarding the debate on entrepreneurial opportunities and the rationale for the choice of the wording ‘development of opportunities’. Thereafter, the section moves to international opportunities. The section addresses especially the research question associated with the explanations for the development of the international opportunities among startups.

### 2.2.1 Entrepreneurial opportunities

Despite the growing focus on opportunities in the domain of entrepreneurship, there is ambiguity in the terminology around entrepreneurial opportunities. Reviewing the literature on entrepreneurial opportunities shows the terminology is diverse and even confusing. The theoretical underpinnings of the opportunity construct are discussed, and the use of ‘opportunity development’ in this study is justified.

Entrepreneurial opportunities constitute positive and favourable circumstances leading to entrepreneurial action (George, Parida, Lahti, & Wincent, 2016). A widely cited definition for entrepreneurial opportunity from Eckhardt and Shane (2003, p. 336) is as follows:

situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means–ends relationships.

The definition is multifaceted. It covers both tangible and intangible product offerings. However, it is not limited to products and services but also covers the customer’s viewpoint through markets and capabilities and through organisational methods. In line with recently increasing entrepreneurial discussion around means as a starting point (Baker & Nelson, 2005; Sarasvathy, 2001), it considers both means and ends, however, also dynamically considering means–ends relationships. Notably, this definition does not seem to require the successful fulfilment of an opportunity. Vogel (2017, p. 8), in turn, provides the following definition:

a favorable combination of endogenously shaped and exogenously given circumstances that make it both desirable and feasible for the entrepreneur to exploit a venture concept and to introduce a potentially value-adding offering into the marketplace.



The idea of value-adding offering includes customers, yet this definition does not posit any interaction with the stakeholders. The endogenously shaped and exogenously given circumstances refer to the parallel existence of opportunities as created and discovered, therefore bearing on the lively debate over discovery versus creation.

Ardichivili, Cardozo, and Ray (2003, p.117) provide a classification of opportunities, which is in Table 3. This classification stresses the perspective of the customers by addressing the value aspect of the opportunities. Yet, this model does not seem to stress co-creation *with* the stakeholders but development to find out value *for* the stakeholders. The other dimension in the classification is value creation capability referring to the venture's capabilities. One way to approach the opportunity-development process of startups is to locate the ventures in the framework, where ventures move from I, II, or III towards IV.

Table 3 Types of Opportunities (Ardichivili et al., 2003, p.117)

		Value sought	
		Unidentified	Identified
Value creation capability	Undefined	I 'Dreams'	II Problem Solving
	Defined	III Technology transfer	IV Business Formation

Accelerators enhance knowledge building, resources, and networks of the startups. Referring to the generic table of opportunities (Table 3) the accelerator period may enable the ventures to acquire the needed resources by expanding networks or acquiring further investment, that is, solving the value creation capability or more clearly identifying the value sought in co-creation with customers.

The literature on entrepreneurial opportunities shows that many scholars (Alvarez & Barney, 2007; Ardichivili et al., 2003; Garud & Giuliani, 2013; Sarasvathy, Dew, Velamuri, & Venkataraman, 2003; Shane & Venkataraman, 2000; Suddaby, Bruton, & Si, 2015; Venkataraman, Sankaran, Sarasvathy, Dew, & Forster, 2012; Welter, Mauer & Wuebker, 2016) have contributed to the discussion of entrepreneurial opportunity. Reviewing these contributions results in the following observations.

Firstly, it seems that scholars represent different views, whether discovery and creation are overlapping phenomena. Alvarez and Barney (2007) position them on the opposite ends of a spectrum and argue that exogenous events trigger opportunity discovery, whereas opportunities are created endogenously. Sarasvathy et al. (2003) in turn, argue the views are defined not to correspond with ontologically subjective or objective notions; consequently, different views on opportunities may coexist.

Secondly, based on the review of contemporary opportunity discussion, the viewpoint of the action–interaction nexus similarly regards the coexistence of opportunities made and found. The design character of entrepreneurship is strongly present in the approach (Venkataraman et al., 2012). Entrepreneurs and different stakeholders create interaction opportunities using materials and concepts which are found.

Finally, the opportunity discussion contains temporal aspects. Referring to Ardichvili et al. (2003), recognition or identification is insufficient without the development of the opportunity and opportunity development is a cyclical, iterative, and active process involving the creative work of the entrepreneurs. Entrepreneurial alertness is a pre-condition whose own antecedents are personal networks and prior knowledge. Therefore, opportunity development is more than mere recognition.

The recognition contains following elements: perception (identifying need or capability, market pull or resource push), discovery (considering market fit), and creation (re-directing and re-combining). Such evaluations, both formal and informal, play a key role in the process. The sequence of the events is not necessarily recognition before development. The active creation of the entrepreneur is required.

Vogel (2017), in turn, argues that opportunities do not comprise separate insights but are exogenously given and endogenously shaped, echoing the notion that opportunities are both discovered and created, which has been expressed by many scholars (Alvarez & Barney, 2007; Garud & Giuliani, 2013; Sarasvathy et al., 2003; Suddaby et al., 2015; Venkataraman, Sankaran et al., 2012).

Reflecting on the models of Ardichvili et al. (2003) and Vogel (2017), both emphasise opportunity development as a process that is iterative and cyclical, and opportunities are both discovered and created. Similarly, both point out that an idea for a venture may be triggered by resource push or market pull, although Vogel (2017) adds another trigger: ‘desire to start’. Both models seem to be missing an explicit notion of co-creation with

stakeholders, which is clearly present in the approach of an action–interaction nexus (Venkataraman et al., 2012) or the early alliances and partnerships of effectuation (Sarasvathy, 2001). Vogel (2017) stresses the influence of the external environment and the individual means and varying degree of opportunity-development embeddedness in an entrepreneur’s social networks; however, the model does not discuss entrepreneurs and stakeholders.

This research leans on the dynamic, iterative, and non-linear approaches. Referring to Ardichvili et al. (2003), the choice of the word ‘development’ instead of ‘recognition’ better captures the nature of the process. Recognising a need or resource is not enough without the development required for a viable business. The choice of the word highlights the active role of the entrepreneur. Among the array of terms – opportunity identification, discovery, exploration, seeking, formation, enactment, assessment, and construction (George et al., 2016) – this research chooses to use ‘opportunity development’ for the above-mentioned reasons.

In sum, given the observations above related to the iterative nature of opportunity development, opportunity development in this study is defined by the following principles:

1. opportunity development takes place as an interplay between venture and different stakeholders (actions and interactions), and
2. opportunity development is an iterative and dynamic process, whereby recognition, evaluation, and exploitation do not happen linearly.

Referring to the earlier discussion of startups and lean startup development and on the other hand, the effectuation logics, there are similarities between these and the above principles of (international) opportunity of this study. The international element is added to the opportunity discussion in the following.

#### 2.2.2 International opportunity construct

The previous section highlighted the central role of opportunities in entrepreneurship. The iterative, non-linear, and interactive opportunity development is in line with the characteristics of the startups. This section discusses the international opportunity (IO) construct in the contemporary literature. Based on a wide and recent literature review of international opportunities, Mainela et al. (2014, p. 120) provide following definition:

a situation that both spans and integrates elements from multiple national contexts in which entrepreneurial action and interaction transform the manifestations of economic activity.

This definition explicitly highlights action and interaction, as have other recent scholarly articles (e.g., Venkataraman et al., 2012). The manifestations of economic activity broadly cover various interpretations of international opportunities. Oyson and Whittaker (2015, p. 308), in turn, derived the definition based on Eckhardt and Shane (2003). The definition is as follows:

an entrepreneurially discovered or created situation that spans and integrates elements from multiple national contexts in which new goods, services, raw materials, markets and organizing methods are conceived as having a potential for exploitation through entrepreneur-led action to form and transform them into new means, ends, or means–ends relationships.

In addition to the elements discussed in the definition by Eckhardt and Shane (2003), this definition contains the cross-border element of multiple national contexts. It also argues for opportunities being both discovered and created. This definition takes a clear stance to the debate as to whether opportunities are discovered, created, or both. Finally, the definition deals with opportunity exploitation. In the international setting, Oyson and Whitaker (2015) operationalise exploitation as an entry to a foreign market. Without the exploitation, the opportunity remains only potentially favourable for entrepreneurial activity. Still, investigations of opportunities, both successes and failures, as defined by Eckhardt and Shane (2003), increase knowledge of entrepreneurial processes. The point of not limiting the attention to the successes is an interesting notion for this study. This study does not select the units of analysis by successful early internationalisation but by the international intention as discussed earlier. The review of selected contemporary empirical studies on international opportunity studies and of one conceptual paper (Mejri & Umemoto, 2010) is captured in Table 4, which indicates a wide variety of perspectives on the construct of international opportunity.

Table 4 International Opportunity Construct in International Entrepreneurship Studies

References	International opportunity construct	International opportunity focussing on
Oyson & Whittaker, 2015; Vasilchenko & Morrish, 2011; Chandra et al., 2009	Exploitation operationalised as entry into international market (sales, export, distribution, sales office, licensing)  Internationalisation as recognition and exploitation of entrepreneurial opportunity that leads to new international market entry	international opportunity from exploration to exploitation (foreign market entry)
Hilmersson & Papaioannou, 2015	The prospect to conduct exchange with new partners in new foreign markets	exchange
Blankenburg Holm et al., 2015; Hilmersson & Papaioannou, 2015	Engage in new foreign business activities with new partners in new foreign markets	novelty in terms of product/customer/market
Lehto, 2015	International opportunity constructed in interaction between seller and buyer aimed at relationship development and mutual value	socially constructed interaction
Nowiński & Rialp, 2016; Vasilchenko & Morrish, 2011	Identification of international business idea (third-person opportunity) and action/internationalisation (first-person opportunity perception) From opportunity exploration to exploitation, exploitation being operationalised as foreign market entry	development process
Oyson & Whittaker, 2015	Integrates elements from multiple national contexts in which new goods, services, raw materials, markets, and organising methods are conceived as having a potential for exploitation through entrepreneur-led action	multiple national contexts
Oyson & Whittaker, 2015	Entrepreneur-led action	the agency of an entrepreneur

Oyson & Whittaker, 2015; Blankenburg Holm et al., 2015	New goods, services, raw materials, markets, and organising methods are conceived as having a potential for exploitation foreign business activities	broad definition of international business activities
Blankenburg Holm et al., 2015	Desirable but uncertain situation enabling the company to engage in new foreign business activities bringing economic value	uncertainty of the environment
Laperriere & Spence, 2015	Internationalisation is a series of opportunity enactments; international opportunity initiates the firm's internationalisation	a series of opportunity enactments
Mejri & Umemoto, 2010	Opportunity recognition and exploitation constitute a reason to internationalise; opportunity for foreign sales can lead to further engagement in internationalisation	The opportunity process at the core and the first-time exploitation equals foreign sales
Chandra et al., 2012	International opportunity development may be considered the unit of analysis instead of focussing on the focal firm	international opportunity development as the unit of analysis
Chandra et al., 2012	Internationalisation is opportunity identification, development and exploitation, which involves multiple actors, organisations, networks and histories	history aspect and path dependency
Lehto, 2015; Nowiński & Rialp, 2016; Mejri & Umemoto, 2010	process of construction – envisioning and enactment – of international opportunities in an interaction between seller and buyer	foreign sales

Based on the review of conceptualisations regarding international opportunity and on the prior discussion revolving around the essence of the opportunities in entrepreneurship, this research argues that international opportunity development is an iterative, non-linear, and interactive process from exploration to exploitation including various direct and indirect parties that enable exchange or presence with economic value in the foreign market. A common operationalisation for the exploitation of the international opportunities is foreign market entry.

The selected studies above indicate a tendency to conduct studies in countries with small home markets, such as Sweden (Blankenburg Holm et al., 2015; Hilmersson, 2015), New Zealand (Oyson & Whittaker, 2015; Vasilchenko & Morrish, 2011), and Finland (Lehto, 2015), showing the importance of early internationalisation for companies originating from small home markets.

A further observation is that the case study is the dominant methodological approach in the reviewed studies. However, the prior studies seem not have taken the perspective of startups but have focussed instead on established SMEs even if they might belong to the category of born globals. Therefore, in line with several calls from various authors (Coviello & Tanev, 2017; Rasmussen & Tanev, 2015), there seems to be room to increase knowledge of simultaneous venture creation and internationalisation, focussing on startup features.

Regarding the internationalisation process, the recognition of opportunities is considered starting point, as stated in the revisited Uppsala model (Johanson & Vahlne, 2009). However, studies on internationalisation do not focus on the emergence of the opportunities. Emerging opportunities are relevant for young entrepreneurial ventures, which define the scope of this study.

The revisited Uppsala model (Johanson & Vahlne, 2009) further argues the process triggered by opportunities may lead to a change in the network position, and the liability of outsidership is turned to insidership in relevant networks leading to successful internationalisation. Thus, the network position – the networks may be local or international – are relevant, and the connections created through networks define the geographical markets a company enters. Country specificity is not as much the key but rather the attempt to improve network position. The conceptual ideas of outsidership

versus insidership have been further empirically researched (Blankenburg Holm et al., 2015; Schweizer, 2013).

Previous studies have argued that networks accelerate the internationalisation of small high-tech firms (Coviello & Munro, 1997) and that small firms may overcome constraints to internationalise through relationships with larger firms (Etemad et al., 2001). Furthermore, some studies show that resources are generated through networks (Coviello & Cox, 2006), that internationalisation and innovation take place through overlapping networks (Chetty & Stangl, 2010), that internationalisation behaviour relates to learning and maintaining networks (Amal & Rocha Freitag Filho, 2010), that international growth is enhanced by both internal and external relationships (Yli-Renko, Autio, & Tontti, 2002), and that networks trigger action on international opportunities (Nowiński & Rialp, 2016).

Similarly, strong evidence has been provided concerning network benefits in the entrepreneurship research (Antoncic & Hoang, 2003). Networks have several benefits for the early-stage ventures and internationalising companies enabling access to power, information, knowledge, capital, other networks, market access, financing, distribution channels, referrals, and contacts for further development (Elfring & Hulsink, 2003; Laperriere & Spence, 2015). To summarise the central findings of this section, this study views the international opportunities as an interactive, non-linear, and iterative process whereby networks play a significant role. The concept of embeddedness closely relates to the networks and is thus the lens through which this study attempts to extend knowledge of the role of accelerator networks for internationalising startups.

### 2.3. The concept of embeddedness

As discussed in the earlier sections international opportunities trigger internationalisation and a wide variety of empirical studies have demonstrated the importance of networks in internationalisation. The perspectives in network studies vary from business versus social (Evers & O’Gorman, 2011; Vasilchenko & Morrish, 2011) and local versus international (Andersson et al., 2013; Boehe, 2013; Leppäaho, Jack, Arenius, & Paavilainen-Mäntymäki, 2018; Leppäaho, Chetty, et al., 2018) to horizontal versus vertical (Evers & O’Gorman, 2011), serendipitous versus planned, and formal versus informal (Tahvanainen & Steinert, 2013). The concept of embeddedness is



central (Granovetter, 1985; Uzzi, 1996) in understanding networks as interpersonal relations and larger social structures, which are socially and historically constructed. Modern research on embeddedness started with an essay from Granovetter (1985), even though already in the 1940s Polanyi had introduced the term ‘embeddedness’ (Dacin, Beal, & Ventresca, 1999), referring to traditional societies with reciprocal economic relationships.

Johannisson, Ramírez-Pasillas, and Karlsson (2002) use a definition of embeddedness as anchored in a larger structure. Considering the topic of this study, the startups become anchored in larger structure – accelerator – and through that accelerator they are connected to a broader industry network. Notably, as Jack and Anderson (2002) stress, becoming embedded is more than simply developing social networks. This study aims to understand how accelerator networks enable startups to become embedded in relevant edtech-related networks for internationalisation. As the conceptualisation of embeddedness suggests, entrepreneurs have interpersonal relations with each other and with actors in the network. Entrepreneurs belong to the larger social structure that has emerged over time and is constantly evolving; that is, the nature of the networks is dynamic (Halinen & Törnroos, 1998; Johannisson et al., 2002), a definition that suggests constant evolution and change instead of a static view of agency and structure.

### 2.3.1 Studies on network embeddedness

This section reviews briefly studies of network embeddedness from the point of view of two research streams: international entrepreneurship (Table 5) and entrepreneurship perspective (Table 6). As this study is cross-disciplinary, the research must be approached with regard for the traditions from both streams of literature. The study’s purpose is to investigate how to approach the early internationalisation of startups using the perspective of network embeddedness.

Generally speaking, in organisation and business studies, firms and networks are embedded in several coexisting networks, such as time, space, social structures, markets, and technological and political systems (Halinen & Törnroos, 1998). Hess (2004) addresses the multifaceted concept of embeddedness by addressing the following question: ‘Who is embedded in what?’ This question is addressed in the following analysis, which reveals differences in the unit of analysis and in the studied contexts,

also included in the analysis to stress the importance of context in the study of embeddedness.

Table 6 demonstrates that entrepreneurship studies often focus on the nexus between entrepreneurs and the contexts in which they are embedded – places, systems, communities, and networks – although there are also studies focussing on firms' embeddedness in a context (Johannisson et al., 2002; Elfring & Hulsink, 2003; Shaw, Wilson & Pret, 2017). As indicated in the Table 5, in internationalisation studies the unit of analysis is often the firm. The internationalisation studies seem to rely on the traditions of business networks rather than on social networks. The analysis shows that since business, social, and entrepreneurial networks exhibit different approaches and viewpoints, an analysis combining social and business networks helps develop an understanding of networks in entrepreneurship (Slotte-Kock & Coviello, 2010). Business network studies are focussing on transactions, whereas entrepreneurial network studies (Antonicic & Hoang, 2003; Lechner, Dowling, & Welp, 2006; Slotte-Kock & Coviello, 2010) stress social networks. Even so, the approaches partially overlap, demonstrating the closeness of entrepreneurial and internationalisation processes. Social networks acknowledge the role of individuals and their social networks. The knowledge is socially embedded, and the acquisition of information, knowledge, advice, and resources occurs through interpersonal and inter-organisational social networks, creating social capital.

Table 5 Studies of Internationalisation through the Lens of Network Embeddedness

References	Methodological approach	Key findings	The role of context (Welter, 2011)	Who is embedded in what? (Hess, 2004)	Other remarks
Andersson et al., 2013	Explorative multiple case study of four companies within one industrial context, i.e., medical technology cluster in France	Differing roles for local and international networks in internationalisation  Influence of cluster characteristics on the network and the local networks, which play a major role in the internationalisation	The characteristics of the location and industry sector characteristics	French medtech companies in local and international industry sector-related business networks	One-quarter of studied companies labelled born globals, but not studied during/shortly after inception; other companies labelled born-again globals
Leppäaho, Chetty, et al., 2018	Comparative case study in multinational context among six biotech entrepreneurs in three countries: Finland, New Zealand and Canada  Level of analysis: company	National differences in the type and role of network ties regarding following network actors: universities, research institutes, sales channels and partners, and financiers and customers  Shows the need for study of entrepreneurship and context	International context-based comparison of local and international network ties within an industry sector	Internationalising as embedding in foreign context, both through business and social networks  Biotech ventures in three different national contexts	Research focusses on micro-processes of network embeddedness  Early internationalisation and small markets are involved
Boehe, 2013	Quantitative survey study among Southern Brazilian furniture manufacturing SMEs facilitated by a membership in an industry association	Local collaboration intensity positively related with export intensity  Results moderated by distance: longer distance to cluster centre = less likelihood to export propensity	Context of an emerging economy and within one industry sector, i.e., furniture	SMEs in horizontal domestic or regional business networks	Research focussed on collaboration at inter-firm level

Keeble et al., 1998	Survey among 100 technology-intensive firms in Cambridge-Oxford region	Internationalising firms show above average levels of local networking, i.e., linkage of internationalisation and successful local embeddedness	Within high-technology cluster (no specific industry sector) within a region in UK among firms that need to internationalise their activities early due to niche market	Firms in local business networks	Sample firms are not close to inception but are more mature, despite the viewpoint of niche market forcing internationalisation
Colovic & Lamotte, 2014	Multiple-case study with four case organisations  Analysis divides firm level from group level	How formal clusters facilitate internationalisation  Network embeddedness helps to overcome resource constraints  Clusters provide resources, networking opportunities, and legitimacy to facilitate internationalisation	French context of formal and policy driven cluster representing a specific form of a cluster	Internationalising firms in local cluster	Findings stress the intermediary role of a cluster
Sigfusson & Harris, 2013	Comparative case study in two technology sectors with different backgrounds. The focus is on the firm but also on the relationships of the entrepreneurs.	The focus on how entrepreneurs find, develop and use different types of relationships for their internationalisation and furthermore, analyse the presence of domestic market.	Small home market context (Icelandic) and two different industry contexts (marine-tech and game-tech)	The relationships to domestically and internally embedded parties.	The relationship development and embeddedness are viewed at several time points instead of static analysis
Musteen, Datta & Buts, 2014	Quantitative study to test hypotheses	Empirically developed and tested model for SME internationalisation and network	Context of transition economy	SMEs in foreign networks	The research examines the role of structural and relational embeddedness

Table 6 Entrepreneurship and Small Business Studies through the Embeddedness Lens

References	Methodological approach	Key findings	The role of context (Welter, 2011)	Who is embedded in what? (Hess, 2004)	Other remarks
Johannisson et al., 2002	Survey method and social network analysis	Several layers or orders of embeddedness proposed: first-order (firm-to-firm), second-order (firm relations to social and economic institutions) and third-order (indirect firm relation to through social and economic institutions)	Model applied in Swedish furniture industry	Firms in inter-firm networks and social and economic institutions	Drawing on institutional theory
Jack & Anderson, 2002	Qualitative, longitudinal ethnographic inquiry among rural entrepreneurs	Illustration of the process how entrepreneur embed in systems  Contributes to mechanisms and nature of embedding in a selected narrow context to explain the complexity of the phenomenon	Entrepreneurs in remote rural areas	Entrepreneur-driven approach  Entrepreneurs in larger social context	Becoming embedded as becoming part of the structure and more than simply developing social networks, including understanding the structure, enacting or re-enacting the structure, and maintaining the link and the structure  Networks as mechanism for embeddedness
Elfring & Hulsink, 2003	Exploratory case-based study	Nuanced knowledge on opportunity discovery, securing resources, and gaining legitimacy	High-tech startups	Ventures embedded in networks	Proposes the mix of strong and weak ties is the key process of the early-venture growth

McKeever, Jack & Anderson, 2015	Qualitative study with ethnographic perspective including participant observations.	Study focussed on entrepreneurial engagement with the community and how it influences entrepreneurial practices and outcomes  Results show value of embeddedness for entrepreneurs and social and economic benefits for the community	Two communities in the Northwest of Ireland	Entrepreneurs in community	Challenges the limited view of considering embeddedness as one-way relationship
Shaw et al., 2017	Interpretative case study	Study illustrates process of embedding and the interplay of pre-embeddedness, embedding mechanisms, and outcomes	Within the creative industry	Small firms in industry context	The use of networks as an embedding mechanism; entrepreneurs embedded in networks, places and communities
Korsgaard, Ferguson & Gaddefors, 2015	Multiple case study	Placial embeddedness results from the intimate knowledge of immediate context and strategically built non-local networks	Small rural areas in Denmark	Entrepreneurs in their immediate environment	Encourages for further research into how different contexts are bridged  Difference between spatial vs. placial context
Busch & Barkema, 2020	Explorative case study	Studying embeddedness from the extreme uncertainty perspective and demonstrating the importance of social structure that allows flexibility	Incubator in Kenya	Entrepreneurs embedding in networks facilitated by an incubator	Nascent ventures

Referring to the tables of selected studies, a typical distinction in the internationalisation studies is to focus on either local (Boehe, 2013; Colovic & Lamotte, 2014; Keeble et al., 1998) or international networks (Musteen et al., 2015) or, alternatively, to include both (Andersson et al., 2013; Leppäaho, Chetty et al., 2018; Sigfusson & Harris; 2013). The studies highlight the spatial element by focussing on firms in different national contexts and industries and by showing how firms are embedded in regional clusters (Andersson et al., 2013; Colovic & Lamotte, 2014; Keeble et al., 1998) and industry associations (Boehe, 2013). Whereas formal clusters are defined as ‘geographic concentrations of actors characterised by formal governance and formal membership of firms and other institutions’ (Colovic & Lamotte, 2014, p.451), the nascent entrepreneurs in emerging fields – the focus of this research – are part of entrepreneurial ecosystems, as discussed in section dealing with accelerators. Entrepreneurial ecosystems, in contrast to clusters, are characterised by the opportunity perspective, the de-centralised nature of activities and actors, and the digital offerings of businesses.

Spatial embeddedness is significant in internationalisation studies, as in most of them the context is defined by a country, region, or industry cluster. According to Welter (2011), the spatial dimension refers to geographical environments such as countries, communities, and clusters, and it manifests through the characteristics of physical business location, business support infrastructure, or the characteristics of local communities and regions.

Hess (2004) argues that a spatial component exists in network embeddedness, as the network with its actors do have a concrete location. The spatiality is, however, not a precondition for network embeddedness, as network embeddedness is about the connections between actors, regardless of their geographical location. In line with this notion, Korsgaard et al. (2015) use the term ‘placial embeddedness’ to differentiate the immediate physical location from the larger socio-material locality in which entrepreneurship takes place; in their study, this distinction rests on the immediate environment versus the non-local strategic network relationships. This insight is particularly interesting for the present study, which deals with entrepreneurs with a digital offering and having a global marketplace. The spatial dimension of this study is indeed multifaceted. The location of the accelerator is in Finland, but the networks and ventures in an international accelerator are beyond one geographical context. Thus, the

above discussion relates to the definition of spatial context and is significant for this research.

Regarding the evolution of the internationalisation, the studies often focus on so called born globals or international new ventures but do not capture emerging internationalisation from inception. The studying of local embeddedness in large home markets such as the UK (Keeble et al., 1998) or France (Andersson et al., 2013; Colovic & Lamotte, 2014) presents a different research setting than that of small home markets, since large markets do not require immediate internationalisation after inception.

Regarding venture type, startups are seldom present in internationalisation studies or entrepreneurship studies. A recent study on social embeddedness in extreme uncertainty (Busch & Barkema, 2020) was situated in an incubator. Thus, that study bears some contextual similarity to the present study. Busch and Barkema (2020) conducted their study in an emerging market, though, and in that respect, their work's context differs. Subsequently, instead of a singular context, it is often more appropriate to speak about the contexts of the study. The notion of multiple contexts has also been recognised as an area in which embeddedness studies would benefit from further advancement. There are calls to approach embeddedness as a multi-layered phenomenon conceptualising various different layers (Wigren-Kristofersen et al., 2019).

A further observation based on the review above is methodological, related to the incorporation of context (Welter, 2011). Most of studies are multiple case studies showing the dominance of the case study method in the network studies of internationalisation. Notably, the very strength of the case study method – that is, its rich, holistic, and contextual approach – does not play a major role in the existing studies. The studies rely mostly on interviews or surveys instead of utilising naturally occurring data and extensive field studies. In sum, studying embeddedness in international entrepreneurship would benefit from a contextualised approach, which, in turn, has an impact on the methodological choices.

Contrary to network embeddedness in internationalisation, the topic of embeddedness in entrepreneurship has been examined in studies that stress the complexity of the process of embedding in selected and narrow contexts (Jack & Anderson, 2002; Shaw et al., 2017). Stressing the complexity in entrepreneurship studies, in turn, shows in the methodological choices for the entrepreneurship studies. The use of methods like



ethnography, which are more difficult to find in internationalisation studies using the lens of embeddedness, were listed in Table 6. On the other hand, there are studies aiming for a variable-based approach, such as that of Elfring and Hulsink (2003).

McKeever et al. (2015) stress the influence of entrepreneurs in a community – that is, the mutual influence of agency and structure; thus, they challenge the somewhat limited consideration of embeddedness as one-way relationship. There have been recent attempts to increase knowledge of the dynamic nature of embeddedness, diverging from the static viewpoints that have dominated the research (Wigren-Kristofersen et al., 2019).

Entrepreneurial studies of embeddedness have also addressed multiple levels of embeddedness, such as in Johannisson et al.'s (2002) discussion of three orders of embeddedness: from the firm-to-firm level to that of the firm in the larger social and economic environment. Slotte-Kock and Coviello (2010), in turn, suggest that embeddedness should be viewed more broadly than an entrepreneur or firm embedded in a network or social context; consequently, they compare multiple levels of analysis. The entrepreneur or firm is endogenous to the network and broader system, and the network is exogenous to the firm or entrepreneur but endogenous to the broader system, which is exogenous to all the levels of analysis mentioned earlier. Consequently, a study may contain multiple contexts, or the context may contain multiple layers. The literature on entrepreneurial contexts (Autio et al., 2014; Zahra & Wright, 2011; Zahra et al., 2014) refers to different classifications containing contexts such as business (industry and market), social (networks), spatial (geographical areas, industry districts and clusters), temporal, and institutional (social and cultural; political and economic system). The authors seem to agree on the importance of incorporating the context in studies of entrepreneurship and on the lack of agreement in terms of contextual classification.

Referring to the importance of the context discussion, Welter (2011) argues that entrepreneurship research has overemphasised individuals and underemphasised context. Both Pellinen (2014) and Welter (2011) stress not only the contextual influences of the entrepreneurs but also the entrepreneurs' influence on the context. As captured in Table 6, McKeever et al. (2015) focus on two communities and demonstrate how entrepreneurs shape communities as communities likewise shape entrepreneurial activities.

Considering the focus of the research, this research would enable several options for the level of analysis. There is a connection between the choice regarding the level of analysis and the network perspective. Depending on the perspective, the focal firm is considered endogenous to the network, external factors have an exogenous impact on the network, or all levels are present. The context of entrepreneurship studies is often that of a community, which may interestingly refer to a space, mechanism or context (Busch & Barkema, 2020). When this argument is applied to the research at hand, it means that the accelerator as a community could be approached from different viewpoints. The choice of conceptualising accelerator networks as an embedding mechanism is based upon studies by Jack and Andersson (2002) and Shaw et al. (2017), which both conceptualise networks as embedding mechanisms.

Throughout the discussion of embeddedness, it has become clear that startups (and other types of companies) become embedded in several contexts. Various streams of literature provide different responses to the question of ‘who is embedded in what’ (Hess, 2004). The context(s) of embedding cannot be simply defined. Considering the relevant streams of literature for this study, a multitude of classifications may apply to contexts, as the discussion above highlights in the case of international business networks (Halinen & Törnroos, 1998) or entrepreneurial contexts (Autio et al., 2014; Zahra & Wright, 2011; Zahra et al., 2014). In this study, the unit of analysis is a startup venture that has joined an accelerator in the Finnish context. Startups are embedded in accelerator networks, which are an embedding mechanism for broader networks in an industry. Conceptually, the challenge is the treatment of the spatial dimension, as despite their physical locations, ventures and accelerator networks represent a globally mixed setting.

### 3. Synthesis of the theoretical background and conceptual framework

The starting point in the literature review was the need for cross-disciplinary discussion in the study of internationalising startups that participate in an accelerator programme to enhance their growth and internationalisation. Chapter 2 has demonstrated the central concepts of this study as expressed in the literature. The research is positioned at the intersection of several literature streams, which have guided the discussion of the theoretical background. Similarly, Table 7 is organised by different streams of literature.

Table 7 Summary of the Theoretical Background and Literature Review

Concept	Stream of literature	Relevant definitions	Gaps and challenges	Potential contributions to the entrepreneurship literature
<b>Accelerator</b>	Innovation	Constructs and building blocks (Pauwels et al., 2016)	Novel research area, limited academic research, existing studies have mainly focussed on US market	The role of accelerators fostering early-stage ventures with their attempts to internationalise
	Entrepreneurship	Evolution from incubators to accelerators (Mian et al., 2016) Cohort-based and fixed-term programme (Hathaway, 2016; Cohen & Hochberg, 2014) Intermediary in entrepreneurial ecosystem (Goswami et al., 2018)	Very limited understanding of accelerators and internationalisation of startups (e.g., Kabbara, 2016)	
<b>International opportunity</b>	International entrepreneurship	A process from exploration to exploitation (Blankenburg Holm, Johanson, & Kao, 2015; Chandra et al., 2009; Mainela et al., 2014; Oyson & Whittaker, 2015), international opportunities and starting point for internationalisation	Nascent ventures with parallel process of venture creation and international opportunity development (Stayton & Mangematin, 2016)  Lack of studies approaching internationalisation from the entrepreneurship viewpoint (Fletcher, 2004), focus on companies with international intentions (Coviello, 2015)	Parallel process of venture formation and internationalisation
<b>Embeddedness</b>	Entrepreneurship	Becoming part of the structure, social networks as a mechanism for becoming embedded (Jack & Andersson, 2002)	Conceptualising multi-layered embeddedness (Wigren-Kristofersen et al., 2019) and multiple layers of embeddedness (Welter, 2011)	Networks as an embedding mechanism for early internationalising startup ventures and problematising the concept of context(s)
	International entrepreneurship/ international business	Turning 'liability of outsidership to insidership' (Johanson & Vahlne, 2009)		

The literature review posed the following question: How do accelerator networks enable startups to develop international opportunities? The research question is discussed next in light of the literature review, and an initial conceptual framework is presented, which guides the empirical inquiry.

The starting point for the study was empirical observation within a certain spatial context, the emerging edtech sector in Finland, where – despite a good international reputation and high scores in several international comparisons – international sales in the sector have remained modest. The inquiry was initially limited to young entrepreneurial ventures, which specialise in education technology; thus, this study consciously excludes institutional exports of education, which have different characteristics than do young ventures. The entrepreneurial focus on the phenomenon led to an examination of startup-support mechanisms, such as accelerators. The earliest phase of the literature review demonstrated that little is known about the role of accelerators in the early internationalisation of startups. Thus, that process became the starting point for the research: the phenomenon of internationalising startups and the role of accelerators.

Based on the review, accelerators are defined by their programmes (Cohen & Hochberg, 2014; Hathaway, 2016; Isabelle, 2013; Kabbara, 2016; Miller & Bound, 2011; Pauwels et al., 2016; Surlemont et al., 2002) and as ecosystem intermediaries or builders (Autio et al., 2018; Drori & Wright, 2018; Goswami et al., 2018). They are divided into sector-based and general accelerators (Pauwels et al., 2016), where the former is more relevant for this study, which deals with edtech ventures.

In terms of spatial contexts (Welter, 2011), accelerators have origins in a one particular geographic context – the US market – and therefore, many accelerator studies are conducted in the US. Accelerators host startups, which by definition seek scalable business models (Blank, 2013) and, therefore, must internationalise from their inception if they originate in small home markets. With regards to this necessity, Rasmussen and Tanev (2015, p.12) refer to Blank, who puts it as follows: ‘a scalable startup typically requires a local population >100 million people. If your country doesn’t have that you need to be born global. Your county/industry needs a go global playbook’. According to Coviello (2015), however, despite extensive study of so called born globals, the literature contains research gaps in terms of early internationalising ventures, as the viewpoint so far has been that of retrospective studies of born globals who were able to

make it to foreign markets, instead of emerging startups and their emerging internationalisation.

Accelerators host nascent entrepreneurial ventures, and the opportunity viewpoint has been a dominant paradigm in entrepreneurship (Eckhardt & Shane, 2003; Shane & Venkataram, 2000; Venkataram, 1997) and, increasingly, in international entrepreneurship (Mainela et al., 2014). Thus, early internationalisation is conceptualised through the literature on international opportunities, and following prior studies (Chandra et al., 2009; Oyson & Whittaker, 2015), this study operationalises the exploitation of international opportunities as foreign market entry. This study draws on a research tradition that defines opportunities as developed in an iterative, non-linear, and interactive manner. The selection of ‘development’ (Ardichvili et al., 2003) as a definition for opportunities is reasoned by the scope of startups. Startups go through iterative product and business model development instead of rigid planning (Blank, 2003; Osterwalder & Pigneur, 2010; Ries, 2011), and, parallel to venture creation, many startups start internationalising early (Stayton & Mangematin, 2016). This notion significantly influences the research, as the exploitation of international opportunities may not even be an option if product development remains under way. Nevertheless, a startup may be already exploring international opportunities, which shows the non-linear character of startup developments.

The chosen definition of international opportunities stresses also ‘interaction’; thus, the accelerator networks play a significant role. Startups in an accelerator are exposed to various networks (Vandeweghe & Fu, 2018), depending on sector-specific or general focus. Considering the emergent nature of startups and accelerators, which are often startups themselves (Bliemel et al., 2016; Goswami et al., 2018; Pauwels et al., 2016), accelerators differ from industry associations and formal clusters, which have been studied from the perspective of fostering internationalisation through networks (Andersson et al., 2013; Boehe, 2013; Colovic & Lamotte, 2014; Keeble et al., 1998).

The concept of embeddedness relates closely to that of networks, referring to companies being embedded in networks of interpersonal relationships and larger social structures (Granovetter, 1985; Johannisson et al., 2002). A review of studies using the concept of embeddedness and internationalisation, as well as new ventures, leads to insights that include multiple layers of embeddedness (startup, accelerator, networks, and broader context of industry sector) and spatially local and international relationships. As a result

of the review, this study acknowledges the complexity of the context and approaches the context holistically at multiple levels. The coexistence of networks and entrepreneurs embedded in several contexts is not necessarily revealed in the somewhat static studies on network embeddedness and entrepreneurship, and there are recent calls (Wigren-Kristofersen et al., 2019) for entrepreneurship studies that would consider embeddedness in entrepreneurship studies as dynamic, processual, and multi-layered phenomena.

Resulting from two theoretical arguments – multiple level of analysis and mutual influence – the conceptual framework shows the multi-layered nature of embeddedness (Slotte-Kock & Coviello, 2010) and, moreover, the dynamic element by acknowledging that ventures are influenced by context and influence context (Pellinen, 2014; Welter, 2011). Furthermore, the framework is inspired by the insights that internationalisation is a process of becoming embedded in relevant networks (Johanson & Vahlne, 2009) and that networks are a mechanism for embeddedness (Jack & Anderson, 2002).

Figure 5 illustrates the elements of the conceptual framework for this study. It incorporates startups as a unit of analysis, along with the accelerator and accelerator networks, which are all embedded in a broader context such as industry or sector. The phenomenon is the development of international opportunities, an interactive process, which is explained through accelerator networks. The framework shows the multiple levels of local and international interaction that the accelerator facilitates. These levels are as follows: startups among themselves, startups and accelerators, accelerators and accelerator networks, and finally, startups and accelerator networks. Referring to the accelerator literature (Vandeweghe & Fu, 2018), the networks may be considered internal and external, where the latter refers to accelerator networks in Figure 5. Investigating the micro-processes of accelerator networks that enable accelerated and internationalising startups to become part of a larger structure – the emerging edtech sector – can contribute valuable insight.

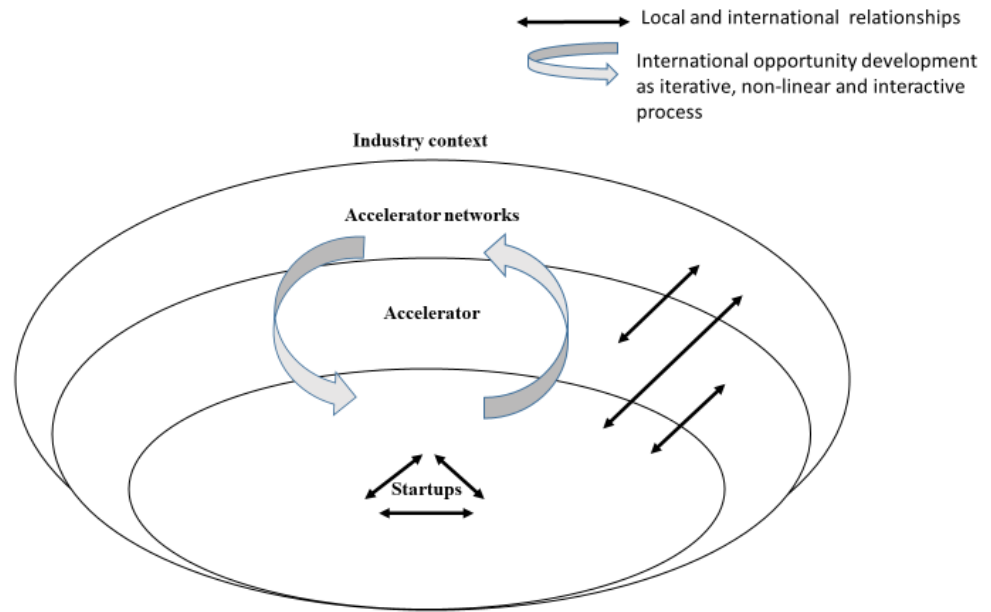


Figure 5 Initial framework.

During the literature review, the initial research question was further crystallised to address accelerator networks as embedding mechanisms for internationalising edtech startups. The framework above serves as a starting point in this case study. In line with abductive approach, the framework is modified, as the theoretical knowledge is confronted with the empirical findings. This study aims to explain international opportunity development among startups in an accelerator. Following a critical realist paradigm (Easton, 2010), the causality is defined by a question ‘what makes it happen’, that is, the interest is, particularly, in what generates, creates, determines or enables international opportunities. Context is included in the explanation. The methodological underpinnings of this research are discussed in Chapter 4.



## 4. Methodology

This chapter discusses the philosophical underpinnings of the study, the selected methodological choices, and finally, the research design, that is, for data collection and analysis. The chapter closes with a discussion of the methodological evaluation of the study. Throughout this chapter, and in line with abductive approach, the idea is to justify a meaningful link between the core elements of this research: theory, method and empirical inquiry (Dubois & Gadde, 2002; Dubois & Gadde, 2014).

### 4.1 Philosophical underpinnings of the study

Guba and Lincoln (1994) stress that the scientific inquiry begins with the assumptions of the researcher about reality, arguing a ‘worldview that defines, for its holder, the nature of the “world”, the individual’s place in it, and the range of possible relationships to that world and its parts’. Paradigms in social sciences are belief systems based on ontological, epistemological, and methodological assumptions, and the paradigms are described and categorised through practical issues such as the aim of the inquiry, the nature of knowledge, knowledge accumulation, quality criteria, value, ethics, voice, training, accommodation, and hegemony (Guba & Lincoln, 1994).

The philosophical assumptions of this study are based on the paradigm of critical realism, which takes reality as material but acknowledges that people interpret reality differently in different times and contexts (Bhaskar, 2013). Critical realism, as a philosophical position, acknowledges the nature of complex phenomena and the need for holistic explanations (Easton, 2010). Critical realism has an increasingly significant role in the social sciences, including studies of the discipline of entrepreneurship (e.g., Leca & Naccache, 2006; Lee & Jones, 2008). One of the reasons critical realism has gained popularity in entrepreneurship studies is that it allows to run contextualised studies (Blundel, 2007), and being mindful of context is a central aspect of studying entrepreneurship (Chalmers & Shaw, 2017; Welter, Baker, & Wirsching, 2019; Zahra, 2007; Zahra & Wright, 2011).

Critical realism is positioned to leverage elements from both positivist and interpretivist paradigms by acknowledging the subjective knowledge of social actors and the existence of independent structures (Wynn & Williams, 2012). The stratified ontology is based on the following domains: real, actual, and empirical as Table 8 (Wynn & Williams, 2012, adapted from Bhaskar, 1975, p. 13) shows. The real corresponds to the structures and mechanisms existing independently from our ability to perceive them; the actual refers to the events generated by the real, which may or may not be observed; and the domain of the empirical comprises the experiences actually observed.

Table 8 Stratified Ontology of Critical Realism

(Wynn & Williams, 2012, adapted from Bhaskar, 1975, p. 13)

	Domain of Real	Domain of Actual	Domain of Empirical
Mechanisms	x		
Events	x	x	
Experiences	x	x	x

The case study approach is in line with the assumptions of critical realism, allowing causalities and explanations to emerge in an open system; that is, different causal mechanisms may coexist, and different outcomes may result from same causal powers (Easton, 2010; Ragin, 2009). Sayer (1992) provides an extensive philosophical justification for the use of case studies. Critical realism enables one to answer questions of causality, that is, allowing causalities but not in law-like general terms – rather, considering the rich contextual nuances of the research setting. The real constitutes causal structures and mechanisms. For realists, generality is different from recurrent regularity (Tsoukas, 1989). Therefore, generalisation occurs at the level of theory. Methodologically, this study aims to capture the complexity of the studied phenomenon – internationalisation of edtech startups – through a case study approach. This research engages questions of causality as described above, and a case-study is considered suitable for critical realist assumptions, as argued by Easton (2010).

#### 4.2. Research strategy and approach

My research is an in-depth, qualitative case study. There is no consensus in the methodology literature on what defines a case study. The disciplinary traditions,

philosophical underpinnings, decisions on case design and data sources, and purposes for theorising and reporting the case study are factors that define case studies for different authors (e.g., Bennett, 2004; Creswell, 1994; Eisenhardt, 1989; Stake, 2005; Yin, 1994). Among the wide variety of definitions, this study draws on the definition of Piekkari et al. (2009, p.569): ‘A case study is a research strategy that examines through the use of variety of sources, a phenomenon in its naturalistic context, with the purpose of “confronting” theory with the empirical world’. This definition underlines the use of case studies for various theoretical purposes.

The characteristic feature of case studies is a holistic approach to examine a phenomenon in a real-life context (Flyvbjerg, 2006). The approach in my research is abductive, according with the selected case study definition above. The abductive approach in this study has been inspired by, for example, Dubois and Gadde (2002), who emphasise that redirections are expected when the theory is confronted with empirics. Easton (2010), in turn, argues that the boundaries of a case study commonly change during the research process. A critical realist case study is well suited to complex phenomena such as organisations and relationships between organisations or networks of organisations (Easton, 2010). Thus, a critical realist case study is well suited for this study, which sets out to explain how accelerator networks enable internationalising startups become embedded in relevant sector-specific local and international networks.

Referring to Welch et al.’s (2011) typology, presented in the following figure, this study has been inspired by contextualised explanation as a method of theorising from a case study. The philosophical orientation in the contextualised explanation, as defined by Welch et al. (2011), is often critical realism. Contextualised explanation aims to treat context analytically instead of descriptively and does not aim at law-like generalisations; on the contrary, it assumes the contingency of cause–effect relationships. The aim of the contextualised explanation is to generate causal explanations and incorporate context.

Emphasis on contextualization	Strong	<b>Interpretive sensemaking</b> <ul style="list-style-type: none"> <li>• Interpretive/constructionist</li> <li>• Search for meanings</li> <li>• Understanding of subjective experiences</li> <li>• Thick description</li> <li>• Particularization</li> <li>• Contextual description necessary</li> <li>• Causality simplistic and deterministic</li> <li>• e.g. Stake</li> </ul>	<b>Contextualized explanation</b> <ul style="list-style-type: none"> <li>• Critical realist</li> <li>• Subjective search for causes</li> <li>• Explanation causal mechanisms</li> <li>• Contingent and limited generalizations</li> <li>• Context integrated into explanation</li> <li>• Strong form of causality</li> <li>• e.g. Ragin/Bhaskar</li> </ul>
	Weak	<b>Inductive Theory building</b> <ul style="list-style-type: none"> <li>• Positivist</li> <li>• Search for generalities</li> <li>• Testable propositions</li> <li>• Inductive</li> <li>• Generalization to population</li> <li>• Contextual description a first step</li> <li>• Weak form of causality, proposing associations</li> <li>• e.g. Eisenhardt</li> </ul>	<b>Natural experiment</b> <ul style="list-style-type: none"> <li>• Positivist</li> <li>• Objective search for causes</li> <li>• Explanation cause-effect linkages</li> <li>• Internal validity</li> <li>• Generalization to theory</li> <li>• Causal relationships are isolated from the context of the case</li> <li>• Specifying cause-effect relationships</li> <li>• E.g. Yin</li> </ul>
		Weak	Strong
		Emphasis on causal explanation	

Figure 6 Contextualised explanation in comparison to other methods of theorising from case studies (adapted from Welch et al., 2011).

#### 4.2.1 Single case study with embedded cases

The selected research strategy in this study is a single case study with embedded cases. This section discusses different case study strategies and justifies the choice of single case study in this research. Within the case study paradigm, there are different schools of thought. Langley and Abdallah (2011) differentiate between the Eisenhardt template and the Goyia template, acknowledging the well-known authors who represent the comparative case method (Eisenhardt) and the more holistic and interpretative method (Goyia). These templates resonate well with the typical classification of multiple case studies and single case studies. The templates differ significantly in terms of their relation to the context, however. Situation specificity may be regarded as a problem (Yin, 1994) or as an opportunity (Weick, 1979). If situation specificity is considered a weakness, the authors argue for replication and multiple case studies (e.g., Eisenhardt, 1989), whereas other authors (e.g., Dyer & Wilkins, 1991) have pointed out that multiple case studies neglect context; furthermore, they exhibit the very strengths of the classical single case studies, which have been central to organisational studies. However, attempts have also been made to combine the best features of both approaches. Leonard-Barton (1990), for example, proposes dual methodology that mixes the two types.

In summary, single case studies have the strength of rich contextual insights to discover new theoretical interdependencies unavailable if many contexts are investigated. The question revolves around the trade-off between breadth and depth of insight. Cross-case studies and single case studies are used for different purposes. The studies have different objectives and lead to different types of theoretical contributions (Langley & Abdallah, 2011). Therefore, the evaluation criteria for the different types of case studies also differs.

Table 9 highlights core differences in single and multiple case studies and arguments speaking for and against both designs. In addition, it lists key authors, who are advocates of one of the case study designs. As the table shows, the choice between single and multiple case study is a trade-off between depth and breadth. Thus, no single template for a thoroughly conducted case study is the correct template, *per se*. The main issues seem to be coherence and consistency, whichever of the two options is chosen.

Table 9 Contrasting Single and Multiple Case Studies

References from the methodology literature	<b>Single case studies</b> (Dyer Jr & Wilkins, 1991; Flyvbjerg, 2006; Gummesson, 2007; Ragin, 1992)	<b>Multiple case studies</b> (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 1994)
<b>Arguments pro</b>	<p><b>Microscopic view</b> In-depth insights provide a nuanced view of reality</p> <p>Examination of details of the process</p> <p>Context-dependent expertise at the core of human learning</p> <p>Character of social sciences as non-independent, non-predictive science</p> <p><b>Naturalistic view</b> Rigor of case studies differs from quantitative methods</p> <p>Close proximity to real-life situations and test views as the phenomena unfold in practical context</p> <p>Narratives are able to capture the contradictions and complexities of real world</p>	<p><b>Replication logic</b> Replication logic considered more robust</p> <p>Not statistical</p> <p>Given that analytical power is multiplied by adding cases, +3 cases = 3× analytical power</p> <p>Case studies create testable hypothesis; multiple case studies likely to result in better theories</p>
<b>Arguments against</b>	<p><b>Subjectivity</b> Bias towards verification, i.e., to confirm researcher's preconceived notions</p> <p>Low generalisability</p> <p><b>Descriptive</b> Considered pilot studies</p> <p>Descriptive 'tell little about lot' anecdotes</p> <p>Difficult to summarise and generate general propositions</p>	<p><b>De-contextualised</b> Not capturing the uniqueness (the nature of unique observations in social sciences)</p> <p>Issues with replicating observations (time, situation, researcher changes)</p> <p>Mechanical way of describing context</p> <p>Context not included in analysis nor conclusions</p>

The essential difference between single and multiple case study is whether comparisons are completed across organisational contexts or within the same organisational context. A single case study was selected for this research. This choice was made based on the nature of the studied phenomenon. Halinen and Törnroos (1998) present reasons to

choose single case studies to study connectedness when a number of actors need to be researched and when context specificity complicates the process. Considering the accelerators as hubs bringing together several types of actors, the research setting speaks for the choice of the single case study.

However, single case studies may contain sub-units, that is, embedded case studies, as is the case in my research as well. Baxter and Jack (2008) argue that context is key. If embedded cases share context, the research is a single case study with embedded cases. Multiple case studies, in contrast, are conducted across various contexts. The embedded cases, which represent all the same context, may also be analysed within, between, and across cases. The challenge of the analysis lies in the return to the initially addressed larger issue instead of remaining at the sub-unit level.

Regarding this research, the context is the Finnish edtech sector, and the case is the development of international opportunities for edtech startups in an accelerator. The embedded cases are internationalising startups; that is, the development of international opportunities at single startup level in the given context. The embedded cases represent the same context, and therefore, embedded cases are analysed as described above within and across cases. Figure 7 highlights the relationship of the case, embedded cases, and context in this research.

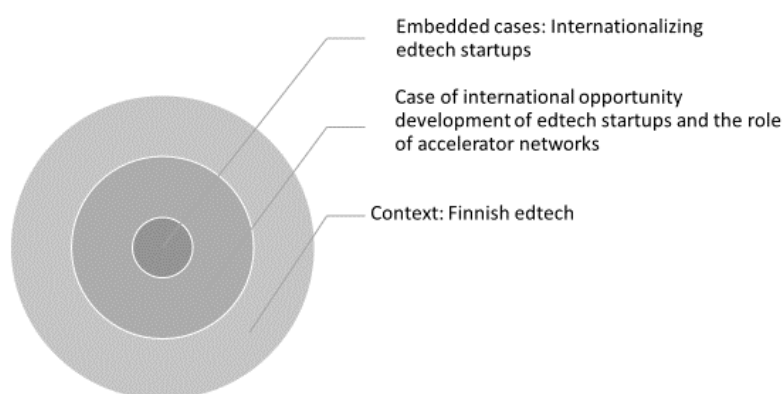


Figure 7 The relationship of case, embedded cases, and context.

The question ‘what is a case’ is fundamental in case study research, and Ragin (2009) argues for casing – that is, setting boundaries for the case study – which resonates well with the critical realist approach for the following reasons: Firstly, the cases reflect actual mechanisms and processes; they are not simply observations. Secondly, casing is an iterative process always open to refinement and revision, including even major shifts during the process of casing. Thirdly, the phenomena are complex, contingent, and context specific.

Furthermore, Ragin (2009) stresses what he calls negative cases. Casing may be approached through the lens of outcomes versus population. In the first case, the phenomenon is studied by focussing on the outcomes of cases, which are similar, whereas the orientation towards the population may contain both positive and negative cases; that is, cases are included regardless of whether the outcome of a case has occurred. Multiple casing may be applied in a single case setting as well.

In this research, the single case contains embedded cases, that is, internationalising edtech startups. Startups in the accelerator include both startups that have entered foreign markets and startups that are exploring and developing international opportunities. In line with critical realism, this study aims to explain the development of international opportunities and the role of accelerator networks. Therefore, the question ‘What is a case?’ is indeed critical. The case would have been formed differently if the focus were on the successful exploitation of international opportunities.

#### 4.2.2 Abductive approach and critical realism

The abductive approach of the research process was illustrated in Figure 1 in the first chapter, highlighting the constant interplay of literature search, methodology, and empirical findings. As Van Maanen, Sørensen, and Mitchell (2007) argue, ‘abduction assigns primacy to the empirical world, but in the service of theorizing’.

According to abductive logics researchers search for exceptions and surprises, and the focus is on details and explanations are dynamic; all of which go well with critical realism (Ryan et al, 2012). Dubois and Gadde (2002) developed an application of the abductive approach with their introduction of a systematic combining framework and this design helps the researcher to see and understand more than just the aspects (s)he is looking for and thus, is suitable research design for a critical realist study.



Dubois and Gadde (2002) inspire the approach of this research. In their highly cited article, they made explicit a tacit process of abductive case studies. In fact, the high level of scholarly interest in the paper shows that they succeeded in illuminating the intertwined processes between theory, methodology, and findings, whereas the presentation of research usually strictly distinguishes between these elements. The paper elaborates the characteristics of analysis in case studies. The authors use the concept of systematic combining, a process of the simultaneous evolution of a theoretical framework, empirical fieldwork, and case analysis. The two key processes in systematic combining are, firstly, matching theory and reality and, secondly, continuous directing and re-directing, as illustrated in Figure 8 (Dubois & Gadde, 2002, p.555). The criticism of abduction stems from it not being transparent, and its flexibility is sometimes wrongly considered to signal an anything-goes approach. The role of abductive researchers is to clearly communicate their own positions and reflect upon them. Twelve years following above publication, the same authors (Dubois & Gadde, 2014) underlined the character of systematic combining as an iterative, non-linear research approach, distinguishing linear deductive research approaches from abductive approaches.

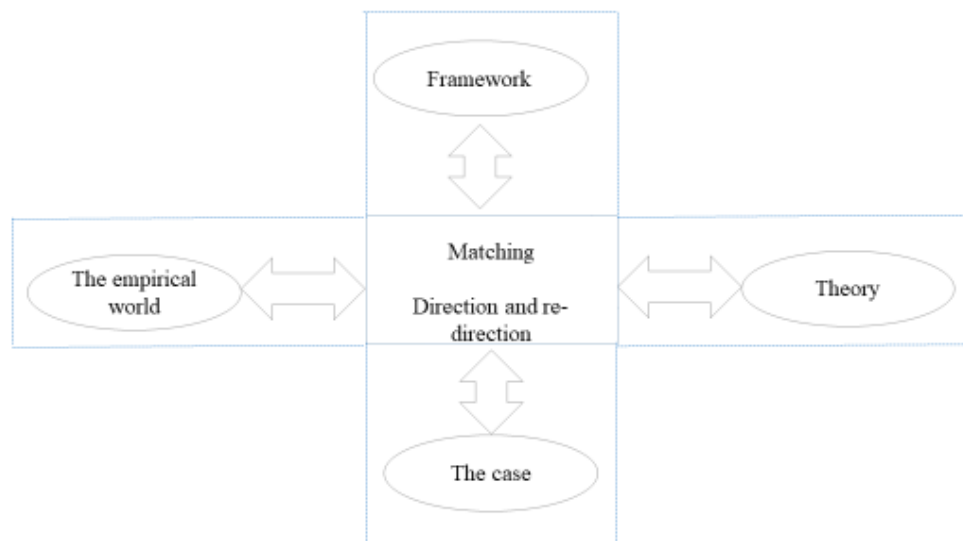


Figure 8 Systematic combining (Dubois & Gadde, 2002, p.555).

With respect to systematic combining, setting the boundaries of the case study is central, since in the social sciences, there are no natural boundaries (Dubois & Gadde,



The first phase of inquiry started with a review of literature on the SME and entrepreneurial internationalisation – that is, with a wider scope than only the internationalisation of new and emerging ventures. In addition, venture creation with incubators and accelerators as support mechanisms was studied. The lack of in-depth knowledge regarding the role of accelerators in the early internationalisation was identified, leading to the main research question. I familiarised myself with the research context by browsing research reports, statistical information, newspaper articles, and web sites, as well as social media sites linked with edtech. During the first phase, I went to the field and began observations. During that phase, I created interview questions and started interviews with one of the accelerator managers and startups.

Interviews were transcribed only by me, and they served as the first round of analysis. In the very early stages, I also created summarising tables and figures and wrote short memos of the startups after having transcribed the interviews. The interviews suggested that the ecosystem perspective was prominent among interviewees and in the literature on accelerators. The literature review regarding internationalisation also targeted the network viewpoint. I continued the interviews and further observations after the full-time field-research period. It became evident that interviewing only startups and accelerator management would not be sufficient to gain a holistic understanding of accelerator networks. I therefore started interviews with the partner network members and continued with later cohorts of the accelerator and accelerator managers. The initial coding categories were created based on the interview questions. However, quite soon it seemed more important to categorise findings based on the data, and accordingly, I started to create codes inductively.

Having completed the above-mentioned round of coding, themes started to emerge. In fact, the role of coding is controversial. Coding is also a simplistic way to conduct a qualitative analysis. It may be the first stage of the data analysis, as Silverman (2010) argues. Similarly, Coffey and Atkinson (1996) point out the coding may be part of the process of analysis, but it should not be thought as the analysis itself. The problems related to coding have to do with the decontextualising the empirical material, as Alvesson and Gabriel (2013) claim. Maxwell (2012), in turn, distinguishes between categorising strategies (coding), where the risk is stripping the context, and connecting strategies, where the researcher identifies key relationships that tie data together. In this research, coding was a step in an analysis method called the ‘constant comparative

method' (CCM), which consists of several rounds of comparisons within, between, and across data sources. During those steps in the analysis, the researcher ensures the contextualised viewpoint remains, even though the categories of codes have been created.

The actors in the accelerator partner networks were identified and compared with the existing literature, yielding some differences and novel information. The themes also showed mechanisms through which startups leverage accelerator networks in order to develop their international opportunities. Furthermore, the literature review was completed, this time focussing on network embeddedness, which seemed to be an appropriate theoretical lens for the study and basis for the analytical coding, in addition to the international opportunities. During this round, the sector context was researched and analysed as well, using the secondary data.

One aspect of abductive theorisation includes constant encounters with the scientific community when presenting at conferences and colloquia, sharing work-in-progress papers, talking to experienced scholars (Timmermans & Tavory, 2012). During this research, I presented in several academic conferences (see Appendix 4) and received valuable feedback in different stages of research to further develop ideas conceptually, improving the transparency of the analysis and the clarity of the findings. The final focus on accelerator networks as an embedding mechanism resulted, for instance, from re-visiting the research based on feedback from earlier versions (Kairikko & Dhaliwal, 2019).

### 4.3 Research design

This study addresses the development of international opportunities and the role of accelerator networks. The edtech sector is justified as a setting for a critical case as described earlier. The research design of an in-depth, qualitative case study was intended to examine the phenomenon – early internationalisation of edtech startups – holistically, in a real-life context (Flyvbjerg, 2006). In the previous section, the whole abductive approach of this research was explained, and in the following, the details of the data collection and analysis are discussed. The research design aligns with above-

mentioned principles of single-case study with embedded cases and an abductive approach.

#### 4.3.1 Selection of the research site

The research site is an edtech accelerator in the Finnish context. The selection of the research site was triggered by the paradox that I had observed at distance, as a lecturer in the higher education. There seemed to be no success stories of exports of education despite the very good reputation of Finnish education. Educational exports comprise a broad area. On one hand, it covers the area of edtech, emerging within exports of education dominated yet by small and new ventures; on the other hand, it covers exports of educational programmes run by educational institutions as a side activity to their domestic offerings. Edtech refers to the implementation of appropriate tools, techniques, or processes that facilitate the application of senses, memory, and cognition to enhance teaching practices and improve learning outcomes (Aziz, 2010).

This research has an entrepreneurial focus and, therefore, investigates startup ventures; the emerging area of edtech was a natural choice. Parallel to the contextual interest, even though the international new venture and born global literature widely cover early entrepreneurial internationalisation, relatively little real time research has been done on the companies while they are in the simultaneous process of venture creation and entry or growth in foreign markets. The literature review also clarified that accelerators are new actors having been studied little overall, with almost no research in the context of early internationalisation.

Parallel to the early steps of this research, a sector-specific edtech accelerator was founded in 2015, and its first batch of startups started in spring 2016. I started to follow the accelerator 2016 as a researcher and contacted the programme director in September 2016; I introduced the idea of studying the early internationalisation of the startups as a part of my PhD research.

The accelerator management welcomed the research initiative. I agreed with management that I would have access to the accelerator as an independent researcher. The accelerator management introduced me to the community of startups in the accelerator, which helped me to make interview arrangements.

The accelerator clearly defines itself as an ecosystem builder, and the very first steps in data collection were to define the range of key actors in the accelerator networks. The

research design was emergent and followed theoretical sampling (Gibbert & Ruigrok, 2010); that is, the data collection evolved during the field period, and I made decisions regarding subsequent interviews alongside the increasing understanding of the phenomenon. Figure 10 illustrates the identified partner networks in the accelerator.

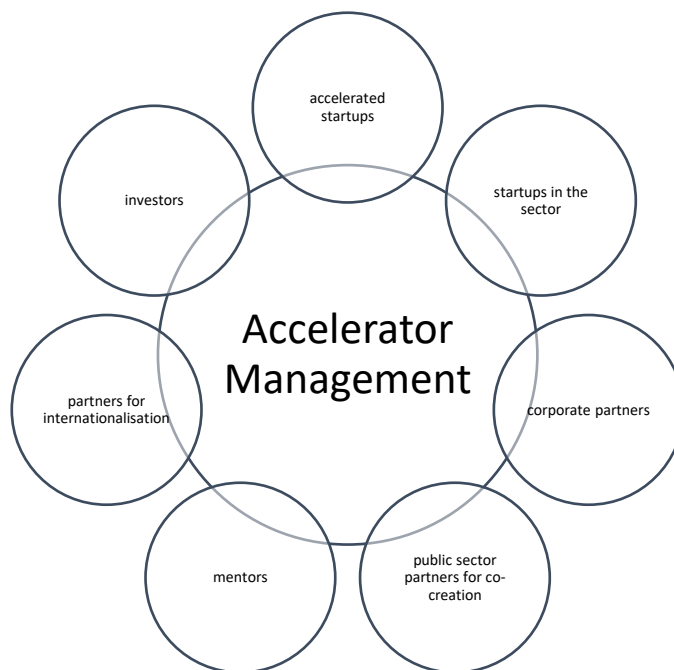


Figure 10 Key actors in the Finnish edtech accelerator ecosystem.

The units of analysis were the startups that had participated in the accelerator program. Opportunity development was studied from their perspective, however, by including the viewpoints from the above-illustrated key partners and stakeholders.

#### 4.3.2 Data collection

Following the case study strategy (Piekkari et al., 2009), the empirical inquiry included a variety of sources such as interviews, observations, and documents. The very strength of the case study research is its flexibility, and mistakenly, case studies are sometimes seen as identical with qualitative semi-structured interview studies (Easton, 2010). My study utilised a wide variety of data and aimed to maintain flexibility throughout the data collection.

In order to be close to real-life situations, I decided to start the data collection by spending eight weeks during March–May 2017 in the accelerator. During the intensive fieldwork, I observed the activities of the accelerator and the startups. I also started the

interviews while I was in the accelerator on a daily basis and continued them with later batches to collect data longitudinally.

Active and systematic data collection consisting of interviews (46) and observations (>50 different occasions both in the premises of the accelerator and outside the accelerator) took place from 2017 to 2018 (see Table 10). Various types of documents were included in the material, such as statistics and feedback from surveys, newsletters, and newspaper articles, as well as social media posts covering events in the accelerator during the years 2016–2019.

In line with abductive approach, it was clear from the beginning that re-directions would occur during the research process. The identification of the partners became essential early in the process. The interviews from several stakeholders enabled a holistic picture, which is in line with a single case strategy. Thus, I conducted interviews among various groups, as detailed in Table 10. The table highlights the key features of the implementation of interviews and observations. The documents were used as additional sources of information.

Table 10 Summary of the Interviews and Observation Data

	Observations	Interviews
Purpose	Stay close to real-life situations, naturally occurring data, feeding the interview discussions, holistic understanding of the research setting	All key groups relevant to the research and discovered during the observation period
Number and types of observation points/interviews during the time period	51 observation points **** February 2017–December 2018 an observation point in this context is an event lasting min. 1 hour and max. 1 day	46 interviews consisting of accelerator management (5) *, network partners (10) **, and startup entrepreneurs (31) *** April 2017–April 2018
Duration	One hour to one day	Average 51 minutes varying from 23 minutes to 85 minutes
Venue	Accelerator (46) exhibition centre (2) city hall (1) event forum in a shopping mall (1) old student house (1)	Accelerator premises (22), Skype (12), interviewee's office (7), public spaces (hotel lobby, café, restaurant) (4), interviewee's home (1)
Language	English and Finnish	Finnish (36) and English (10)
Documentation	Notes and reflective diary describing, analysing, reflecting	Recorded and transcribed verbatim

\* Interviewees CEO, programme director, marketing manager, community manager and head of internationalisation.

\*\*Total number of partner network interviews is 10 (education/municipality: 2, internationalisation: 2, investors: 3, mentors: 3, coaches: 2, corporate partner: 1); an interviewee identified as partner may represent several roles, such as, investor-mentor

\*\*\* 31 entrepreneurs in 28 accelerated and 2 non-accelerated edtech ventures.

\*\*\*\* Type of observations: Accelerator trainings (6), pitching events (3), international delegates visiting the accelerator (4), informal discussions when accelerator used as working space (18), social events (2), education fairs (2), startup events (2), visitor in accelerator (1), follow-up visits (13)

The following timeline (Figure 11) highlights the actual process of accelerator cohorts and the data-collection process in relation to time. Firstly, the data collection was longitudinal at the accelerator level and followed the early development of the accelerator through interviews, observations, and documents among alumni startups representing batches I–IV. Insights regarding later batches V–VI were gained through observations and documents. The startup interviews took place 3–12 months after the programme ended, meaning that when cohorts I–II startups were interviewed, cohort III was running.

I followed the later events of interviewed startups through publicly available sources of information. However, this research is not orientated to the outcomes of single startups at later stages, and it does not answer the question, ‘What happened to them



subsequently’ but rather views the impact of embeddedness in accelerator networks in terms of all startups.

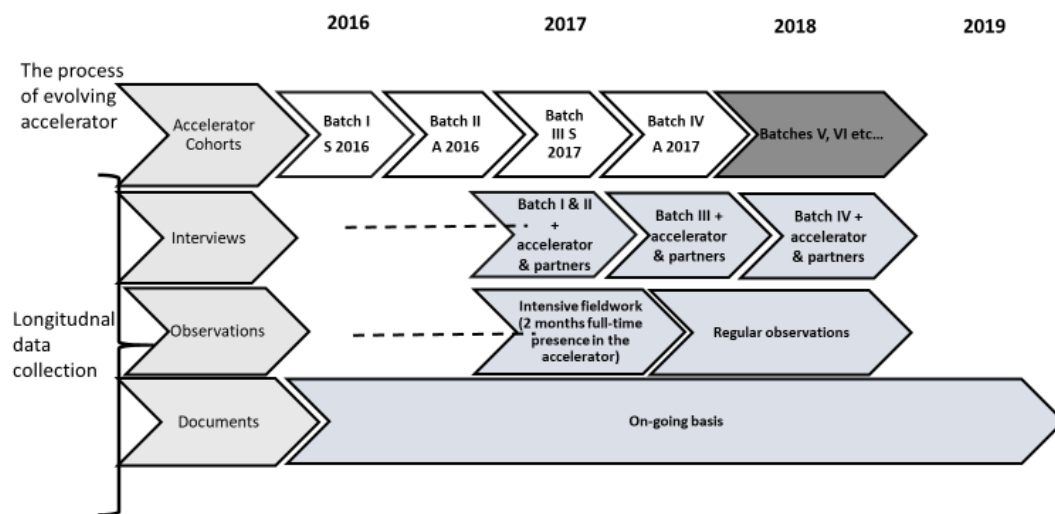


Figure 11 The actual process of evolving an accelerator and empirical process of data collection in relation to the timeline.

(S = Spring; A = Autumn)

### Interviews

The interviews were semi-structured. The outline consisted of main topics and issues, but the wording and sequence differed from interview to interview, according to the basic idea of semi-structured interviews (Eriksson & Kovalainen, 2008). The questions were also slightly modified for different groups of informants. The main topics were related to edtech as an industry sector, the internationalisation of startups, and experiences from the accelerator. The interview themes and interview questions regarding different groups (startups, accelerator management, public sector, mentors, investors, partners for internationalisation, other startups in the industry, corporate partners) are listed in the Appendix 1. Even though there was a semi-structured interview guide, the questions were not asked word-by-word if the interviewer noticed the interviewee had already covered the information related to later questions.

As an interviewer, I aimed to create an atmosphere in which the interviewees would find it comfortable to speak about their experiences regarding the accelerator. In order to build trust and to be transparent, I always explained the purpose of the study at the

beginning of each interview and provided further information if necessary. In order to provide orientation towards the interview, I explained that the interview would consist of three main topics, as listed above. One of the interviewees wished to see the interview questions beforehand, and I emailed them in advance.

Moreover, I always tried to make sure the interview would take place in a silent environment such as in a meeting room. Sometimes, the circumstances did not allow for such a setting, and there was more noise: for example, if the interview was conducted in a café. Still, despite the disturbance in some of the interviews, I was able to transcribe all the recordings. I also always made sure that I, as interviewer, and each interviewee agreed on the time frame for the interview. Mostly, the interviewees had booked an hour for the meeting and after the small talk at the beginning and signing the consent form (Appendix 2), the actual interviews averaged about 50 minutes; that is, the total duration of the meeting was the agreed hour. Some interviewees did not mind the interview lasting longer, and sometimes all the questions were asked sooner and the interview finished. Some interviewees were very busy, and it was agreed the meeting would be done within 45 minutes. In those situations, I was mindful of time restrictions and skipped certain questions that were less relevant.

The informants of the interviews represent different viewpoints (see Table 10). The interviews with startup entrepreneurs covered ventures from four different accelerator cohorts (spring and autumn 2016 and 2017 cohorts). The startup entrepreneurs were interviewed 3–12 months after the programme ended, and the timing of the interviews was justified by the fact that internationalisation is planned to start after the programme end in the acceleration process. All the startups in the first four batches were contacted for an interview (see contact letters for interviews in Appendix 3), and 76% of them were interviewed. All cohorts were equally represented in the interview material.

Two additional edtech startups, which are close to the accelerator activities but have not gone through the programme, were interviewed as well. Regarding the accelerator, all the people working for the accelerator during the period of the interviews, 2017–2018, were interviewed. As to the partner networks, the observations and interviews highlighted key groups of partners, who were then included in the interview material. The initial plan for the data collection was updated several times, due to the emergent nature of data collection.

Some of the interviewees were approached while the observations were taking place. In those settings, I introduced myself and the purpose of the research and asked for permission to agree on interview time. Some of the interviewees were contacted by email or through LinkedIn (see Appendix 3).

I provided a research information sheet for the interviewees and asked for consent for an interview. The consent form was available in two languages (Appendix 2). The interviewees were told their responses would be dealt anonymously; only their roles would be indicated. The interviewees were asked for permission to record the interviews, and all the interviewees assented. The recorded interviews were transcribed verbatim by me. After the interviews were transcribed, and having double checked for clarity issues, I deleted all the recordings, as I had promised when the consent for recording was asked.

The interviews were conducted in two languages: Finnish and English as indicated in Table 10. Referring to the framework by Marschan-Piekkari and Reis (2004), the interviews covered all forms of interviewer–interviewee pairs in terms of linguistic advantage versus challenge (number of interviews in brackets): native speaker – native speaker (34), non-native-speaker – native speaker (6), native speaker – non-native speaker (2) and non-native speaker – non-native speaker (4). Awareness of linguistic challenges in cross-cultural interviews is important. The interview data of this research also shows variation in the complexity of the language, depending on the linguistic background. Yet, the interviewer and all interviewees are fluent in Finnish, English, or both, and the language of the interviews did not have any major impact on the interview situations.

Coding and analysing the data, I used only English while writing summarising memos and creating categories, themes, and patterns. The original word-by-word transcripts were kept in the original language, and the direct quotes were translated by me. The observation notes were written in Finnish and in English, and the documents were mostly in English.

#### *Observations and documents*

The observations served as another main method in this research, in addition to interviews. The most intensive period of observations was the beginning of the collection of field data. The role of the researcher in observations may vary from full immersion to outside observation. As Silverman (2013) argues, interviews are

manufactured data, whereas observations, for example, are naturally occurring data. In the business research, the latter may take place through working for the organisation or through other intensive involvement (Eriksson & Kovalainen, 2008). Evered and Louis (1981) distinguish the role of the researcher as that of either actor (inquiry from inside) or onlooker (inquiry from outside). Yet, according to them, the role of the researcher is positioned in a continuum, where the roles actor and onlooker represent poles. In this research, I was closer in some observation settings to the actor end of the continuum and in others to the onlooker end. Spradley (2016) discusses degree of involvement both *with* people and *in* the actions being observed using a five-level scale regarding type of participation: non-participant, passive, moderate, active, and complete. In this research, I moved between the roles of passive, moderate, and active, depending on the observed settings.

In terms of the observations, I stayed full-time in the accelerator for a period of eight weeks in spring 2017 and conducted regular follow-up visits on a monthly basis in 2017–2018. During my stay and follow-up visits in the accelerator, I had the opportunity not only for interviews but also for several informal discussions and observations. I was able to observe programme modules in the accelerator programme and various types of events. Table 11 details a list of observations.

Table 11 Overview of the Observation Data

Type of activities observed and the description of the type of event	Purpose for the research	Number of observation points*
<p>Accelerator trainings: Accelerator programme contained several modules of training</p> <p>I followed the module lean launch pad and pedagogical workshops during the cohort III.</p>	<p>Insights in terms of the programme contents, startups, solutions and dynamics in the cohorts</p>	6
<p>Pitching events: Startup cohorts pitch during the different stages of the programme for key stakeholder groups</p> <p>I followed cohort III and IV programme pitches.</p>	<p>Insights regarding the startups, solutions and reactions from the stakeholders</p>	3
<p>International delegates visiting accelerator: Accelerator received visits regularly</p> <p>I participated in four visits as an observer.</p>	<p>Insights regarding the visitor groups and the role of accelerator in hosting the groups, as well as the early internationalisation and networks related to it</p>	4
<p>Informal discussions: Accelerator as a working space and location for interviews</p> <p>During the fieldwork, I worked on the research in the open office and spent time as a member of the community.</p>	<p>Enabled the researcher to have several daily informal discussions and serendipitous encounters to gain in-depth understanding of the structures and actors in the accelerator environment and observe the activities</p> <p>Background for interviews</p>	18
<p>Social events: Provided a platform for informal networking and building team dynamics</p> <p>The researcher joined the summer party and one weekly gathering of the startups.</p>	<p>Insights to edtech startup community and interactions in it</p> <p>A chance for informal discussions</p>	2

Education fairs: Important events for edtech startups to meet teachers and school principals, serving startups the opportunity for match-making with co-creation partners and potential customers	Insights to activities with one key stakeholder group	2
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I joined two of these events.

Startup event Slush and edtech track	The holistic understanding of the edtech scene and meeting startups and network partners	2
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The edtech accelerator has initiated a side event, ‘xcited’, which takes place parallel to the main event and gathers together edtech startups, influencers, and investors.

Visitor group from local higher education institution: Staff from one campus of the local university of applied sciences attended a development day at the accelerator	Insights to interactions with accelerator, startups and educational institution	1
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I presented my preliminary research findings for the audience. Three startups were pitching, and there were workshops for lecturers of higher education to become acquainted with the solutions.

Follow-up visits to conduct interviews in the accelerator premises or meetings with accelerator staff	To update the latest news in the development of accelerator and startups	13
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After the intensive fieldwork period, I returned to the accelerator premises to conduct interviews and meet accelerator management

Total number of observation points		51
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\*the observation point equals an event lasting min. one hour and max. one day

The observations started by focussing on actions and verbal communication, that is, what happens in the accelerator and what does not happen. The observations were unstructured, since a structured observation form would have set the boundaries for observations. As Spradley (2016) argues, observations are initially descriptive; during the project they become more focussed and, finally, selective.

I also considered the ethics of observations (Saunders, Lewis, & Thornhill, 2009). In situations within smaller groups such as programme trainings, I introduced myself to the participants. Hence, my role in small group settings was made known to participants. Fairs and events took place also in other premises than the accelerator, such as in the Expo and Convention Centre. During the observations, I took notes and photos and wrote afterwards reflective summaries, which enabled me to interpret the observed events and interactions. The observations also fed the formal interviews. The numerous observation notes were later organised around the following framework: space, actors, activities, objects, events, goals, and feelings (Spradley, 2016).

The observations have certain limitations and advantages. As Eriksson and Kovalainen (2008) argue, observations are recorded as actions take place and, therefore, do not involve time delays which may change peoples' memories. On the other hand, the same authors further argue that observations do not cover the thoughts or motivations of the people observed. In this study, observations were combined with several informal discussions.

Documents were used as an additional source of information throughout data collection. The types of documents utilised at the beginning and during the desk research were general statistics and research materials related to the edtech sector. Once the data collection in the accelerator started, the documents provided by the accelerator – such as portfolio documents, statistics, and results on feedback surveys – were included in the material. In addition, accelerator newsletters, social media posts (Facebook group for alumni, LinkedIn posts, twitter messages), and articles published in the media were reviewed. As the interview stage started, information regarding startups, such as their web pages, articles in newspapers, and magazines were checked, as well as their social media posts. The amount of text and visual material was extensive. For the actual analysis, the following items were selected: reports and statistics provided by the accelerator (3), newsletter posts (66) from the accelerator, articles in the media (19), and

posts in the Facebook alumni group (264 posts + related responses). The selection was made based on the insight that different channels generated similar messages, and the final choice of analysed channels ensured variety in viewpoints, as they were channels for different purposes and target groups.

#### 4.3.3 Data analysis

As indicated in Figure 9, I started to analyse the data while the data collection was taking place. The interviews were transcribed verbatim, and summary memos and tables of interview insights had been created during transcription. The insights from this phase influenced the subsequent interviews and emerging codes. The phases of the research process following an abductive approach, and analyses are highlighted in Figure 9. Table 12 serves as a detailed description of the analysis. NVivo software was used to store, organise, and code the raw data and, thus, support the qualitative analysis (Woolf & Silver, 2017). The data was also analysed by creating summary tables and by manually merging different sources of data in addition to computer aided qualitative data analysis software.

The units of analysis were the startups that had participated in the accelerator programme. First, the relevant actors in the networks were identified. Studying embeddedness requires a thorough understanding of context, gained through analysis of secondary data and deepened through interviews and observations. The coding was completed in several rounds, the initial codes were based on interview topics derived from the literature; the codes were then created inductively from the data; finally, in line with abductive theorising, the process of analytical coding was run iteratively and in constant dialogue with the literature and the emerging codes and themes. In addition, summary tables and charts were created throughout the analysis. The evidence was gathered from multiple empirical sources, enabling analysis within and between sources of data.

The method of analysis was the constant comparative method. The technique of constant comparison has been used in entrepreneurial network studies (Anderson, Alistair, Park, & Jack, 2007; Jack & Anderson, 2002; Jack, Anderson, Drakopoulou



Dodd, & Moulton, 2015; Shaw, 1999), revealing it as a suitable method by which to analyse entrepreneurial networks.

According to Anderson and Jack (2015), it is aligned with analytic induction and discussed by several authors (e.g., Boeije, 2002; Dye, Schatz, Rosenberg, & Coleman, 2000; Timmermans & Tavory, 2012). However, there is no contradiction in conducting constant comparative analysis and following an abductive approach; that is, despite the routes in grounded theorising, CCM does allow a researcher to go into the field theoretically informed (Timmermans & Tavory, 2012).

The analysis may start with an overall question, 'What is going on here'? The emerging categories and concepts are iteratively reviewed and refined (Smith & McKeever, 2015). The technique allows flexibility and adaptability, and even though the drawback of the technique is that it is time-consuming, it is a powerful technique when one is looking for patterns, themes, continuities, and discontinuities in the data (Anderson & Jack, 2015).

The CCM technique can be applied in various ways. One study (Jack et al., 2015), which strongly influenced this one's analytic techniques, deals with evolving entrepreneurial networks and begins with a search of all data for patterns and themes, moving towards descriptive categories and then synthesising analytic categories. Boeije (2002), in turn, suggests general criteria and clear procedures to conduct analysis using constant comparative method when analysing interviews. The benefit of a clearly documented CCM approach is the increase of traceability and verification of the research findings. The generic criteria cover the data or activities of an analysis, the aim, the results, and the questions asked. His example of an analysis uses five different steps, starting within interview analysis.

There are also versatile ways to use CCM well suited for other types of qualitative data, such as observations and textual data (e.g., Onwuegbuzie, Leech, & Collins, 2012). This study used multiple sources of data. Based on the approaches mentioned above and using CCM as a method of analysis, this study synthesises the ideas of Boeije (2002), in terms of steps and criteria, and of Onwuegbuzie et al. (2012) in terms of integrating different types of data. As a result, Table 12 highlights the analysis of this study, considering its steps, criteria, and different data sources. It shows the dominance of the interviews in the middle of the process and the use of all possible data sources at the beginning and end. As has been indicated earlier, the data analysis started while the data

collection was still taking place, and therefore, the steps in the analysis partly overlap with the data collection.

Rigorous research requires transparency regarding the steps taken during the research journey and documenting and reporting carefully the flow of thoughts. Even though Table 12 presents the process as relatively linear and straightforward, the process of qualitative analysis is seldom neatly organised and linear. Between the steps and during the steps, there are thinking processes, and several side steps, which may not be as well documented as the steps taken in the process but have been, however, influential in the analytical process. One could ask, to what extent it is even possible to capture the richness and complexity of the qualitative data analysis completely, even if one is aware of the request to document carefully every step.

Critical realism as philosophical stance contains the idea of alternative explanatory scenarios. During the process of analysis in this research, I trialled different explanatory models that the documentation (Table 12) does not include, as they were excluded from this research. Without doubt, however, even those side steps have been necessary. Thus, even side steps play a significant role in the background, regarding the final analysis.

Table 12 The Steps in the Analysis using Constant Comparative Method

Type of comparison CCM method	Source of data	Activity in the analysis	Aim	Questions	Results
Step 1: Comparisons within the type of data-collection source	Interviews Observations Documents Research reports on edtech	Transcription + note-taking note-taking and reflective diary reading + note-taking reading + note-taking	Approach the data by the overall question, 'What is going on here'?	How is the accelerator? How is the field of edtech in Finland? How do startups explore, develop, and exploit international opportunities? Who are key partners and events startups mention from the accelerator time? What do they tell about pre- and post-accelerator time? Are there any contradictions? Is there anything surprising? Is the data source consistent?	Memos, tables, diagrams, and lists of ideas for categories, feeding further interviews
Step 2: Comparisons between the interviews	Interviews	1st round of coding	Systematically code and categorise the data by utilising prior knowledge from the literature and categories based on insights in the first round	The same content-related questions as above. How is the definition of a code? What are the boundaries of the code? Is there a need for creating new codes?	Initial descriptive codes in NVivo software and interviews coded in nodes
Step 3: Comparison between the interviews	Interviews	2nd round of coding (partially overlapping with the 1st round)	Systematically code and organise data and add inductively emerged new codes	Is there an existing code or is there a need to establish new code based on the data?	Initial codes and new inductive codes in NVivo software and interviews coded in nodes
Step 4: Comparisons between the interviews across different groups of interviewees	Interviews	Organise the data according to the sub-groups of interview informants	Look at the data from different points of view, i.e., according to the holistic approach of case studies	How do different key actors see the phenomenon and contextual characteristics?	Memos, tables, diagrams on the identified actors
Step 5: Comparisons between the	Interviews	Forming themes and patterns and merging codes and categories	Merging categories, selection of data, creating themes, and	How does accelerator enable startups to develop international opportunities? What higher-level categories can be created? Are	The first frameworks of analysis based on themed categories and

interviews within and across different types of interviewees; comparison between alternative overall categories and scenarios for patterns			identifying emerging patterns	there any patterns? What is included in a category? How is it defined? What is their relation to the literature? How do the actions of different partners show in these categories?	key actors; tables based on different scenarios
Step 6: Comparison within the interviews and between the interviews and emerging theoretical framework	Interviews	3rd round of coding	Selectively focus on categories and themes and based on dialogue between the selected data, theoretical framework, and emerging case, create analytical codes  With a focussed approach, go through the existing codes and interviews and synthesise analytically	How to combine analytically the network relationships that accelerator is enabling? How to combine local and international network embeddedness and different types of relationships supporting international opportunity development? How do these categories look at the startup level? How to include the startup character and the findings from the previous rounds of analysis?	The revised frameworks of analysis for accelerator networks as an embedding mechanism and startups using network embeddedness
Step 7: Comparisons between all types of data and between different groups	Interviews	Comparing the frameworks of analysis with all types of data by cross-checking the findings with all types of data	To refine the analysis and findings	How do other sources of data support the created frameworks of analysis? Is there anything contradictory? Is there anything essential missing?	Comparison of tables of data regarding observation notes and documents  Re-reading of all the materials with a comparative viewpoint to the analytical frames  Final analysis of relationships between different groups of actors  Re-visiting of the conceptual framework
	Observations				
	Documents				

#### 4.3.4 Evaluation criteria for the research

The ontological and epistemological basis of the study provides the principles for its methodological evaluation criteria (Eriksson & Kovalainen, 2008). The dominance of positivist studies easily leads one to judge research according to the typical positivist criteria: validity, reliability, objectivity, and generalisability. However, this approach is misleading, and each study needs an evaluation on its own terms. This research takes the form of a critical realist case study in which the underlying assumption is that reality exists independent of our perceptions and that divergent interpretations of it can coexist.

Easton (2010) draws on Sayer to discuss critical realism specifically in the context of case studies, stressing the following six features:

1. Critical realism is suitable for clearly bounded but complex phenomena such as organisations, inter-organisational relationships, and networks of organisations. The boundaries must be determined, yet they may change over the course of the study. It is less well suited to study, for example, individual behaviour.

Regarding the first point, this research aims to extend knowledge of the role of accelerator networks in internationalising startups. Referring to Lee and Jones (2008), studying networks match well the philosophical stance of critical realism. The phenomenon is complex, including inter-organisational networks of relationships. On the other hand, the accelerator sets the boundaries to the phenomenon. There are relatively clear contextual boundaries spatially and temporally addressing the character of contextual emphasis (Leca and Naccache, 2006).

2. The type of research question should be in the following form: What caused the events associated with the phenomenon to occur?

The research question addresses the cause and effect of accelerator networks and internationalising startups. Thus, the study is explanatory in nature. However, the study is not predictive, as are positivist studies, and the critical realist studies consider the world to be an open system with several coexisting causal powers (Bhaskar in Wynn & Williams, 2012).

3. Critical realists identify entities and objects that characterise a phenomenon.

Regarding the third point, the identification of the objects and entities started with literature review. When I went to the field, I had a pre-understanding of the phenomenon and the actors and concepts related to it. Nevertheless, the site period revealed actors who were less commonly mentioned in the literature and, consequently, mechanisms related to the phenomenon that explain the development of international opportunities.

4. Critical realists utilise the strength of their study's data collection, that is, its flexibility. The case-study data is not identical to that of semi-structured interviews.

The fourth point was also widely applied in this research. There were three different types of data: interviews, documents, and observations. The research plan was constantly updated to correspond with the increasing knowledge and understanding of the phenomenon. Flexibility was maintained by adding new informants when needed and by keeping contact with the research site and completing follow-up observations.

5. Retrodution is a key epistemological process in critical realism – that is, seeking an explanation and going back to the research.

As presented in Figure 9, the whole research process was abductive, and during the inquiry, I moved several times between the theory and empirical data. The iterative process of going back and forth between theory and data and setting the boundaries for the case have been in place throughout the process. The boundaries of the case study emerged during the empirical inquiry; that is, following to Ragin (2009), the process of casing took place.

6. Critical realism focusses on identification of mechanisms to explain the phenomenon.

Regarding the final point, the identification of mechanisms explaining the phenomena, which are empirically experienced, is one the key tenets of critical realism (Bhaskar, 2013). Following this thinking, I have been trying to explain the mechanisms that underlie the levels of actual events and empirical inquiry.

The critical realism is based on the idea that the world exists independently of people's conceptions of it, and interpretations of it may differ widely. I constantly reflected on the objectivity versus subjectivity, being an insider versus onlooker. However, in line

with the critical realist philosophy, if another researcher were to go through the same observations, documents, and interviews, that researcher might have ended up defining different mechanisms as an outcome of the study. One of the central tenets of critical realism is that several different mechanisms can explain the same phenomenon (Bhaskar, 2013).

Depending on viewpoint, a single case study can be a limitation or an asset, as discussed in Section 4.2.1. Nevertheless, it can provide rich in-depth insight of the development of international opportunities in an emerging sector. A study that is conducted in a naturalistic context requires the researcher to be part of the research setting, which, in turn, leads to a discussion of reflexivity.

#### 4.3.5 Reflexivity

Reflexivity is a key concept in qualitative research, meaning that the researcher is aware of her own role affecting both the process and the outcome of the research, as well as being aware of the mutual influence between researcher and research object (Haynes, 2012). Reflexivity includes the idea that the researcher must consider how the final ideas came to be. In other words, researchers recognize their own assumptions and how their ideas evolve as their understanding of the research topic increases.

Reflection and interpretation are embedded in reflexivity (Haynes, 2012). Relevant questions showing reflexivity are, for example, as follows. What is my motivation to undertake the research? What are the underlying assumptions I bring to the research? How does my theoretical, experiential, or emotional connection to the research affect my approach?

Throughout the process – research design, data collection, analysis, and interpretation and reporting – I reflected upon my choices, theoretical and practical, and my preconceptions. I started with the choice of context, the field of education, to which I have a prior connection due to my profession as a lecturer in higher education.

Choosing a context to which one has a prior connection imparts advantages and drawbacks. Chalmers and Shaw (2017) stress that a research context is not limited to natural settings but also encompasses questions such as ‘whose understanding of context, what aspects of context and how knowledge of context may be accessed by the researcher’.

We cannot decontextualise ourselves (Welter, Gartner, & Wright, 2016). Thus, being aware of the subjective view of context is crucial. We create the context through our construction and interpretation of it (Akman, 2000). For this study, this personal relationship to context meant that before I started systematically to study startups in this field, it was difficult to avoid being influenced by the narrative of Finnish education in international comparisons.

I strove to be a reflective researcher throughout the study. This effort started by reading articles dealing with the position of the researcher, to raise my awareness, and I continued to do so throughout the research. Hence, while designing the research, I had already begun to contemplate my own role in it and my relation to the field and context.

During the data collection, I also reflected after each interview upon the influence of my reactions to the interview flow. I tried to control my reactions and remain as neutral as possible. If the interviewee was saying something aligned with my preconceptions, I tried not to signal that this was the case. I tried to behave the same way as I would in a situation when the interviewee shared completely novel information with me. My observation was that the interviewees tended to consider me to have strong preconceptions, and during the interview they often remarked as follows: 'I do not know if this is what you were looking for'. In these settings I was always trying to assure the interviewee that whatever this person was saying is important to the study, and there were no correct or incorrect answers to any of the questions.

Referring to the point above, I also realised the strength of including naturally occurring data in the data collection. As Silverman (2010) argues, interviews are manufactured data, whereas for example, observations are naturally occurring data. Due to the nature of interviews as produced settings, including naturally occurring data was from the very beginning an essential element of the research design. However, its benefits became even clearer during the process of the research.

In practical terms, being a reflective researcher involved writing a reflective diary during the fieldwork. Discussions with colleagues or other researchers were helpful, as they enabled me to recognise certain preconceptions, which often show, for example, in choice of wording. Collegial discussions also contributed to a deeper understanding regarding the topic.



During the analysis, I tried to avoid the trap of emphasising points from the voluminous material that would only strengthen my preconceptions. I went through empirical materials with a genuinely open mind, line by line and multiple times, to distance myself from the environment and approach it from different angles. The chosen tool for analysis supported this. The repetitive rounds of data review were important, since at first glance, I could recognise points that strengthened my preconceptions. Only with the emergence of the case and increasing understanding of the research object, did I capture the richness of the data. In other words, what might have seemed neutral or less important became a key finding as the analysis evolved. I also realised how important it was to pause when analysing the data, approaching it again after a while. The same applies for the reporting stage of the research, during which I realised how important it is to distance oneself from the text.

Qualitative research is an endeavour that appears at a certain stage of the research very messy, due to the massive amount of data. The attempts to achieve clarity require selection and organisation of the data. A reflective researcher must be aware of biases when collecting, sorting, selecting, and analysing data. However, following the critical realist paradigm, this research acknowledges a number of interpretations of the same reality and alternatives regarding the explanatory mechanisms; therefore, another researcher may have drawn different conclusions from the data at hand. The co-existence of different views allows several interpretations leading to different explanations of the same phenomenon, which are, however, complementary rather than contradictory.

## 5. Data analysis and findings

This study set out to extend knowledge of the role of accelerator networks for internationalising startups in the edtech context. The context of Finnish edtech, specifically, was chosen, due to the following unexpected contrast: international reputation of the Finnish education versus modest results of this sector in the export markets.

Despite the fact that according to several international comparisons the quality of Finnish education is high<sup>5</sup> – and despite positive international media attention for Finnish education profiling the country by expressions like, for example, ‘education superpower’<sup>6</sup> – exports of Finnish educational products amounted only approximately €250 million in 2017 (Kauppalehti, 2017). That figure covers both export of education as well as export of edtech, although only the latter is within the scope of this study.

During the abductive inquiry described in the methodology chapter (Figure 9), there was constant dialogue between the theory and empirical data contributing to the final

5

Study	Educational dimension	Position of Finland
World Economic Forum Global competitiveness Index 2015–2016	Primary education and health Higher education and training	1st rank (140 countries) 2nd rank (140 countries)
PISA Program for International Student Assessment 2015	Science Reading Mathematics	3rd rank (34 OECD countries); 5th rank (73 countries) 2nd rank (34 OECD countries); 4th rank (73 countries) 7th rank (34 OECD countries); 13th rank (73 countries)
Learning Curve Index 2014	Combines national data and a number of international rankings - including PISA, TIMSS and PIRLS	5th rank (40 countries)
OECD Well-Being Index, dimension of education	The education attainment (adults aged 25–64 have completed upper secondary education)	87% (OECD average 76%)
Legatum Prosperity Index, sub-index education	Education (sub-index ranks countries on the access of education, quality of education, and human capital)	1st rank (149 countries)

<sup>5</sup> BBC News (2016, October 27). Why do Finnish pupils succeed with less homework? Business Insider (2011, December 14). 26 Amazing Facts about Finland's Unorthodox Education System. Independent. (2015, March 20). Finland schools: Subjects scrapped and replaced with ‘topics’ as country reforms its education system. The Guardian (2015, March 31). Q: What makes Finnish teachers so special? A: It's not brains. The Guardian (2015, June 17). Highly trained, respected and free: why Finland's teachers are different. The Hechinger Report. (2016, February 18). How Finland broke every rule — and created a top school system. The Huffington Post. (2016, April 8). Three lessons from Finland's education system.

case and framework. The analysis involved constant comparison within and between different sources of data, and the steps in the analysis are explained in the Table 12. The outline of the chapter is as follows. Section 5.1 focusses on the emerging Finnish edtech accelerator to provide thick description and contextualise the phenomenon under study. The accelerator is called in this dissertation ‘The edtech accelerator’, which is not the formal name of it. The sub-sections of 5.1 follow the structure of the literature review; that is, they cover the discussion of the definition of an accelerator, the startups in the accelerator, and the accelerator networks. Section 5.2 analyses the findings, explaining the development of international opportunities through accelerator networks. Thereafter, in Section 5.3 the analysis concentrates on the classification of the internationalising startups. Finally, Section 5.4 closes this chapter by revisiting the conceptual framework and drawing together findings related to the sub-questions of this research.

An in-depth understanding of the context is crucial when aiming to understand embeddedness. Gaining an in-depth understanding through thick description is also the strength of the case study. In order to illustrate the analysis and benefit from the rich data of a qualitative study, this chapter includes an extensive number of citations from interviewees. The study has eight different types of informants as discussed in the methodology chapter: startups (accelerated and non-accelerated), accelerator management, education and co-creation partners, partners for internationalisation, mentors, investors, corporate partners, and coaches. The interviewees were given running numbering (Interviewee 1, 2 etc.). To ensure integrity of responses, informants were promised their responses would be treated anonymously. By guaranteeing anonymity, they would feel more comfortable speaking about their experiences and even expressing critical voices. Hence, individual viewpoints are not recognisable in this research; citations indicate the sub-group of interviewees and the general numbering logic mentioned above is applied to all interviews (e.g., accelerator manager, Interviewee 1; startup entrepreneur, Interviewee 2). More-specific information (e.g., naming the cohort) would lead to more recognisable references. The choice to indicate citations at the level of informant group may also be justified by the fact that, for example, the cohort or any other more-specific indicator is not crucial in answering the research questions.

## 5.1 The emerging edtech accelerator in the Finnish context

I see their role [the accelerator] as a bridge builder. This is like a hub. This industry, if we consider Finnish edtech as such, in order to emerge and flourish, it needs to have a profile and that requires hubs like this.

Startup entrepreneur (Interviewee 39)

### *Temporal and spatial context*

The edtech accelerator was founded 2015, and the first cohort started the following year. Considering the temporal and spatial context, the birth of the accelerator is situated in a time period that has been characterised by lively discussion of startups and high-growth companies, along with the importance of startups in economic renewal. The startup boom in Finland has manifested itself, for example, in the emergence of both private and public incubators and accelerators as well as in other startup-support services.

Moreover, the steady growth of investment in startups has been an indicator of increasing interest in startups. The sum of foreign investments in local startups increased almost fifteenfold from 2010–2018 (Finnish Venture Capital Association, 2019). Furthermore, Finland has received more attention in regional comparisons around the globe. The greater area of Helsinki is ranked at top in the dimension ‘local connectedness’ among the startup ecosystems globally (Startup Genome, 2018). This ‘local connectedness’ refers to sense of community.

The growing publicity and interest in startups have also been fostered through movements by volunteers and students to create entrepreneurial societies and events for startups, such as the event Slush,<sup>7</sup> which started first as a small initiative run by volunteers, mainly students and startup enthusiasts. Within 10 years, Slush has become one of the major startup events in Europe, gathering together increasing number of investors and startup entrepreneurs, and it achieves extensive media coverage each year.

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<sup>7</sup> Slush events 2018 in numbers:

	Attendees	Startups	Investors	Journalists
Helsinki	20000	3100	1800	650
Tokyo	5000	500	200	250
Shanghai	3000	300	250	80
Singapore	3000	360	250	120

Source: Slush web page [www.slush.org](http://www.slush.org)

The event has also spread globally through regional events. Slush and other smaller pitching events have substantially changed the landscape of Finnish startups since 2010.

The birth of the edtech accelerator occurred during a period characterised by the rapid evolution of the Finnish startup ecosystem. As to the field of edtech, in turn, business opportunities started to emerge to create learning solutions that would correspond to the changes in education and enhance the acquisition of 21st-century competences.

Learning solutions in this research refer to products whose main purpose is to enhance learning (Tekes, 2015).

### *Birth of the edtech accelerator*

The edtech accelerator was established in Helsinki, Finland, as a privately funded accelerator focussing on transformative learning solutions in the education sector. The edtech accelerator found an ideal location in the campus area of Helsinki University next to the Faculty of Educational Sciences in a classic building with old furniture and interiors, contrasting the activities of technology startups. The location next to the Faculty of Educational Sciences of University of Helsinki is an advantage; the edtech accelerator is close to the physical premises where teachers are educated and educational research is conducted.

The location supports the strategic focus of the accelerator: to attract promising startups globally to be accelerated within the Finnish ecosystem and to leverage the Finnish pedagogical reputation. Thus, the idea was from the very beginning to accelerate Finnish startups to meet the needs of international markets but also to host startups from different parts of the world and support their efforts to become international and global. Correspondingly, the accelerated startups in this study are of local and non-local origin. The accelerator journey is designed to lead to investment opportunities and opportunities in the foreign market.

A group of private investors and corporate sponsors enabled the accelerator to be initiated. The accelerator initially had only two people running it: the CEO responsible for partnerships and the programme director responsible for cohorts, programmes, and ecosystem development. Both of them had personally seen the difficulties for edtech startups during their earlier careers. The CEO had a long corporate career in the technology sector. In addition, he had been an entrepreneur with an educational focus. With this background, he had become familiar with the accelerators and seen, how, for

example, the gaming industry<sup>8</sup> enjoyed a strong and supportive community, which was completely lacking in the area of edtech. The programme director, in turn, had experience with the exports of education as well as from an educational startup. Thus, he had seen the difficulties firms face while internationalising.

### *Removing domestic bottlenecks*

Having identified these ‘pains’ for educational ventures, they had a clear vision of how to start tackling the challenges. In addition to regular accelerator activities – such as creating a solid network of coaches and mentors, technological corporate partners, and investors – they realised it was also critical to have partners from the education sector to leverage the Finnish know-how in education and to co-create with Finnish schools. The accelerator management identified the lack of local customer references as a bottleneck. Consequently, to demonstrate that the solutions add value, the companies would need reference from home market customers. Startups would also need opportunities to develop their products; the area of education, at least Finland’s public education, requires agreements between small private firms and public sector partners to enable these actors to collaborate. There was, however, no existing model for collaboration, even though the schools were increasingly receiving requests from startups to co-create. The challenge of enabling collaboration was also identified in Espoo, the second largest city in Finland, located next to the capital city Helsinki. The head of a local department of education and culture was aware of a growing number of collaboration requests from small companies and, personally, had a positive attitude towards the idea of a living lab where actors from the surrounding environment – such as entrepreneurs with their innovative digital solutions – may test and develop their products. Yet, the lack of instructive principles on how to collaborate at the public–private interface hindered the collaboration.

Thus, a systematic approach was needed. In this setting, the accelerator acted as a trigger between the city of Espoo and edtech entrepreneurs, and Espoo took the

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<sup>8</sup> The Finnish gaming industry that has grown to over €2 billion industry (2018) in comparison to the figures of €87 million only a decade ago (Neogames Finland ry, 2019).

initiative to design a model called KYKY<sup>9</sup> for collaboration between startups and schools:

The idea of the accelerator was something I was in favour of, and it was actually thanks to the accelerator that we had pressure to find out how to solve the situation.

Representative from the municipality (Interviewee 33)

The role of the accelerator was to initiate and speed the process of creating a systematic approach to the collaboration between schools and startups, for which there was already demand. Once completed, the systematic approach started to benefit all Finnish edtech companies, not only the startups in the accelerator. From the schools' point of view, the co-creation and testing enhanced the digital transformation at schools while offering teachers and students access to the latest edtech products. Participating in the KYKY process does not necessarily lead to sales; however, it is an option in the later stages. In addition to the city of Espoo, arrangements for living labs also emerged with other public sector partners, such as the city of Helsinki or Heureka, the Finnish Science Centre.

### *Going international*

In order to foster international opportunities, a network of international partners was necessary. The accelerator management started to work on partnerships with organisations similar to themselves to enable startups to smoothly move to foreign markets after the completion of the accelerator programme. The first foreign contracts included an education accelerator in Silicon Valley, an industry association in Sweden, and a testing platform in Hong Kong, with an extensive network of schools, followed by international schools in Qatar and in Singapore. After the accelerator programme, the startups had the opportunity to enter the named markets. Later, the international networks were expanded by, for example, the global accelerator network (GAN) and with the UN technology innovation lab. The edtech accelerator was the first accelerator from Finland to be selected in GAN.

Regarding the Asian market, the collaboration started in its very early stages with a British–Finnish venture, where the partner had become convinced of the opportunities offered by the innovativeness of Finnish education. He started to support selected

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<sup>9</sup> KYKY Living Lab means the school community develops products and services to support learning and growth with companies and communities. The co-operation is based on a development need recognized by the school (source: KYKY web page <https://www.oppimisenuusiaika.fi/the-new-era-of-learning/>)

startups in the Asian market and bring teachers regularly from Hong Kong to Finland to acquaint them with the Finnish teaching and learning environment:

I realized all the things that had been happening and were happening in the education system combined with the high level of knowledge of technology that was happening in Finland especially around mobiles, of course, and also added to that the success Finland was having around games. The gamification. Putting those three together – the pedagogy, the technology, and the gamification – the edtech became very interesting sector, and what I found was that there was nobody in Asia helping Finnish companies scale their businesses in Asia in the edtech scene. So, I set up a company with a Finnish partner in Hong Kong.

Partner for internationalisation (Interviewee 21)

In terms of internationalisation, parallel to the initiatives that the accelerator was taking, there were governmental programmes to enhance exports of education that had been taking place before the accelerator was founded. A startup was also founded to integrate several aspects of Finnish education and export a whole concept of a Finnish school containing solutions, expertise, and even physical elements. Some of the accelerated startups have also been developing international opportunities with the actors mentioned above.

From the beginning, it was evident that the accelerator selects only startups with scalable business models, targeting international or global markets. This choice excludes companies which might have a good concept and good potential to create sustainable business for the founder(s) of these companies. Due to the accelerator business model, where the accelerator takes a stake in the accelerated companies, the growth orientation is key for selection to the programme:

Since our business model is an accelerator business model, we seek growth-oriented ventures, and then startups with scalable business models are the ones we are looking for. And for that reason, some drop out in the selection, even good ones, the ones that do not scale even if the business model might work well for that company and even if the company would benefit from the programme. It just simply does not match with our investment that our target is to have a small stake of the firm and that there would be success stories in terms of growth.

Accelerator manager (Interviewee 30)

The network of mentors and investors was international from the beginning, and the global orientation also shows in the communication. The language in all the communication of the accelerator is English, which is often the case in communication within the ventures as well. Considering the organisational formation, the startups developing international opportunities incorporate the international aspects in their daily



practices, and their backgrounds very much resonate with the research findings from born global literature, which identifies the founders are internationally experienced:

English has been our company language from the beginning because our product manager is Chinese and one of the developers is non-Finnish.

Startup entrepreneur (Interviewee 29)

### *Characteristics of edtech*

The accelerator also found crucial that the startups would be able to articulate the pedagogical impact in their learning solutions. Regarding the characteristics of edtech, the opportunities in the education technology and learning solutions are based on the 21st-century paradigm shift in learning and simultaneous advances in technology. Increasing interest and opportunities in the area of edtech are linked with the transformation in education that is taking place due to digitalisation and globalisation, and they have already changed the ways people acquire knowledge and disrupted most industries, as highlighted by various studies (Dumont & Istance, 2010; PIAAC Expert Group in Problem Solving in Technology-Rich Environments, 2009). The World Economic Forum (2017) estimates that 65% of present primary school children will work in occupations that do not exist today, challenging educational systems to renew themselves and to apply new methods. Still, according to Schleicher (2015, p.61), ‘innovation in education is not just a matter of putting more technology into more classrooms; it is about changing approaches to teaching’. In a similar vein, different stakeholders in the edtech industry share the viewpoint that a successful learning solution is a combination of the following three elements: business, technology, and pedagogy:

You need to understand business, technology and pedagogy and then understand how to create a concept, a service that is balanced.

Corporate partner (Interviewee 20)

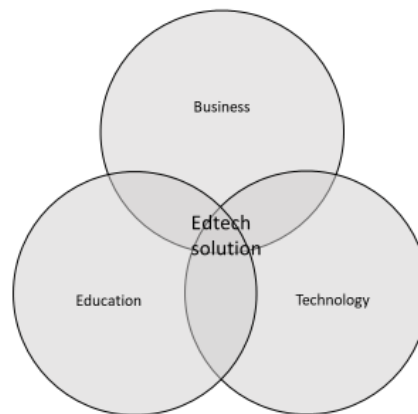


Figure 12 Key elements of edtech companies and learning solutions.

The journey of acceleration consists of the following training modules: business development, marketing and sales, technical acceleration, leadership and management, pitching and communication, design thinking, team building, pedagogy and co-creation with schools, capital boost, and finally, international market expansion. The modules are in line with the accelerator literature (Pauwels et al., 2016), apart from co-creation and pedagogy, which is a sector-driven specialty of the edtech accelerator. The pedagogy part is related to the specific industry sector and the Finnish environment; given the international comparisons, the emphasis on pedagogy is also unique for the accelerator. It stems from the strengths of the Finnish teaching environment:

Here teachers are happy to listen and co-create. Therefore, the accelerator has a huge unique opportunity. Pedagogy is missing in the most places. Technology and business drive forward edtech products so this pedagogy aspect is unique to Finland and unique to accelerator.

Partner for internationalisation (Interviewee 21)

The importance of stressing the social impact is another characteristic routed to edtech. Many ventures in the edtech accelerator are motivated and driven by the motto ‘working for a greater cause’; they genuinely want to change the world through education, at the same time creating profitable businesses. Social impact workshops were included in the programme, to support startups in crystallising their profiles as social impact companies. The workshops foster startups’ ability to articulate their social impact for

investors using metrics of impact. Startups are advised to focus on investors who would understand and appreciate that edtech is a slow industry:

Social impact investments mean basically that you collaborate with the target companies with the purpose that you may constantly measure how the products and services of these companies execute social impact measures. Examples of such measures in education are of course learning outcome as one the most important and well-being at schools and among teachers... then the efficiency in monetary terms and then then reducing bullying. There are many of these metrics that companies implement and we constantly measure and then we may conclude what is the impact of the invested money at the grass root level.

Investment partner (Interviewee 42)

### *Startup among startups*

How to acquire funding for an accelerator was a key question, and the funding structure of the accelerator is based on private funding consisting of corporate sponsors and private investors. Sponsors are an essential part of the accelerator. The accelerator takes a small percentage share of the equity of startups, and the programme does not include any fees. The Finnish edtech accelerator is itself a startup, a common situation among accelerators (Bliemel et al., 2016; Goswami et al., 2018; Pauwels et al., 2016). As a consequence, the accelerator is similarly going through iterative development with limited resources like the startup ventures they are hosting:

Well, it is the startup way of doing. The title on the business card says one thing and contact details on the email template another and then like it is in the startup world the actual role is much broader.

Accelerator manager (Interviewee 43)

Startups must be able to react quickly. Being a startup requires a flexible team. On the other hand, it is also a point of tension or criticism. The downside of being like a startup means that there is lack of coordination in the activities:

The point being here that accelerator is kind of like a startup and that they do similar mistakes as any startup.

Startup entrepreneur (Interviewee 27)

### *The growing community*

The first cohort started in spring 2016. The first cohort was a pilot programme and was implemented through trial and error. It took some rounds until the programme reached the level at which it was more or less replicated the way it was conducted for a previous cohort. The quality of the startups and competitive process in the selection (European Accelerator Summit, 2016) are critical for any accelerator. Table 13 presents key figures of first six cohorts (2016–2018), showing that the average number of applications was over 100 applications per cohort and that the average number of accelerated startups was eight per cohort.

Table 13 Key Figures of the Accelerator by the End of 2018

Number of programmes	6
Number of accelerated startups	56
Applicants for six first cohorts	600 +
Applicants from different countries	69
Startups still active	96%
Number of countries (startups)	11
Education partners	100 +
Female founders	46%

(Source: Accelerator newsletter 21.12.2018)

During the starting stage of the accelerator, the CEO and the programme manager did a great deal of personal marketing to attract interesting and potential startups to apply for the cohorts. By word-of-mouth, the message spread relatively quickly, and startups collaborating with corporate partners or other significant corporate stakeholders started to hear recommendations for the accelerator. In addition to the business relationships, the personal contacts of the startups, such as other entrepreneurs and even friends, comprised channels of information. Some of the startups were already involved in export promotion programmes run by public sector organisations, and the connection to the accelerator was established in that way. Events were also for many the gateway to access the accelerator: general startup events, pitching awards and edtech-related events such as exhibitions, including the major European edtech event Bett in London.

The accelerator also realised the importance of ensuring online visibility, and that was a dedicated task of the marketing manager, who started in the second year. Other new recruitments were a community manager and, later, a manager for internationalisation.

With changes in staff, the number of personnel has been on average 3–4 full time staff members in the early years of the accelerator's existence, accompanied by a wide and active network of coaches and mentors. By the end of 2018, the accelerator had 45 coaches and mentors listed on their web site. The sector specificity and the strong emphasis on pedagogy is exhibited in the profiles of the mentors that represent business and technology but also the field of education. The efforts to build up offline and online presence increased awareness of the accelerator, and the first success stories validated the position of the accelerator. There was a clear difference between the interviewees with the first cohorts, regarding the pilot programmes and being part of creating something novel, and the later cohorts, for whom the accelerator was already a well-known actor in the field:

This [accelerator] is known in the Finnish educational technology sector; I cannot quite clearly say how we heard about it. Probably from several sources, as it starts to be a well-known actor in the field.

Startup entrepreneur (Interviewee 37)

The premises of the accelerator create the physical meeting point for the community. The accelerator has meeting rooms for startups and alumni to arrange negotiations with their partners. Training facilities are available for the training sessions of the cohorts, smaller events and visitor groups. The accelerator hosts events for the cohorts and frequently receives foreign delegates. There have been frequent requests from abroad to visit the accelerator from the very beginning. The proximity to the University of Helsinki means synergies; for example, the accelerator receives regular foreign visitors such as teachers, principals, governmental decision-makers, and so forth:

We have foreign guests...delegates once a week.

Accelerator manager (Interviewee 25)

The accelerator managers inform the startup community about the visits and offer pitching opportunities for all alumni, but physical presence in the venue makes the attendance easier. Some of the startups have rented small offices in the building in which the accelerator is located. When startups recruit more employees and grow, they move to other premises, and there is rotation in the building. The in-house offices are reminiscent of the incubators and co-working spaces and indicate that the characteristics of startup-support mechanisms overlap (Cohen & Hochberg, 2014).

The accelerator also soon realised they have to take an active role in enhancing collaboration among startups and start building up an international community of alumni. A strong peer community is an asset itself, and the more successes, the better for the accelerator. The accelerator wants the startups to succeed, as they obtain a small percentage stake of ownership in accelerated startups:

Now that we are not anymore in the programme, it seems they are as active as they used to be. Pushing us forward, and it is the way it should be.

Startup entrepreneur (Interviewee 7)

The alumni network is maintained through publishing newsletters, sharing success stories, communicating in the social media, organising events, and inviting alumni startups to the accelerator whenever there is an event or gathering that could be useful. In addition, there are social events such as barbeque parties and Christmas parties. The newsletters cover more official news such as announcements of new partnerships and official calls for new cohorts and major events. The alumni group in the social media, in contrast, represents a forum for versatile communication for alumni and accelerator management, including, for example, announcements of *ad hoc* visits, small informal notifications, and platform on which to share interesting hints for investments or news on the edtech industry. The role of a sector-specific accelerator is to be an enabler for insightful and useful encounters. Having an in-house office links a startup to the alumni network and serendipitous encounters with peers, in contrast to startups located elsewhere. However, it seems that even though during the programme the startups create close connections with each other and have much interaction on weekly basis, after the accelerator programme, every startup tends to be focussed and busy with their own venture, and despite the willingness to be an active member of the community, many startups do not have time to be as involved in the accelerator networks as they would like to be.

The first successes were reported 2017. A startup with a solution enhancing socio-emotional skills signed a global distribution agreement for licensing; another startup with a 3D-printing solution signed a distribution deal in the US and has entered into different markets. Many startups have also reported success in fundraising, and there were several international awards and nominations for awards for the accelerated companies. Despite these early successes, though, the ventures remain relatively small. The whole industry is still emerging, not only in Finland but elsewhere as well:

There is no unicorn yet, but I wouldn't be too worried, since it is missing from the whole edu-sector, and there is not going to be one this year.

Mentor in the accelerator (Interviewee 46)

### *International awareness and recognition*

Parallel to the growing awareness and recognition in the Finnish market, the accelerator had from the beginning interested applicants from abroad as well. Already the first cohort had two non-local startup ventures, and the later cohorts have been increasingly international. The summary of figures after the first six batches demonstrate that the accelerator has received applications from 69 countries, and startups from 11 countries have been accelerated in the programme (see Table 13). Especially Cohorts 5 and 6 were more international than the previous ones:

Yeah, so the international aspect of it [the composition of cohorts] has become much more prominent. Nobody knew at the beginning now there are lot of people applying from every continent. I think we've had something like sixty eighty countries applied every single batch the quality is improving all the time. The quality of the startups applying to our programme but that goes hand in hand people getting to know our programme talking to alumni from our programme. So now we have a track record versus the first batch was approval of concept really so now we I wouldn't dare to say we have a brand yet I wouldn't say we have a brand yet but we have... people are familiar with our programme and at least with the accelerator part of it.

Investor/mentor/coach (Interviewee 45)

The composition of international cohorts creates a dynamic of international interaction, which in turn may lead to international opportunities. It is beneficial for the startups to have contact with different marketplaces, and it is not unusual that the startups continue some form of a collaboration after the programme ends.

The process of accelerator internationalisation takes place simultaneously with the internationalisation of individual startups. The internationalisation of the accelerator is linked with the international opportunity development of the startups.

Internationalisation may happen through a foreign branch or through remote programme variants. The accelerator has visions to expand internationally. For the first cohorts, the accelerator gathered experiences from a Helsinki-based programme requiring commitment to be physically present during the programme, which may be an obstacle for foreign companies to apply. The internationalisation of the cohorts triggered the accelerator to develop different types of participation models: (1) moving to Finland

temporarily for approximately three months; (2) participating through regular visits and online, and (3) participating through longer visits at the beginning, in the middle, and at the end; the rest takes place online. Yet, increasing internationalisation pushes the accelerator to consider different virtual models and foreign branches.

The non-Finnish startups have been attracted to a Finnish accelerator due to its educational reputation and contacts with research institutes, as well as because of the addition of coding to the 2016 Finnish core curriculum, which has since become standard:

My main things [expectations towards the acceleration] were to get a chance to develop the product together with the teachers' environment in Finland.

Startup entrepreneur (Interviewee 38)

We decided to enter Finland because programming was becoming part of curricula.

Startup entrepreneur (Interviewee 5)

From a non-Finnish startup's point of view, the Finnish market is a foreign market, and some have also used their time with the accelerator to prepare market entry to Finland.

The edtech accelerator also recognised the importance of events and decided to organise an education-focussed startup event gathering together investors, startups, educators, and other influencers in the field. The event was organised as a side event to the major startup event in Finland: The Slush. The first XcitED event was organised 2017 and continued in 2018 and 2019. In addition, there are several smaller events. The growing Finnish edtech ecosystem showcases edtech-related events by other organisers; for example, Dare to Learn was introduced in 2017 and targeted international and domestic audiences. There are also initiatives around edtech where the accelerator has been actively involved in forming an industry association or an investment fund with an educational focus. These initiatives signal the growing impact of the edtech accelerator in Finland and their intention to be an ecosystem builder. The accelerator has been also very active in terms of establishing relationships to the Nordic and Estonian edtech communities. More generally, the development of Finnish edtech scene has also been supported by initiatives beyond the scope of the accelerator, like HundrED, a non-profit company founded in Finland 2015 with the purpose of seeking and sharing pedagogical



innovations, or the university degree programme in education entrepreneurship, which was launched in Oulu in 2018. Furthermore, an edtech association was founded in 2019.

#### 5.1.1 Defining the edtech accelerator

Reviewing the observations from the previous section, which were highlighted through the story of the emerging accelerator, the specialisation in edtech is strongly present in the accelerator. It shows at all levels, from startups to accelerator activities and networks:

The value for the accelerator comes through the industry specificity...in another accelerator we just said 'hello' to other startups and there was no point for looking for synergies. Here we are at the heart of the Finnish edtech ecosystem.

Startup entrepreneur (Interviewee 3)

As an edtech accelerator, the accelerator is classified as a sector-specific accelerator, which is according to European Accelerator Summit (2016) the case for most accelerators (62%). According to the report, there were in 2018 edtech accelerators in Europe in the following countries: Finland, Norway, UK, Switzerland, France, Poland, and Spain, with two in Sweden. The literature (Drori & Wright, 2018; Isabelle, 2013; Mian et al., 2016) also shows a growing tendency towards sector specificity in accelerators.

In the following, the characteristic features of the edtech accelerator discussed above are placed in the framework of Pauwels et al. (2016), which was first presented in the literature review of accelerators. The building blocks of accelerators have also been guiding the study when drafting the accelerator-related interview questions and, later, in the first round of coding. The coding framework was expanded through inductively derived codes, as discussed in the methodology chapter.

Table 14 The Building Blocks of an Edtech Accelerator

Building blocks of accelerators and respective constructs (Pauwels et al., 2016)	Edtech accelerator	Respective quotes
<b>Programme</b>		
Mentoring Curriculum/Training Counselling services Demo days Location services Investment opportunities	The sector specificity is exhibited in the programme, mentors, location, and characteristics of investment opportunities. Otherwise, the programme consists of usual elements of business development offered by accelerators in general. The lean launch pad method is used. Investment opportunities and internationalisation are key drivers for the startups to join the accelerator programme.	‘Of course, each module was useful, but pitching and lean launch pad were especially useful for us.’ Startup entrepreneur (Interviewee 36)
<b>Strategic Focus</b>		
Industry/Sector focus Geographical focus	The accelerator focusses only on the education sector, especially on scalable solutions. The edtech sector has a linkage to the social impact, and it is being characterised as a ‘slow industry’. The accelerator is located in Finland but attracting startups globally, and the programme language is English.	‘The good thing is that this is focussed. Focussed on education. That is how the deep knowledge emerges.’ Corporate partner (Interviewee 20)
<b>Selection Process</b>		
Open online call Use of externals for screening	The application takes place through a platform, and the requirement is to have a product or at least prototype of a product and a team. 20–30 startups are invited for the interview, and each cohort has reached 100–150 applications. Approximately 10 startups have been selected for each	‘To describe, what is the educational aspect in that product and startup, only those who can

Team as a primary selection criterion	cohort. The startups qualified to the programme are evaluated based on their ability to communicate the pedagogical impact of their product or solution.	explain it can be qualified to the programme.’ Accelerator manager (Interviewee 1)
<b>Funding Structure</b>		
Investor funding Corporate funding Public funding Alternative revenues	The accelerator is privately funded. The corporate sponsorships play an important role. Startups give approximately 3% of their shares for the accelerator.	‘The corporate partners are the life and blood of the company.’ Coach/mentor/investor (Interviewee 45)
<b>Alumni Relations</b>		
Alumni network Post programme support	The importance of the alumni community is acknowledged. The in-house startups are more active due to their physical presence. The accelerator fosters collaboration for the cohorts and startups. The activities of the alumni community take place both online (Facebook group for alumni, newsletters) and offline (events, possibilities to join the training of the cohorts). Alumni startups are geographically spread around the globe. The most active alumni are usually in-house companies.	‘It is really important community for us ... it is both ways you know we want them [accelerator] to be part of our success as we grow because it was such an important point for us but also, we still want to get more value out of them and their networks.’ Startup entrepreneur (Interviewee 32)

### 5.1.2 Internationalising startups in the Finnish edtech context

The previous section focussed on the Finnish edtech accelerator where local and foreign startups participate in the cohort programme. The startups are the unit of analysis, and the study is conducted from their perspective in order to add to the knowledge of startup internationalisation, which differs from that of the internationalisation of small ventures (Coviello & Tanev, 2017). This section further details the characteristic features of edtech startups. The findings refer to the earlier discussion in Section 2.1.2 and, more specifically, the definition of startups; that is, *age*, *innovativeness*, and *growth orientation* of the startups in this study.

None of the startups was older than 6 years as a venture, which is in line with common definitions of startups (Brush & Vanderwerf, 1992; Zahra et al., 2000). Even though the ventures are new, it appears that many of the founders of the startups in this study have senior-level experience from their previous professions and prior ventures. Many of the founder CEOs have either held senior positions in a corporation or ran another venture earlier. The prior companies include both startups and non-startups. Another stream of entrepreneurs represents people with strong educational backgrounds. A minority of the companies are run by young and inexperienced entrepreneurs. Contrary to prior studies (e.g., Kabbara, 2016) which have proposed the digital entrepreneurs are on average young – that is, under 30 years – the profile of the typical entrepreneur in the edtech accelerator is not that of a fresh university graduate but rather people who often have prior ventures and senior-level experience. The entrepreneurs in the edtech accelerator in the Finnish context stress seniority and maturity when speaking about their profiles:

Well, we were all quite old, I am 54, and there were several of my age that somehow it is not this typical startup established by a young student after two years of studies. There were some younger people as well, but almost all were more mature, which makes me think the startup scene in edtech is clearly different from some other sectors.

Startup entrepreneur (Interviewee 18)

I have worked in a corporation, I have been a startup entrepreneur, I have been an angel investor, I have been an advisor, and I have also been a mentor.

Startup entrepreneur (Interviewee 24)

The startups also have differing backgrounds in terms of industries. There is a wide variety of professional backgrounds. Both accelerator management and several partners and startups themselves highlight the importance of mastering all critical elements of an

edtech solution, which relate to the business, education, and technology. The findings show the entrepreneurs in the studied context may be distinguished into two broader groups: (1) entrepreneurs with business or technology background and (2) entrepreneurs with background in education or culture.

As discussed in the previous section, creating learning solutions requires knowledge and networks in business, technology, and education. Similarly, the entrepreneurs and startup teams have varying backgrounds in their respective fields, and one of the purposes of the accelerator programme is to complement the skills, knowledge, and teams in terms of missing expertise in relation to the requirements of successful edtech solutions.

Startups selected to the programme need to have minimum viable products and an ability to articulate the pedagogical impact of their product. This study uses the definition ‘learning solution’ (Tekes, 2015) for the products of the startups. The learning solution contains the idea of a service or product or a combination of both. The products may be combinations of physical products or services and digital products, or they may be purely digital.

Innovativeness in edtech solutions resembles the shift to the global knowledge society that has shaped the requirements of 21st-century competences. Versatile mobile technologies enable connectivity regardless of location or time. Consequently, there are expectations and requirements to adjust the educational models and materials, as the surrounding world changes and digital technologies have already transformed how societies function, including work, communication and leisure time. Pedagogical models are often still equipped for the requirements of industrial societies, despite that the 21st-century societies may be characterised as knowledge based (Dumont & Istance, 2010). The changing requirements call for new innovative pedagogical approaches.<sup>10</sup>

From the educational companies’ point of view, this shift may be a basis for creating opportunities in an emerging market. Table 15 below lists concrete categories of edtech solutions that respond to the needs of the 21st-century competences. The accelerator uses the categorisation for the learning solutions of their startups. Notably, a solution

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<sup>10</sup> Innovativeness in the learning environment may refer to any component in the learning environment: learners, educators, content or resources and in order to achieve 21st-century competences, learning is expected to enhance e.g. collaboration, creativity, communication and the holistic understanding of phenomena using interdisciplinary approaches (OECD 2013)

may be a combination of several categories. Illuminating these combinations, one example of a learning solution is a robot to enhance language learning: that is, a combination of AI and language learning or a digital platform for immersive storytelling combining AR/VR and socio-emotional learning. Therefore, more than one of the categories may apply to a solution, as highlighted in the Table 15. The startups of this study are placed in the table to provide an overview of the types of learning solutions that are under the label edtech.

Table 15 Accelerated Startups According to the Types of Learning Solutions

Category	Cohort			
	I	II	III	IV
Game-based learning	2		2	
Creative development	1	1	1	1
STEM		1		2
Learning and device management	3	3	2	1
AI				2
3D printing		2		
Programming	1			3
Life-long learning	1		1	
AR/VR		2	2	2
Socio-emotional learning	1	4	1	
Early childhood education		4	1	
Language learning				1

Many of the startups continue to adjust their product and business model when they enter the accelerator, and this study emphasises this feature in comparison to the majority of studies dealing with new ventures and internationalisation. The cultural differences and other needs from foreign markets push them to adjust the value propositions and business models for the foreign markets. The reason for using the same product varies between market areas and requires market-related information. The quote below exemplifies the differences between marketplaces. If in Finland social and emotional learning is a value itself, in the Asian marketplace, the argument for the same product needs to be re-formulated to meet the needs of the local educational environment:

If you talk about social and emotional learning. Why would I have my child to bother? If we see this product would reduce bullying at school, and it will reduce examinations stress – oh – interesting. I will use that.

Partner for internationalisation (Interviewee 21)

The ventures applying for the edtech accelerator need to be able to describe the pedagogical impact of the product or at least be able to sketch it. In addition, they are expected to have a minimum viable product during the time they have been selected to the programme. During the programme, they go through lean launch pad process, which enables them to work on their business model and gain further customer insights. Startup ventures that come to the accelerator are at differing stages in terms of product development. Startups are by definition still iterating and constantly developing their product offer. Nonetheless, this study highlights that some of the startups have solutions that can be already sold on the market. The development stage of the product has an impact on the contacts, knowledge, and resources, which are particularly relevant for startups. Managing the parallel processes under time compression is a key element for the startups. Compressing time is an issue for many of the studied startups, who overall report slow development in slow markets.

Startups also criticise that the lean launch pad is too one-size-fits-all, and depending on the level of development, the startups are hoping for more personalised programmes to meet their specific needs. Some of the accelerated ventures come to the accelerator with a product, which is already on the market; some remain in the product development stage. The development of international opportunities is linked to the maturity of the learning solution. However, comparative accelerator research (Cohen, Bingham, & Hallen, 2019) has indicated that, in general, the tailormade programmes offer more limited opportunities. Arguably, product development cannot be distinguished from the other areas of early-venture development, including internationalisation.

The growth orientation and intentions to internationalise are relevant features for this study. The analysis of the startups demonstrates differences in certain aspects of them, even though all of them share the intention to internationalise. This intention is a given, since it is the pre-requisite to be qualified in the programme. However, regarding the level of implementation as to internationalisation, startups differ greatly. For some very early-stage ventures, it remains only an idea, whereas for more mature startups, the international opportunities have already been realised in action. In this study, the concept of international opportunity development is operationalised from exploration to exploitation, where the latter entails foreign market entry. Out of 28 startups, 13 had had international sales during the time of the interview (see Appendix 6), which was 3–12 months after the programme.

Regarding the team compositions, it is usual to have internationally mixed teams, which is in line with the international intentions of the startups. The founding teams are often already internationally mixed. Furthermore, teams hire international talents, or they use international human resources in their value chain activities. A typically outsourced function is the coding of the solution. According to the typology from Oviatt and McDougall (1994), the startup internationalisation is defined by the number of value chain activities and countries. The startup teams for this study have both inward and outward activities in terms of internationalisation. They have also identified that the internationalisation requires international mind set from the beginning. Their experience in prior ventures is decisive of the mindset towards internationalisation. Particularly the startups with founders who had successful prior ventures take this mindset for granted:

If you have already built one global company, you understand it is only one flight away. Anything.

Startup entrepreneur (Interviewee 24)

All startups share international intentions – regardless of the level of prior professional background and area of expertise. Even though most startup entrepreneurs have a very international background, there were also ventures that did not have that background, and they were seeking international competencies from the training, as they felt they were lacking this expertise. In terms of internationalisation, the international cohorts contribute to the development of international opportunities:

I didn't have export background, and so we wanted to have a flying start and be part of this kind of ecosystem and come and learn from others and be guided and mentored.

Startup entrepreneur (Interviewee 9)

The non-Finnish startups become embedded in Finnish edtech startup community, but as the process of embeddedness is a two-way process, they also influence the context in which they are embedding. Through the contacts of the non-Finnish startups, the Finnish startups, in turn, have the opportunity to build new relationships in the respective home market environments of non-locals. In the study of internationalisation in internationally mixed, digital environments, the networks are by nature international. The international opportunities developed through the accelerator networks require one to address the question of relevant accelerator networks for internationalising startups, which is the purpose of the next section.



### 5.1.3 Networks of an edtech accelerator

As was discussed in the literature review, internationalisation is connected with networks (Coviello & Munro, 1997; Coviello & Cox, 2006; Etemad et al., 2001; Oviatt & McDougall, 1994). Likewise, studies on accelerators and incubators (Bøllingtoft & Ulhøi, 2005; Cooper & Park, 2008; Pettersen et al., 2015; Tötterman & Sten, 2005), the latter of which were also reviewed due to the lack of accelerator research, stress the importance of networks. There would be several options and perspectives to study network embeddedness. Referring to the notions from the literature (Slotte-Kock & Coviello, 2010), this study takes a holistic view and studies the startups embedded in various networks, which are exogenous to the firm: accelerators and networks of relevant partners and stakeholders in the edtech sector. One of the key tenets here is that startups both are influenced by context and influence context.

This study focusses on edtech accelerator located in Finland, and therefore it generates deep contextual knowledge of the actors in the accelerator network in one specific context. In order to explain how accelerator networks enable startups to internationalise, the analysis proceeded as follows. The first step was to identify and analyse the key networks of an accelerator in the chosen context of the research. The strategy in data collection was emergent, meaning that new interviewees were contacted and the original plans updated parallel to the increased understanding of accelerator networks. The text materials and observations provided information related to the context and had a complementary role throughout the process, such as feeding further interviews, creating categories for coding, contents for the coding, and finally comparing different sources of data in terms of the final analysis.

As a result, following groups are significant for the edtech accelerator, according to this study (Table 16): *peers*, *co-creation partners*, *partners for internationalisation*, *mentors*, *investors*, and *corporate partners*. Following Table 16, each type of network relationship is discussed, and the analysis focusses on context-specific features. The findings of this study highlight co-creation and internationalisation partners, which have received less attention in the accelerator literature on key stakeholders of accelerators (Vandeweghe & Fu, 2018). In the following, the networks facilitated by an accelerator are discussed. Both internationalisation partners and public sector partners for co-creation play a role in the early internationalisation of startups. The spatial dimension of

network relationships covers industry specificity and location (Halinen & Törnroos, 1998; Welter, 2011), and this study indicates that a sector-specific accelerator fosters the process of becoming embedded in relevant networks both locally and internationally. The findings of local and international dimension of relevant networks is aligned with those of prior studies (Andersson et al., 2013; Leppäaho, Chetty et al., 2018).

However, as interaction among Finnish and non-Finnish startup peers is such a significant factor, it makes sense to study startup cohorts holistically and not to divide them according to the national backgrounds. Hence, the geographical context is problematised and networks come into focus. This insight leads to the finding that defining the spatial dimension in an international accelerator with digitalised startups is not straightforward.

Table 16 Identified Networks and Contextual Characteristics

Local and international networks facilitated by the accelerator and evidence from the quotes	Context-specific findings
<p>Peers</p> <p>‘Like it is role modelling to some extent. I felt like I was able to look other companies so... so and have different aspects of what they did that I could look up to and yeah because they are your peer group it still feels accessible.’</p> <p>Startup entrepreneur (Interviewee 32)</p>	<p>The peers are sources of mental support, practical help, and contacts for further networks are pivotal. The startups mention active startups independently from the cohort they represent; in other words, there are active influencers in the startup community of the accelerator that are known regardless of the cohort. The frequently mentioned startups seem to have the reputation of sharing and being open and helpful to others. Interestingly, accelerator management mentions the same startups as success stories. The startup community consists of Finnish and non-Finnish startups as well as startups of mixed origin.</p>
<p>Public sector partners for co-creation and early customer references</p> <p>‘There used to be the situation with the exports of education that the potential foreign customers asked the edtech companies that how the feedback is from Finnish teachers and so on... and earlier startups couldn’t co-create, since there was a high barrier for public-private collaboration.’</p> <p>Accelerator manager (Interviewee 1)</p>	<p>Public–private collaboration impacts on all startups not just accelerated ones, accelerator acted as a trigger to overcome the obstacle to internationalise, that is, lack of customer references. The startups appreciate the co-creation opportunities. The first customer references in Finland contribute to the development of international opportunities both for local and non-local teams. Some have also had an opportunity for international pilot projects.</p>
<p>Partners for internationalisation</p> <p>‘It [internationalisation] progressed. For us the main thing was the US market and they had contacts there.’</p> <p>Startup entrepreneur (Interviewee 15)</p>	<p>A network of similar foreign organisations and partner organisations refers to relations to several beachheads internationally, as they call them. The first Finnish accelerator in the global accelerator network. An active partner for internationalisation in Hong Kong. Incoming international delegations of schoolteachers and principals due to the Finnish reputation for education and closeness of the University of</p>

	Helsinki. Startups have been connecting each other to international relations as well.
<p>Mentors</p> <p>‘I [a startup entrepreneur who was first a mentor and later startup entrepreneur] started working as a mentor in the first batch. Then I was already with one foot always there.’</p> <p>Startup entrepreneur (Interviewee 28)</p>	<p>Experiences differ among startups. This study also provides evidence for a reverse order of the roles in mentoring: from mentor to startup founder. For some startups, mentoring was significant in terms of internationalisation. There were also startups that did not miss the mentoring; some of them found it was poorly coordinated and that the mentors were too busy.</p>
<p>Investors</p> <p>‘The objective is to attract investors, convince them to invest in education and further develop ecosystem.’</p> <p>Accelerator manager (Interviewee 30)</p>	<p>Investments in edtech are characterised by long-term investments and social impact. The emergence of an alternative investment fund with focus on education during the 5<sup>th</sup> batch.</p>
<p>Corporate partners</p> <p>‘That [corporate partnerships] could be more ambitious. There is more potential if that was more established it would be fantastic.’</p> <p>Startup entrepreneur (Interviewee 37)</p>	<p>These are necessary for the accelerator business model. Some startups have also had closer collaboration. However, the corporate partners are the enablers of the accelerator and therefore play a crucial role.</p>

The startups forming the peer community of cohort peers and alumni peers is an important network facilitated by the accelerator. The *peers* are pivotal as sources of mental support, practical help, and contacts for further networks. Peer support happens both at local level and internationally. Startups have varying team formations in terms of national backgrounds, and increasingly, international cohorts mean increasingly international peer networks. Certain well-known startups in the community are active in accelerator events and have the most visibility in the accelerator channels. They were also startups that had made good progress. The frequently mentioned startups seem to have the reputation of sharing and being open and helpful to others. The startups that have stayed in the venue and rented an office there have easier access to the community startups due to their physical proximity. They also appear to be sparring partners for new cohort startups.

The literature on accelerators (e.g., Cohen and Hochberg, 2014) discusses *mentors* as substantial for startups. In this study, mentors have varying significance to startups. For some they played a supportive role, for others they have additional, optional value, but many startups did not even use the mentoring services. Some of them did not miss the mentoring; others found it was poorly coordinated and that the mentors were overly busy. Some find the responsibility lies on the startup's shoulders. The expectation is that the entrepreneur is active in seeking advice. One of the startup entrepreneurs, however, commented that there was even overflow of potential mentors and that they did not have time to meet them all. Despite that mentoring did not seem to play a major role, there was also evidence of when the mentoring had been particularly useful for advancing international opportunities.

In the edtech accelerator, sector specificity is always exhibited also in the mentoring. Some of the mentors are business mentors whereas many of them are pedagogical mentors having background in the education. Evidence (Yitshaki & Drori, 2018) on the 'giving back' phenomenon suggests that successful startup entrepreneurs end up as mentors in accelerators. Interestingly, the edtech accelerator in this study shows examples of contrary movement. Some entrepreneurs were experts in the field and asked to be mentors, later becoming startup entrepreneurs in the same accelerator. This finding imparts the idea of the accelerator as a hub where the roles of being an advisor and being advised may change. There are also examples of the usual order of the 'giving back' phenomenon, where a founder of an accelerated startup is available as a mentor

for later cohorts. Even though the majority of mentors are Finnish in origin, in all there is a wide variety of nationalities and broad expertise covering areas of business and investments, technology, and education.

In the context of edtech, schools and other educational institutions are in a key role as *co-creation partners*. Thus, the role of an accelerator in the studied context has been a trigger in the process of starting up and systemising co-creation and collaboration between public sector actors and small private sector actors. This systematic collaboration enables startups to overcome the obstacle of lacking domestic references. The references from the Finnish schools are helpful not only for the Finnish startups but also for non-Finnish startups. From the municipality's point of view, the accelerator took the initiative and sped the process of creating a systematic approach to collaboration between schools and startups and creating templates for the required contracts and create clear process descriptions. Once completed, the systematic approach benefits the entire entrepreneurial ecosystem of Finnish edtech companies, not only the startups in the accelerator, which speaks to the role of the accelerator as an ecosystem builder. The bridging or connecting role of an accelerator at the public–private interface has been crucial, since it is not evident how to make schools and small ventures collaborative. Despite the overall positive views in terms of co-creation, there was also criticism regarding the usefulness of co-creative endeavours. Unless the evaluation criteria are well defined, there is a risk of not actually learning from the experiments. Co-creation does not need to lead to a successful outcome. A trial that simply fades away without proper evaluation is worse than a failure, which is defined as a failure based on the evaluation criteria.

The *partners for internationalisation* represent a network of similar organisations in several countries. The accelerator has also, during the first years of its existence, established relations with global organisations related to accelerators and learning. In addition to the international partner organisations, some partners are companies dealing with the internationalisation of edtech that are closely related to the accelerator. The international aspect is also present through the numerous *ad hoc* visits that provide the potential for startups to present their products and make useful international connections. Startup entrepreneurs name help for the internationalisation and finding investors as their usual expectations for the accelerator.

Attracting investments to the Finnish edtech ecosystem has been a challenge that the accelerator has been trying to solve in their role as an ecosystem builder. The network of *investors* is emerging. Further contacts through the accelerator management are also important. The new networks emerging through accelerator networks are both local and international. An alternative investment fund with a focus on education was established during the second year of the accelerator to strengthen investment opportunities for startups in Finland. The role of social impact is exhibited also in investment decisions. Finally, *corporate partners* are significant for the accelerator, which is a startup itself. Corporate partners participate in the selection of startups, and they have differing roles, such as sponsoring activities and workshops. From the startups' point of view, corporate partnerships represent unexploited opportunities. The startups consider the accelerator to be relatively strong in terms of its connections to the public sector and schools, but the accelerator would benefit from having more industry partnerships.

Figure 13 is a modification of Figure 3 from the literature review and draws together findings from Section 5.1. The figure displays the key events and major milestones of the emerging edtech accelerator, programme cohorts, and accelerator networks positioned in the wider context of edtech ecosystem. The temporal context is significant for a startup, influencing the units of analysis in this research depending on whether a startup had attended the first cohort (which was still at the piloting stage and where the networks were still emerging) or a later cohort (when the programme was more mature, the networks wider and more international, and the concept validated through the initial successes). After each graduation of a cohort, the alumni networks widen. The startups and alumni have their own prior networks. Through success stories, the accelerator gains visibility and can expand the network of external partners.

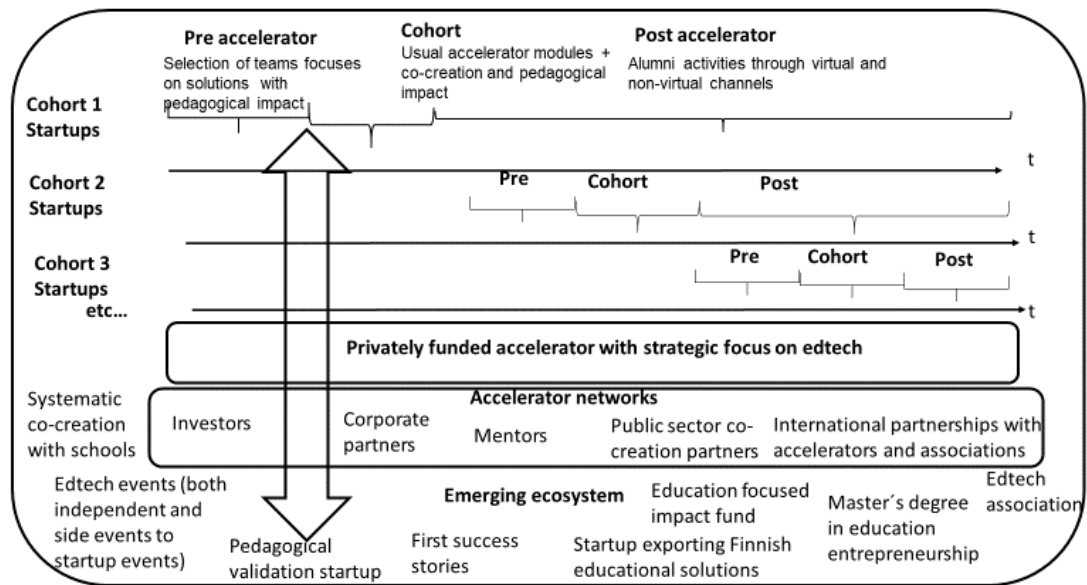


Figure 13 Edtech accelerator and the relevant networks.

This part of the analysis has detailed the first research question related to the accelerator networks. The remainder of Chapter 5 focusses on development of international opportunities and the role of accelerators as embedding mechanisms.

## 5.2 Development of international opportunities in the Finnish edtech accelerator

If you focus on edtech in a country like Finland, you need to be international from day one.

Startup entrepreneur (Interviewee 23)

The focus now shifts on the development of international opportunities through accelerator networks. That part of the analysis was completed by first coding the data and identifying findings related to international opportunities. The next step was to group the findings to aggregated categories and, thereafter, a further aggregated grouping of themes emerged. Three categories of mechanisms result: *networks*, *resources*, and *collaboration*. The table in the Appendix 5 highlights the process of categories-creation for higher levels, and for each finding there is also empirical evidence covering all the types of data sources. Combining the mechanisms with the network partners (5.1.3), the result is aggregated knowledge on the development of



international opportunities through the accelerator networks. The data clearly indicate that the edtech-relevant networks are both local and international.

The results of this phase in the analysis are summarised in Table 17 below. Following the table, this section focusses on discussing the micro-processes related to the networks, resources, and collaboration. The discussion begins with networks both informal and emergent, as well as systematically built and organised.

Table 17 Development of International Opportunities through the Accelerator Networks

Development of international opportunities through accelerator networks	Networks facilitated by the accelerator	
	Local	International
Networks	Informal and emergent	
	Systematic and organised	
Resources	Tangible	
	Intangible	
Collaboration	Pre-determined goals	
	Open goals	

### 5.2.1 Networks

Through the accelerator networks, startups can access further networks which are important in the interactive, linear, and iterative process of developing international opportunities. The findings of the study indicate different types of networks, including startups in other cohorts and earlier cohorts, networks of accelerator management, and partner networks. The accelerator is a hub that facilitates networks and enables new networks to emerge. The accelerator facilitates networks by searching for suitable partners and negotiating systematic agreements with key partners locally and internationally. Other types of networking result from informal, unsystematic, and serendipitous encounters, where the combining element is, however, in one way or another the accelerator.

Contrasted with other accelerator studies, this study identifies the importance of *co-creation* and *partners for internationalisation*, which have received less attention in the accelerator literature. The aim of the accelerator is to establish a strong edtech ecosystem in Finland. In the early stages of accelerator development, the founders had identified the bottleneck: the lack of domestic reference customers. As a result, the accelerator started actively developing public–private partnerships and living labs, which enable startups to co-create and test their products with schools, in turn contributing to the acquisition of first domestic customer references. First domestic references, in turn, support internationalisation. The non-local startups have also been keen to create networks with actors in Finnish education and edtech. As an international hub, the accelerator enables encounters for both groups.

Furthermore, the international network of partnerships contributes to the development of international opportunities by allowing startups to have their first pilot projects abroad. In terms of partnerships, there are varying levels of activity:

Hong Kong education city has by far worked the best. It is the most systematic model after the programme is finished. They receive information, and they let us know which ones they want to test.

Accelerator manager (Interviewee 30)

In addition to the local and international partners in education and enhancing internationalisation, different events bringing together investors, startups, corporations, and other influencers in the field count as organised and systematic efforts to enable further networks to emerge. The events are a clear expression of an emerging profile for the accelerator.

On the other hand, in addition to the official accelerator networks, the accelerator is a hub enabling serendipitous encounters that connect actors in the network and may play a role in the development of international opportunities. The effect of the latter is more difficult to capture, but the interviewees often referred to the community and to the important meetings that led to further contacts and opportunities to enter new markets.

In addition to formal partnership agreements, accelerator management also brings connections to different organisations, persons, and embassies, for example. Those connections have been helpful in addressing the specific needs of the startup ventures. Some of the startups entered foreign markets after graduation from the programme and

explicitly mentioned the role of the accelerator networks and the concrete support and internationalisation boost as a major benefit of the programme:

It is a global publisher for learning materials, and it came through the accelerator.

Startup entrepreneur (Interviewee 7)

The findings show that the sector specificity of the accelerator seems to have a significant impact on the networks. The revisited Uppsala Model (Johanson & Vahlne, 2009), and the further-adjusted version for the entrepreneurial internationalisation by Schweizer, Vahlne, and Johanson (2010), stresses the network position in internationalisation. Internationalisation results from the change in network position from outsider to an insider. Based on the findings from this research, becoming an insider in the relevant networks fosters development of internationalisation. Therefore, networks are the key, instead of certain geographical location. The current study suggests the accelerator may have a role in this transition from an outsider to an insider. In sum, accelerator networks may increase embeddedness in relevant edtech networks both in systematic and organised ways as well as emergent and informal ways, and they may thus change the position of a startup from outsider to insider, leading to international opportunities and further to internationalisation.

The prior networks of the founders were also significant to the researched startups, in line with findings of prior research (e.g., Evers & O’Gorman, 2011). In the accelerator environment, the startups connect other startups with their prior networks. The peer-to-peer networks and an emerging community are also important from the role model perspective. Especially experienced entrepreneurs with prior ventures seem to rely more on their own prior networks than on accelerator networks. Startup entrepreneurs have also had ventures prior to the current startup. The strong existing business networks may result from the previous venture:

Well, it is definitely never going to be easy but it is of course a huge resource for us that we have over 15 000 schools in register and all the contracts with them completed and we have lots of teacher fans, who recognize our brand.

Startup entrepreneur (Interviewee 23)

Since internationalisation usually begins after graduation from the accelerator, active contacts in the alumni community seems to be one of the factors explaining why some startups perceive stronger network support in terms of international opportunities. In-house startups have better access to foreign visitor groups, which appear in the accelerator premises regularly. They also see other startups in the community more

frequently and can share with them useful contacts and hints regarding foreign markets. The perceived value of accelerator networks and their role in internationalisation vary among the startups from strong support to no support at all. Some entrepreneurs are disappointed by the lack of support in terms of internationalisation. The usefulness of networks is contrasted with the prior expectations. However, having access to networks enables startups to reach new networks and new resources – both tangible and intangible, as discussed in the next section.

### 5.2.2 Resources

Startup entrepreneurs in this study express that their main expectations to join an accelerator are related to finding investors and relevant contacts for internationalisation. The selection to the programme, the validation of the product (including pedagogical impact), and the programme itself (with key contacts and community-related resources) were identified in the analysis as resources needed for the development of international opportunities.

Selection to the programme triggers both tangible and intangible resources. A clear tangible resource needed for the internationalisation and market growth is related to acquiring funding. Even if investors do not necessarily come directly through the accelerator, the competitive selection and participation in an accelerator fosters the credibility of the startups in various ways, which favourably impacts further negotiations of funding. Selection to the programme itself works as a positive reference. The ratio of accepted startups in relation to the applications is less than 10% per cohort in the edtech accelerator. Thus, acceptance to the programme is a favourable reference, for example, in further negotiations for funding. The entrepreneurs stressed that being part of the community and having graduated from the programme automatically changed the responses they were receiving and enhanced their credibility:

It played a role in the further investment round; it was a status thing to get accepted.

Startup entrepreneur (Interviewee 18)

Acceptance to the accelerator has also immaterial benefits; in other words, it also increases one's confidence in one's own venture. Surprisingly even entrepreneurs with prior successful ventures speak about the importance of confidence building. Regardless

of background, startup entrepreneurs share the same uncertainty, and selection to the programme is a verification that the team may have the potential to turn the idea and emerging venture into a sustainable business. The need for confidence also shows at the level of the sector-specific startup community as a whole. In an emerging sector, the successes of other edtech ventures provide confidence that there is potential for success in other ventures as well.

Another aspect of resources relates to the ongoing process of developing and validating products simultaneously to the development of international opportunities. In the context of education, validating the product with certificates by externals may become a key issue in the search for initial customer references, access new markets, or further funding. The private sector in Finnish education is almost non-existing, and in order to get a reference from a customer, public–private partnership is significant. By admitting certificates as a result of co-creation, public sector partners support startups with international aspirations:

We developed this co-created with the city of Espoo quality stamp, which is available for companies who have finished the process according to the systemised approach.

Representative from the municipality (Interviewee 19)

In addition to the certificates proving the co-creation within Finnish schools, certificates that validate the pedagogical impact have become useful for the startups trying to enter foreign markets. In addition to the potential customer, the pedagogical evaluation plays a role in investment decisions. Investors, who have education technology in their portfolio but feel they lack expertise to validate the solutions from the pedagogical perspective request evaluation services. In consequence, the increasing number of edtech companies has led to the emergence of pedagogical evaluation services. For edtech, pedagogical impact and investment are related. In summary, the certificates are an indication of pedagogical impact. The ability to demonstrate that impact has potentially a positive effect on the foreign sales or potential investments:

What we do now is that we say everything we promote and are pushing to the marketplace in Asia has to be evaluated by  $x$  [a company specialising in pedagogical evaluations] because then we have an evaluation process that we know the education quality is there and the research behind the product concept is sound.

Partner for internationalisation (Interviewee 21)

The edtech startups may also increase their credibility in the market by having their learning solutions nominated for an award or by winning an award. Such awards are typical for edtech events and what is valued is innovativeness or pedagogical impact. The winners are able to leverage the visibility of awards in their communication and marketing and use them as evidence of quality. Likewise, the edtech accelerator uses awards as an indicator of quality in their communication with the startup community and external partners.

Even though both accelerator management and startups stress the significance of the accelerator through the emerging ecosystem rather than through the programme, the programme itself contains resource-related aspects as well. First, the selection to the programme gives a formal structure to the early-stage development, which especially less advanced startups appreciate, as it forces them to focus and pushes them forward. Knowledge gained from the programme means knowledge-related resources for the team. As was discussed earlier, the accelerator programme consists of usual training modules of accelerators. The sector-specific feature is related to the co-creation opportunities with the educational institutions. As also discussed earlier, the background of edtech entrepreneurs varies from business and technology to education and even areas of culture. The differing backgrounds of startups influence expectations of the programme, which, in turn, impacts perception of the programme. In addition to the background, the development stage of the startup is a significant factor determining the usefulness of the program:

We are already quite advanced in our internationalisation... that we were further than many others, and therefore, we would have wished for more individual support and check where we are and, for example, what we had thought were the negotiations with  $x$  [potential partner for international collaboration] if we could have gone through them within the programme, but perhaps there was no space for it. But there could have been more focus on where we are now and what we need.

Startup entrepreneur (Interviewee 12)

Depending on the background of the founders and founding teams, expectations towards the accelerator contacts and programme differ. Some teams have strong technological or business backgrounds. For these companies, the expectations towards the accelerator relate to increasing knowledge in the educational sector and obtaining connections from that sector. Some of the companies in that category were also looking for pedagogical resources for the team, advisor, or networks and confidence to be in the

edtech scene. The other type of teams, which covers educator entrepreneurs but also people with cultural backgrounds such as in music, film and the like, and for that type of participant, the business model development has proven useful:

For me personally this was very good as business training but also to see I've done things correctly but now I have more confidence and the right terminology.

Startup entrepreneur (Interviewee 12)

In many teams, founders have complementary skills to cover the relevant fields required for an edtech solution; that is, technology, business, and education, or they complemented the team with the missing skills already before coming to the accelerator. However, some of the startups find the accelerator especially useful to complement the team:

One of the reasons to join was that we wanted to find a good resource with educational background.

Startup entrepreneur (Interviewee 8)

Whether the programme should be better tailored to meet the differing needs of the startups is debated. There is research advocating the benefits of standardised approach in accelerators (Cohen et al., 2019) and specialised networks (Soetanto & Jack, 2011). In this study, the startups strongly expressed wishes for a customised approach and felt the one-size-fits-all approach was helpful to them neither in terms of the programme nor the networks. There were entrepreneurs who had senior-level experience and companies prior to the current edtech venture:

If you have already founded several companies in your life, you could let others concentrate on this [general business training], but we wanted to know about the pedagogics.

Startup entrepreneur (Interviewee 26)

The accelerator has acknowledged the need described above, and consequently, the cohort programme has been under constant evaluation. The accelerator is aware of the feedback, and they have reacted to it by making changes. Instead of providing lectures, accelerator management has seen the benefits of more tailor-made approaches and workshops. However, the mix of different startups at different stages, as well as following similar types of programmes, is partly due to the resource limitations of the accelerator, which is itself a startup. Even though the accelerator recognises the personalised needs, they emphasise that a more-personalised approach would not be possible, due to budgetary constraints.

Even though the definition of an accelerator does not stress physical location as a key characteristic, the studied accelerator offers in-house offices for several startups, and those utilising that service seem to form tighter communities. This research shows that physical location is also key both for individual startups and for the edtech community. The startups that have stayed on the premises emphasise the role of peer support and access to have contact with foreign visitor groups. Interestingly, in-house ventures are mentioned by the later cohorts as active and helpful companies, and thus, they play a significant role in the formation of the community.

Startups commonly face sudden or unexpected changes in the team composition, even multiple times, just before, during, or immediately after their time in the accelerator programme. Startups also go through rapid changes in team dynamics if their business development is positive and if they need to recruit new team members. Sharing a location enables, for example, transfers of human resources. As the growth of startups is difficult to anticipate, startups have sometimes recruited team members only to notice then the new hire has too few tasks. In such cases, there may be another venture needing additional resources. The everyday connections through the same building enable arrangements such as sharing a team member more easily, but virtual platforms, for example the accelerator's alumni group on Facebook, also contain initiatives for such arrangements. The accelerator as a hub enabling resource acquisition is a channel to find suitable team members and announce calls for recruitment, but also whether team members are available for other startups, for example, half-time solutions. Startups also share information regarding topics other than human resources, such as available office space. In general, information and knowledge sharing occur frequently in the Finnish edtech accelerator, leading to a discussion of the final category: collaboration.

### 5.2.3 Collaboration

The third identified aggregated dimension of international opportunity development is collaboration. The manifestations of collaboration are seen within and between different groups: among the startups in the same cohort, within the alumni community, and through partner networks facilitated by an accelerator. Collaboration takes place locally and globally, through local and international startups and partners. The analysis of this



study indicates collaboration with pre-defined goals, and collaboration, which is more open in nature (Table 17).

From the accelerator's point of view, the importance of collaboration has to do with ecosystem building. The expected outcome of a strong community is that accumulated knowledge stays in the system, as startups are often temporary organisations (Blank, 2010) and as not all of them are long-lasting. The sense of community leads to knowledge dispersion within the industry:

Not all of them will succeed, but if they know each other as a group and after some startups have finished the knowledge stays in the industry they may transfer to other startups.

Accelerator manager (Interviewee 1)

The accelerator facilitates peer support in a number of ways. Firstly, the selection of ventures for cohorts covers both advanced startups and early-stage ventures. The heterogeneous combination is seen as an asset. Secondly, the accelerator organises targeted activities to create team spirit within a cohort. Thirdly, the accelerator puts continuous effort into activating alumni and maintaining the alumni community through digital platforms and other means, including social events. The international startups bring their viewpoints and connections, and thus, the peer community is international and enables the development of international opportunities. Peer support is also initiated by an investor, who has, for example, CEO gatherings for his portfolio startups and encourages CEOs to have lunch meetings or shadow each other's activities. Such initiatives may lead to further collaboration in foreign markets. The ability to collaborate is also critical from the investor's point of view:

Those who do not know how to collaborate simply fall out.

Investor (Interviewee 17)

The background of the entrepreneurs is versatile, and the heterogeneous cohorts learn from each other through sharing. Peer support and community seem to be key benefits even for those startups that felt they did not benefit significantly from being part of the accelerator program. For startups, collaboration with other startups takes different forms: some have more structured and pre-defined goals – as in collaboration to enhance sales and marketing, collaboration in value chain operations, and product-level collaboration – while others are more open in nature, as in exchange of experiences and advice, even mutual feedback regarding solutions. Startup entrepreneurs refer to the mental support of other startups which turned out to be much more than they had

anticipated before the program. Only another startup entrepreneur may understand the high level of uncertainty linked with founding and running a startup:

Under the surface we share the same problems and feel the same uncertainty.

Startup entrepreneur (Interviewee 16)

The sharing of experiences happens in an unstructured way, yet it may be facilitated by the accelerator or by an important stakeholder, such as an investor. The mental support the entrepreneurs give to each other enables them to build trust, and the strong peer community provides a basis for the potential collaboration in foreign markets. Collaboration in foreign markets may take many forms, introducing leads, inviting other startups to co-create or test events, sub-contracting, and offering physical premises, investments, and joint marketing efforts:

This is a remarkable community like you always find those links so there is no need for cold calls here and there but usually you always have somebody who says I will introduce you to that person and it helps further.

Startup entrepreneur (Interviewee 2)

A typical example of collaborative commercial efforts is to share a booth in an exhibition. The startups find that despite collaborative ideas at the product and technical level, the lack of resources and the fact that all are small and at the beginning of their path is an obstacle to solidifying the collaboration. Within the cohort, peer support occurs through an intensive program, within the alumni community mainly through the events and increasingly through the social media channels. The in-house startups from the alumni community also have unplanned and unstructured encounters with cohort startups. Regarding international opportunities, the alumni companies that have been able to make it to the foreign markets are important role models that can help in the important confidence-building of other startups.

Collaboration appears also in the co-creation with schools facilitated by the accelerator. In general, startups go through iterative product and business model development and need to be closely connected with the customers to further develop their products while they are simultaneously building an organisation and already taking their first steps in international markets:

And to iterate in rapid cycles, and be in close connection with the customers is essential and an accelerator provides us an opportunity to do it.

Startup entrepreneur (Interviewee 15)

The accelerator has been a bridge builder between startups and public sector partners

and has enabled them to overcome obstacles and scepticism regarding collaboration with the municipality. Without the push from the accelerator, not all of them would have realised the value of co-creation with schools:

For a startup, collaboration with a city appears a nightmare – meaning endless amount of time consumed and no progress and everything just one big fight at the end of the day. I mean if the accelerator wouldn't have pushed us to that direction, I know it may sound arrogant, but I would have never ever in my right mind interfered in any activities steered by a city or a municipality, and then it turns out that they have genuine interest and, to my own surprise, this KYKY was fantastic.

Startup entrepreneur (Interviewee 24)

However, even though the interviewees stressed the opportunity for co-creation with schools, there are also critical voices that consider that startups may easily lose their focus if they are too long reacting to the endless wishes expressed in co-creation events. Some of the startups were well connected before their time with the accelerator, and they did not see the co-creation opportunities offered by the accelerator as being decisive as those for whom the accelerator opened the doors of co-creation.

From the international opportunity point of view, the research shows that the co-creation element adds value to early attempts at internationalisation. In one case, the co-creation element caught the attention of a foreign partner company representing a startup in the Asian markets, and later the collaboration led to a global distribution contract:

The great thing about the product when I first saw it was that it was truly co-creative product. I mean she spent a lot of time talking to kids, and they did research with kids. It is. . . it was kids' influence to have certain characters. All these things made kids more linked to the product.

Partner for internationalisation (Interviewee 21)

There is thus evidence that co-creation is needed to further develop the learning solutions and leverage the reputation of Finnish education through references from co-creation in the home market aiding in foreign market entrance. Likewise, for startups originating outside Finland, connections with the actors of Finnish education provide a valuable reference.

In summary, the analysis of the development of international opportunities through the accelerator networks leads to the insight that product development and emerging international opportunities are linked. The co-creation partners (networks), external

validation of quality (resources), and co-creation activities (collaboration) support this insight.

### 5.3 Typology of internationalising startups in the edtech accelerator

That you are known and there is a link to something. A link to something that you aren't just simply a startup from Oulu or Tampere. You are part of something larger, and that itself is already significant.

Startup entrepreneur (Interviewee 10)

The findings discussed in Section 5.2 identified how international opportunities are developed through accelerator networks. The focus now shifts to individual startups. In order to answer one of the research questions – that is, how startups use network embeddedness to develop international opportunities – the startups are now analysed through dimensions derived from the central concepts of this study and the emerging understanding of the empirical data. The analysis is a combination of the development stage of international opportunities, the development stage of the learning solution, and the development of international opportunities through accelerator networks.

The first round of analysis regarding startups included immediate memo-writing after each interview (Step 1, in Table 12), and a later analysis of startups was completed with reference to different sources of data. The initial memos were completed by collecting further information (especially Steps 2–3 and Step 6 in Table 12). The descriptions of startups are based on the interviews – the time of interviews being 3–12 months after the startups had finished the accelerator programme. In addition, other sources of data were used, including extensive observations and documents such as reports, statistics, newsletters, newspaper articles, and social media posts. The startups are positioned in a typology consisting of three dimensions. The choice of the dimensions for the typology presented in this section result from confronting the empirical knowledge with the existing knowledge regarding startups (product, i.e., learning solution in the area of edtech), international opportunities (development from exploration to exploitation operationalised as foreign market entry), and network embeddedness and accelerators (development of international opportunities through accelerator networks). A summarizing table (see Appendix 6) refers to this phase. This phase was finalised

during the Step 6 (see Table 12) of the analysis. The dimensions of the typology are briefly explained next.

The findings regarding the *development of international opportunities through accelerator networks* (in Section 5.2) serves as a basis on which to analyse that dimension at the startup level. Each of the startups was analysed according to categories of local, and international networks, resources and collaboration.

In terms of the *international opportunities*, all the startups in the accelerator have international intentions, which is also one of the selection criteria to qualify to the programme as discussed earlier. From the research's point of view, international intentions are important since research related to the nascent ventures and internationalisation often does not explicitly distinguish whether it was new venture's intention to internationalise or something that happened coincidentally (Coviello, 2015). The exploitation of international opportunities follows the operationalisation of foreign market entry, and 46% of startups had already entered another market through foreign sales. However, considering the emerging character of startup ventures, the amounts of sales remain modest, and even startups having already sales do not necessarily have sustainable business in the end. The rest, that is, 54% of interviewed startups, were exploring their first international opportunities at the time of the interview (3–12 months after the programme end).

Additionally, during the field period, it became apparent that the startups differ considerably from each other in terms of their *learning solutions* and their readiness to enter the market, which is in line with the character of startups as specific types of ventures going through several parallel processes. Startups do not necessarily generate any revenue, and therefore, the product or solution may be unfinished. Since the characteristics of startup ventures are pivotal in this study, this feature is included in the analysis to emphasise the characteristics of emerging ventures that are going through iterative development and reach a contextualised explanation, as discussed in the methodology section.

Startups are positioned according to three dimensions: development of international opportunities through accelerator networks (high vs. low), the learning solution (ready for the market vs. under development), and international opportunity (exploration vs. exploitation). Correspondingly, an illustration of typology is provided in Figure 14,

where the startups are given the codes SU1 (Startup 1), SU2 (Startup 2), SU3 (Startup 3), and so forth.

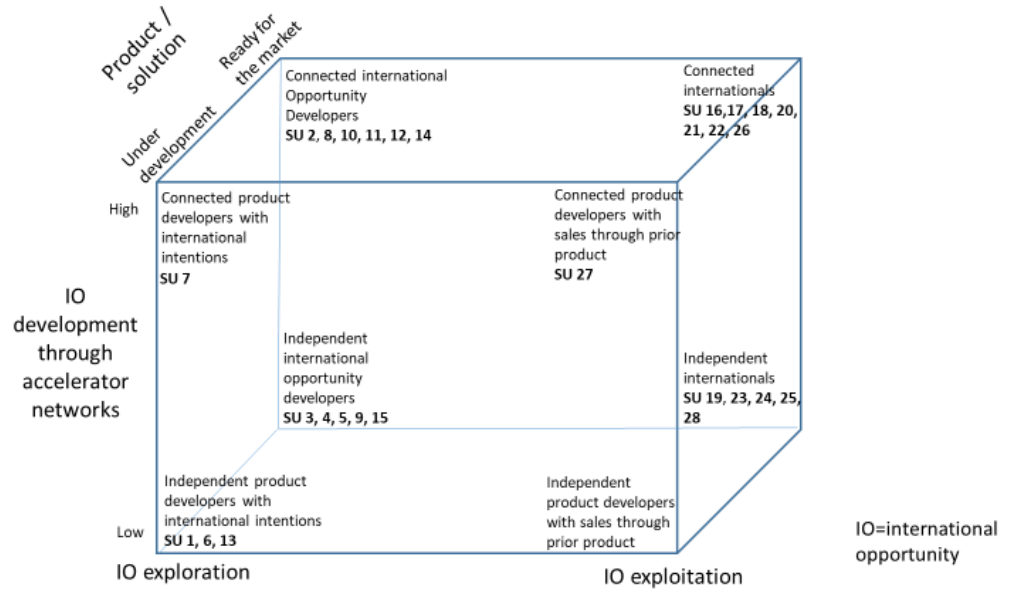


Figure 14 Internationalising startups in the context of Finnish edtech accelerator.

Table 18 lists startups using pseudonyms and in terms of the classification in the typology. The startups were given pseudonyms, reflecting the core characteristics of each startup and resulting from the analysis. At different stages of analysis, memos and summaries were written to manage the massive amount of raw data (Steps 1, 4 & 7 in the Table 12), and the pseudonyms emerged from startup descriptions.

The order of the startups Table 18 is random; it is ordered neither by cohort nor by whether startups have exploited international opportunities, by their level of international opportunity development through accelerator networks, nor by their development in terms of product. The anonymous treatment of the startups in the following is not an obstacle to articulate relevant points regarding different combinations. Thereafter, each of the categories of the typology is detailed separately.

Table 18 Internationalising Startups in the Context of Finnish Edtech Accelerator

SU	Startup pseudonym	Category
1	<i>Globally oriented startup in product-development stage</i>	Independent product developers with international intentions
2	<i>Internationalising co-creative startup</i>	Connected international opportunity developers
3	<i>Mature startup with local customers and first international pilots</i>	Independent international opportunity developers
4	<i>Startup team with versatile professionals prepared for international edtech markets</i>	Independent international opportunity developers
5	<i>Active member of edtech community with first steps towards internationalisation</i>	Independent international opportunity developers
6	<i>Long-term product developer with international vision</i>	Independent product developers with international intentions
7	<i>Startup with intentions to internationalise innovative learning solutions</i>	Connected product developers with international intentions
8	<i>Startup entrepreneur with a prior successful exit</i>	Connected international opportunity developers
9	<i>Experienced entrepreneurs in search for networks in the educational world</i>	Independent international opportunity developers
10	<i>Startup gathering customer insights and pitching exercise</i>	Connected international opportunity developers
11	<i>Veterans in the startup environment running a startup</i>	Connected international opportunity developers
12	<i>Innovative startup with flying start</i>	Connected international opportunity developers

13	<i>Startup building confidence and making relevant network connections</i>	Independent product developers with international intentions
14	<i>Startup attracted by the Finnish teaching environment</i>	Connected international opportunity developers
15	<i>Startup with strong pedagogical and entrepreneurial background and international vision</i>	Independent international opportunity developers
16	<i>Networked and internationalised active startup in the edtech community</i>	Connected internationals
17	<i>Startup with global mindset and only international customers</i>	Connected internationals
18	<i>From research project spin-off to international markets</i>	Connected internationals
19	<i>Realistic goal-oriented startup with clear focus and international plan</i>	Independent internationals
20	<i>Determined international startup maximising the pace of learning</i>	Connected internationals
21	<i>From an international project to the international market launch</i>	Connected internationals
22	<i>Truly diverse startup with a strong mission to make positive impact in the world</i>	Connected internationals
23	<i>Startup with previous success and strong own networks</i>	Independent internationals
24	<i>Startup taking the first steps in the internationalisation</i>	Independent internationals
25	<i>From a mentor role to a startup founder</i>	Independent internationals
26	<i>Startup attracted by international perspectives and developing their social impact angle</i>	Connected internationals
27	<i>Profit-making social startup with intentions to expand to further digital solutions</i>	Connected product developers with sales through prior products
28	<i>Startup team with strong technology and business background from the corporate world</i>	Independent internationals



Given the dynamic nature of network embeddedness (Halinen & Törnroos, 1998; Johannisson et al., 2002) as well as opportunity development (Ardichvili et al., 2003), the position of the startups in the typology is not static. Even startups that are in the category ‘connected internationals’ may or may not survive the first critical years of the new ventures. The following analysis explains the mechanism of embeddedness and the outcome and business implications by highlighting related micro-processes. In order to do so, the analysis follows the approach of Jack and Andersson (2002). The analysis identifies patterns of becoming embedded in edtech context through accelerator networks, answering the sub-question of how startup ventures use network embeddedness to develop international opportunities. Each category is discussed in a separate section.

This study found evidence of seven of eight categories. The only category without any empirical evidence is the ‘product developers with sales through prior product’. However, even though this research did not provide evidence for this combination, theoretically this combination is possible, as startups may also enter the accelerator with a prior product or solution and be in the process of developing a new solution such as SU27.

In summary, the findings of the following analysis show that accelerator networks enhance the early internationalisation by enabling necessary investments for growth and both direct and indirect contacts to the foreign markets. Depending on the stage of the life cycle, the contacts have been contacts to sell products or do tests in the foreign markets. The sector specificity of contacts is the major enabler of startups to utilise accelerator networks, and somewhat unexpectedly, physical proximity plays an important role in community formation, despite the digital nature of the products and various digital channels the community uses. As to the blocking factors, the right timing to enter the accelerator is crucial to exploiting available opportunities. The gap between the expectations and the perceived level of usefulness in terms of contacts is likewise a blocking factor for some of the startups in this research.

### 5.3.1 Connected internationals

Table 19 Connected Internationals – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business internationally	Quote to support the idea
SU 16	Networks. Being at the core of edtech ecosystem. Sector specificity is the key. Programme and trainings are not the major issue. Startup counts to the active ventures in the edtech community and also supports other startups.	<p>The startup stayed in the venue and had the benefit of numerous foreign visitor groups, delegates, and spontaneous encounters.</p> <p>The team joined the accelerator programme at a relatively advanced stage of development.</p>	<p>The startup already had international sales and a product at advanced level of development.</p> <p>The Hong Kong Ed City connection opened thanks to the accelerator.</p>	‘One concrete example was the connection with Hong Kong Ed City, it wouldn’t have happened without the accelerator.’
SU 17	Sector specificity in networks and within the alumni community	They stayed in the venue; company benefits from the regular foreign visits and physical location.	There was no direct impact on internationalisation but indirect impact through the ecosystem and increased credibility.	‘In my opinion the added value is that you only have educational ventures and that they incorporate the Finnish pedagogical expertise in accelerator activities and the university is strongly involved.’
SU 18	<p>Versatile networks and resources</p> <p>Appreciates the sector specificity</p>	The main investor came through the accelerator, and they also continued in another hub of startups.	They found partners and started international operations.	‘The challenge for the first batch was they were setting up everything...but now we see it has developed into fine ecosystem with international visibility.’

SU 20	International networks, resources, and peer networks	This startup stayed in the venue.	The contacts through the accelerator helped in the US market entry.	‘The main thing for us to come to the accelerator was to get international contacts through it and for us specifically to the US market.’
SU 21	Resources in terms of knowledge and business development  Had previous contact networks with national export programmes	To enhance business skills and confidence building, in other words, to realise they have done many things quite right in the past.	The investor contacts and contacts to the Chinese market resulted from the accelerator.	‘As a result, eight investors showed interest and now we start negotiations.’
SU 22	Networks and collaboration with the schools  The international founder team emphasises the impact of their solution, the importance to work for greater cause	The team stayed in the venue and is actively involved in accelerator networks.  They received new viewpoints to iterative, continuous product development.	The startup started internationalisation through projects that came through their own contacts. However, networks to the education world have been important.	‘It changed our whole product development.’
SU 26	Came to expand networks and have an international perspective and mostly due to the Finnish education  As a non-Finnish company and due to the distance, limited chances to be part of the community, but they see the benefits of the community	They received pedagogical validation for the product and they were able to better articulate themselves as a social impact company.	They have started international sales through their own contacts.	‘The reputation of Finnish education and the progressiveness of it and Helsinki in particular and working alongside the university there that was a very attractive thing for us.’

Table 19 highlights connected internationals. They are startups that have already a solution they are able to sell, they have sold it in another country, and they have also utilised the accelerator networks in the development of international opportunities. For connected internationals, local and international networks facilitated by the accelerator have been useful. They appreciate sector specificity, and they have been able to leverage embeddedness in their internationalisation in versatile ways through networks, resources, and collaboration. Ventures in this category can easily list concrete benefits in terms of internationalisation or funding, due to connections through the accelerator. They also seem to have had networks in the broader edtech or startup ecosystem already before the accelerator time. Some of the startups in this category have been involved in governmental export programmes. However, accelerator networks have expanded their overall contact base in the edtech sector.

A pre-requisite for this category is a learning solution which is ready for the market and a venture that has already started internationalisation. The startups in this category are advanced among the accelerated startups. Many of them continued staying in the accelerator building, having their offices there, which automatically increases their contacts to accelerator management, other startups, and partners in the network. Flexible and serendipitous encounters are enabled by their physical presence. Many of the startups in this category belong to the success stories of the accelerator, and the startups in other cohorts know them or they have visibility in events and in the different channels of accelerator communication. Startups in this category highlight the feature not only of startups embedded in the context but also of the context being influenced by the startups.

The startups in this category emphasise the benefits of being part of the larger structure; that is, accelerators relate to their role as ecosystem builders. The accelerator networks have enabled them to become embedded in the emerging edtech sector. In terms of internationalisation, they also have their own established networks and have utilised them in their international opportunity development. Even though they are advanced in terms of the development of the solution, further updates and developments are needed. There is also evidence that even in this category, the accelerator has been an important influencer in the continuous process of product development.

### 5.3.2 Connected international opportunity developers

Table 20 Connected International Opportunity Developers – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business internationally	Quote to support the idea
SU2	Resources and networks	Stayed in the venue and actively involved in the community with visibility through awards and nominations in startup competitions	The outcome was funding and contacts to start negotiating global distribution deal. In terms of internationalisation, the mentoring was pivotal. They used the accelerator time to build up the networks both locally and globally.	‘The most valuable part of coaching and mentoring was everything related to the internationalisation.’
	Active and visible networker; no prior experience from the field of education			
	A role model for other cohorts as a success story	One of the success stories in the accelerator		
	Co-creative product development with the Finnish schools	Overflow of mentors, finding right advisors, and subsequently finalising the contracts for international sales		
SU8	Key mentors opened contacts	Despite one successful previous exit, the role of key mentors in building confidence	The participation in the programme accelerated the speed of development. They have international pilot projects running in several locations globally.	‘When somebody at his level [experienced mentor] says it makes sense what you are doing, it is crucial for the confidence building.’
	Became a mentor to later cohorts			
	Contacts to schools	Positive results from co-creation with schools		

SU10	New networks, particularly with experienced mentors and schools	Pedagogical validation for the solution and knowledge, especially to communicate the business idea for different audiences	The accelerator contacts led to further contacts including an international project.	‘We met with our mentor first and then the mentor invited us to an event, and there we got a new contact who gave us recommendations, and then I called xx [an organisation with whom they had their first international project] directly.’
SU11	The team has solid background in technology, business, and innovation. Expanding networks within a formal structure and utilising the hub of numerous informal encounters.	Became part of the edtech ecosystem  Stayed in the venue  Reference from accelerator is a quality stamp	They consider the potential of international networks for the future. The foreign partner networks including international accelerators are a potential option.	‘Well many said to us you could be coaching instead of being coached.’
SU12	Through collaboration, that is, co-creation with schools and networking with various mentors	A clear framework for collaboration with schools  The accelerator accelerated the pace of their development	The main outcome was negotiating international deals and funding. Their solution attracts media and it has been easy to receive visibility.	‘I just think about the KYKY project; you really get the recognition that co-created with schools of Espoo, so there is value.’
SU14	Through networks and collaboration. The product development and test environment with Finnish schools and teachers.	Collaboration with other startups	After acceleration they started negotiating funding and international sales.	‘It is credibility...pedagogically that is the biggest value of that part and it... it is definitely we are kind of seeing the responses being different after that so that is definitely a positive thing.’

Table 20 presents connected international opportunity developers. They are startups that already have a solution, which they are able to sell; they have not sold it in another country, yet for them accelerator networks are a significant mechanism in international opportunity development.

Connected international opportunity developers have also become embedded in the relevant networks through the accelerator contacts and networks. Still, in terms of international opportunities, they have not yet exploited any international opportunity defined as foreign market entry. There are many similarities with the former category. Companies in this category leverage various mechanisms. Collaboration in its different forms is clearly present among the ventures in this category. They have actively used various opportunities that accelerator networks provide such as mentoring and the contacts and expertise of mentors to support their intentions to internationalise. Developing products further through co-creation and testing with schools play a significant role as well.

Some of the connected international opportunity developers stayed on the premises, and all of them have shown activity in the edtech startup community. The startups in this category value the role of an accelerator as an ecosystem builder and consider that there are also concrete benefits. Their product is sufficiently mature that they are able to sell it to the customers. Some of them were negotiating international sales during the research interviews.

### 5.3.3 Connected product developers with sales through prior products

Table 21 Connected Product Developers with Sales through Prior Products – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business internationally	Quote to support the idea
SU27	Had extensive networks in edtech in advance  Peer influencer within cohort  Accelerator attendance to systematise the approach	Team shares the experience of systematic development due to guided programme.	The programme enabled the team to have common vision. The startup has had sales from the very beginning; it has strong partner networks and some international sales.	‘We were trying to move forward in a process which assumes there is already an edtech product so in that sense too we did not match with the pattern.’

Table 21 shows the connected product developers with sales through prior products; that is, companies continue to develop a product but have already international sales through a prior product.

This category demonstrates that startups have different levels of expertise and that they do not necessarily come to the accelerator with their first product. Thus, the startups represent different stages of a startup's life cycle. In other words, the startup may have experience from product development, international sales and negotiating funding, and within the same venture that they are in an accelerator while developing a new product. Due to its background, this type of a company is well connected and already embedded in the edtech networks. The experience makes it also a strong influencer among peer startups. A startup like SU27 is also in a position to connect other startups with relevant industry players if they recognise a potential mutual benefit.

At the same time, a startup belonging to this category is at the beginning of the curve in terms of new product and business model development while developing a digital version of their educational offering. In this research, profit-making social startup matches this category. In this particular case, the main motivation to come to the accelerator despite their solid background was a strategic decision to participate and, thus, to have external time pressure for the systematic development.

Before the startup came to the accelerator, its CEO was already involved in the accelerator as a mentor. This is an example of the reverse order of the usual logic, where startup entrepreneurs become mentors after the accelerator program, since the CEO was already mentoring in the accelerator before participating in one of the cohorts. This is a good example of two-way support and influence. The relationship of being a mentor or being mentored may vary, and the startup is not automatically in the latter position.



#### 5.3.4 Connected product developers with international intentions

Table 22 describes connected product developers with international intentions, which are early-stage companies. Among the startups of this study, only one venture was in this category. The ventures are still developing their products, and thus, they intend to internationalise. Companies in this category, however, actively engage themselves in the community in other words in various networks that the accelerator facilitates. They actively utilise the opportunities in the accelerator. This category displays that the product development and the international opportunity development are indeed parallel and overlapping processes.

Table 22 Connected Product Developers with International Intentions – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business internationally	Quote to support the idea
SU7	<p>International and domestic networks and collaboration opportunities</p> <p>Becoming embedded in international environment was useful for a domestically experienced entrepreneur</p>	<p>They had collaboration with peers such as sharing stands in exhibitions.</p> <p>Learning international sales was another major outcome.</p>	<p>Some initial contacts in terms of internationalisation, but the international opportunities came too early regarding the stage of their development. The product was not mature enough.</p>	<p>‘They (HK edcity) selected companies among accelerated companies and we were one of them.....it turned out their expectations were little different than what we could offer.’</p>

The timing may be the critical point for the ventures in this category. The accelerator period may open new networks regarding sales opportunities, but a startup in this category does not necessarily meet the expectations of potential customers. A startup may explore opportunities but cannot exploit them, due to their own development stage. This observation raises the critical question of the right timing for a startup to join an accelerator.

### 5.3.5 Independent internationals

Table 23 Independent Internationals – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business internationally	Quote to support the idea
SU19	<p>Networks and Finnish reputation of education</p> <p>Realistic expectations towards the accelerator and clearly defined objectives – a new curriculum with programming – why to join a Finnish accelerator</p>	<p>They emphasise the network part and being part of the community. Peer help shows, for example, when somebody is recruiting. They still have occasional contacts with the accelerator and startups there, for example, through events or idea exchanges.</p>	<p>Funding and international sales; the Finnish market is the first foreign market.</p>	<p>‘I think a lot of people just expect accelerators make magic for them. Make your company successful. It is not that. It is basically there are resources in terms of people and knowledge that it is more up to you how you use it.’</p>
SU23	<p>Collaboration with selected peer startups</p> <p>Core team consists mainly of educators already involved in a successful startup that was sold to a major technology corporation</p> <p>Already experienced in running a startup, but recognize that every venture is different</p>	<p>For this startup the main outcome was peer collaboration.</p> <p>They name investing in peer companies, sub-contracting and sharing advice.</p>	<p>The company sells internationally and utilises heavily their prior contacts. Edtech companies need to be international from day one, and they have also focussed on foreign markets, particularly in the US market.</p>	<p>‘I am little tired with this statement the companies should go together...if you know your customers and where to sell I find this networking that you hear nowadays all the time, it is not necessary. The outcome of some delegations has been really poor...’</p>

SU24	<p>Team of Finnish and non-Finnish members mainly selling abroad</p> <p>Accelerator brought international networks</p> <p>Inspired by peer startup examples</p>	<p>They progressed in their business-model development.</p>	<p>They feel they could not utilise the international networks fully since they were there too early. First international steps were taken through their own contacts, especially LinkedIn.</p>	<p>‘I just feel like there is so many more things we could have done on the international level getting other clients and things in that nature if we would have been little further along.’</p>
SU25	<p>Resources and peer networks</p> <p>Involved in the community as a mentor before the startup</p> <p>Rewarding to co-create and develop products with Finnish schools</p> <p>Community needs to be international</p>	<p>They found an investor and built up a network of peer startups.</p> <p>Regarding Finnish reputation in education, founder sees danger of building on something which can rapidly change and is beyond the control of the company.</p>	<p>They conduct international sales through the web.</p>	<p>‘...get international pilot projects and investors those were the expectations. Most of them were not met to be honest I have to say but we met x [name of the investor] and he is our seed investor now.’</p>
SU28	<p>Networks mainly to other startups</p> <p>Industry events connect alumni</p> <p>Network members exchange market information regarding different markets</p>	<p>For this startup the value was limited to peer support and relationships among startups.</p> <p>They used mentoring to some extent.</p>	<p>They have started international sales through their own contacts. They would have appreciated more hands-on approach in terms of internationalisation.</p>	<p>‘Not for us...it seems they select the companies in which they truly put emphasis on.’</p>

Table 23 demonstrates independent internationals. Startups in the category have a product ready for the market, and they have had international sales but do not report very many connections or activities gained through accelerator networks. On one hand, they were already experienced entrepreneurs able to progress on their own, and on the other hand, they were startups which had their first foreign sales early in the development curve and were unable to utilise accelerator networks due to the early development stage of the venture. They were independent internationals in some cases because they were physically distant from the accelerator. Distance seems to play a role, despite the virtual tools and methods available to stay connected and in spite of the fact that the accelerator literature does not stress location as does the literature on incubators.

The expectations in this category vary. For some startups in this category, the accelerator was a disappointment. It is, however, somewhat unclear whether they are disappointed because they could not utilise the accelerator as a mechanism to develop international opportunities or whether they did not start utilising the opportunities that the accelerator facilitates, since the accelerator did not meet their expectations. The connecting role of the accelerator remains weak in this category, in any case. There were also critiques in this group regarding the effective use of resources. Attending an accelerator means balancing between the use of scarce resources, including time, and the achieved benefits.

Startups may also be overall quite satisfied with the accelerator even though it has not helped them to establish many contacts. The number of contacts is not necessarily crucial. More than quantity, quality matters. Peer support in various forms was clearly evident in this category as well.

It is also important to note that companies utilise their prior contacts while exploring and exploiting international opportunities and may be embedded in edtech networks despite their more passive role in the accelerator. Regarding the identified accelerator networks, the startups leverage peer networks in their development. The combination of prior contacts and peer connections evidences the mutual influence of embeddedness: The context influences the startups, and startups influence the context by bringing their prior contacts.

### 5.3.6 Independent international opportunity developers

Table 24 Independent International Opportunity Developers – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business internationally	Quote to support the idea
SU3	Networking through linking startup to a larger community	<p>Collaboration ideas with other startups</p> <p>Due to physical distance startup has remained passive in keeping contact with the community.</p>	The venture created first contacts to international test markets.	‘The best results have come through our own networks. Our chairman of the board has a very international network and it is surprising what kind of leads you get through LinkedIn.....in a way people are really ready to help and network these days.’
SU5	<p>Networking and resources in terms of knowledge</p> <p>Remarkable support through peer community</p>	<p>Investor contacts</p> <p>Overall support by peers</p>	They started first pilot projects for testing purposes in the international markets.	‘Looking back the accelerator did not have very many connections to the day care sector.’
SU4	<p>Selected networks</p> <p>Peer community</p>	A key contact for pedagogics through accelerator	International contacts through peer networks.	‘Not necessarily massive volumes [contacts] but certain individuals, yes.’

SU9	Essential for experienced entrepreneurs from a different field to become embedded in edtech and education networks	<p>Contacts to start co-creation with public sector partners</p> <p>Pedagogical evaluation</p> <p>Credibility that helps to arrange formal meetings</p>	Increased credibility for further investments. They are organised in a networked way and have international supply chain partners.	‘The educational world...we weren’t that familiar with it what are the opportunities there. What does it contain, what would be our niche? Having seen so many different ventures in our batch and though all of them speaking about schools and education. That was eye-opening.’
SU15	<p>Networks and contacts, especially in terms of co-creation</p> <p>Active member in the alumni community</p>	<p>Tests and pilot projects with public sector partners</p> <p>Strong in pedagogics already before the accelerator time</p> <p>Validated for pedagogical impact</p>	Regarding international contacts, there were promising starts, which did not lead to anything concrete though.	‘I think the weakness is that everybody starts [internationalisation] as a very small company or as a very small project.’

Table 24 indicates independent international opportunity developers. Startups in this category have a solution ready for the market, but they have not yet sold their solution internationally. The role of accelerator-facilitated networks in the international opportunity development is at a relatively low level. Often, startups in this category are at an earlier stage of development. Compared to connected international opportunity developers, the startups in this category are not as engaged in the community and accelerator networks.

It is typical for this category to have to have some initial international contacts. The contacts through the accelerator may have seemed more promising than were the actual results, which may be due to various reasons. This finding regarding contacts applies to internationalisation, funding, and collaboration with larger companies.

Referring to the edtech context, startups have been able to validate their products pedagogically through tests and pilot projects. Pedagogical development of the solutions contains the idea of mutual development; that is, it enables the involved organisations to renew themselves.

The impact on the business as a result of accelerator embeddedness has been modest. Yet, for the further development, the connections to co-create are of importance. Even if the outcome of accelerator-facilitated networks does not lead to concrete benefits, the increased level of credibility has an indirect effect during the negotiation, for instance, of further funding. Peer support is again clearly visible, as in all categories.

#### 5.3.7 Independent product developers with international intentions

Table 25 startups in this category are developing both a product and international opportunities. They have not used accelerator-facilitated networks widely. The startups in this category are at an early stage in terms of both product and solution development and international opportunities. These ventures benefit from the accelerator time also in terms of organisational development, in addition to their product and the development of international opportunities.

Table 25 Independent Product Developers with International Intentions – Mechanisms, Outcomes and Implications for Business

	Mechanism and nature of embedding	Outcome	Implication for business	Quote to support the idea
SU1	<p>Resources and networks. They found it useful to belong to the peer community even though the area of edtech is large and versatile and there is no clear focus area.</p> <p>The startup has a business model with potential to be globally scalable and based on extensive use of networks.</p>	<p>CEO is an experienced entrepreneur and professional in the field of education.</p> <p>Startup is still developing their product and benefitted from the workshops that encouraged the entrepreneurs to ask for customer feedback during the product development. Customer insights developed service further.</p>	<p>Further funding resulted from increased credibility in the eyes of the potential investors.</p> <p>In terms of the international opportunities they are still at the preparatory stage.</p>	<p>‘It brought us credibility and helped us to get investors on board.’</p>
SU6	<p>Networks to find a missing link to the team were important.</p> <p>Coaching to acquire funding</p> <p>Founder and CEO is experienced entrepreneur with long-term international vision for the startup</p>	<p>Finding a suitable expert to the team was the main outcome.</p> <p>Their product approach (a holistic approach with a group of related products and a long cycle of product development) did not fit well with the accelerator programme.</p>	<p>Due to longer product development cycle the product launch was planned further ahead.</p>	<p>‘We realised we need to have pedagogical research to strengthen the concept, and through the accelerator we were able to access the university of Helsinki and found an educational expert to the team.’</p>
SU13	<p>Create contacts and networks and as an international team become embedded in the Finnish system and navigate in the Finnish business environment</p> <p>Inspired by some success stories from earlier cohorts</p>	<p>They had major changes in the team and the accelerator was significant for the organisational formation and confidence building.</p>	<p>Initial international contacts came through the accelerator. The venture is at early stages yet.</p>	<p>‘So, they invited us or kind of gave us extended invitations to community of events and things that they thought we could get value of, which was really nice of them, these types of things. You know like kind of dragging us along.’</p>



Startups in this category join the accelerator early in their development curve, and potentially, the benefit would be greater if they would have been further ahead. On the other hand, the accelerator may bring some key contacts that help the venture to reach the next level or gain the necessary credibility in the market to convince investors. In this category, it appeared that the products also differed in nature. They were solutions linked with learning aspects but not necessarily solutions, which would be developed to go to market fast. Therefore, it was not even realistic to assume that they would have been sold internationally 3–12 months after the programme end.

For an early-stage venture, getting accepted to an accelerator gives confidence. It has been a conscious decision by the accelerator management to have in the cohorts a combination of startups representing different development stages. For a startup at an earlier stage, the accelerator provides a platform for development, which can create a foundation for international opportunities at later stages.

#### 5.4 Re-visiting conceptual framework

In line with abductive theorising, the conceptual framework has been under constant change throughout the research process, and several iterative rounds form a continuous dialogue between the empirical data, the emerging case, and the theoretical framework. The initial framework in Chapter 3 served as a starting point for the empirical inquiry; in this section, the conceptual framework is re-visited, and the developed version is presented. The development of the conceptual framework results from the process of ‘casing’ and ‘systematic combining’.

International opportunity development, defined as an interactive, non-linear, and dynamic process, stresses the interaction between different actors, that is, startups, accelerator, and network partners in the emerging edtech sector. Both the conceptual framework and empirical analyses highlight the multiple layers of embeddedness. The startups become embedded in accelerator networks, but the startups are embedded in their prior networks, which represent different areas depending on the entrepreneur’s background: business, technology, education, and culture and arts, as the empirical analysis demonstrates. On the other hand, the emerging accelerator is becoming embedded in the industrial context. The framework highlights these different layers.

In the final phase of empirical analysis, the purpose was to identify the mechanisms that steer the interactions at the levels of *startup – accelerator*, *startup – networks*, *accelerator – networks* and *startup – startup*. Following the method of constant comparison, the interactions were viewed by comparing previous rounds of analysis and all types of data sources, then placing the findings in the framework. The patterns of mechanisms were identified by combining findings from previous rounds of analysis. Throughout the analysis, the intention was to integrate the context of edtech into the theorising and not to treat it separately from the final round of analysis.

Resulting from the final round of the synthesis in the analysis, and combining the emerging case and conceptual framework, this study proposes the following framework and identifies mechanisms – connecting, development, and peer support – which explain how accelerator networks enable startups become embedded in the edtech context and develop international opportunities in an interactive and non-linear manner, parallel to product development through networks, resources, and collaboration. Referring to the typology discussed in a previous section, the conceptual model considers different types of accelerated startups. A more-detailed discussion explaining mechanisms follows below, in addition to the re-visited conceptual framework (Figure 15).

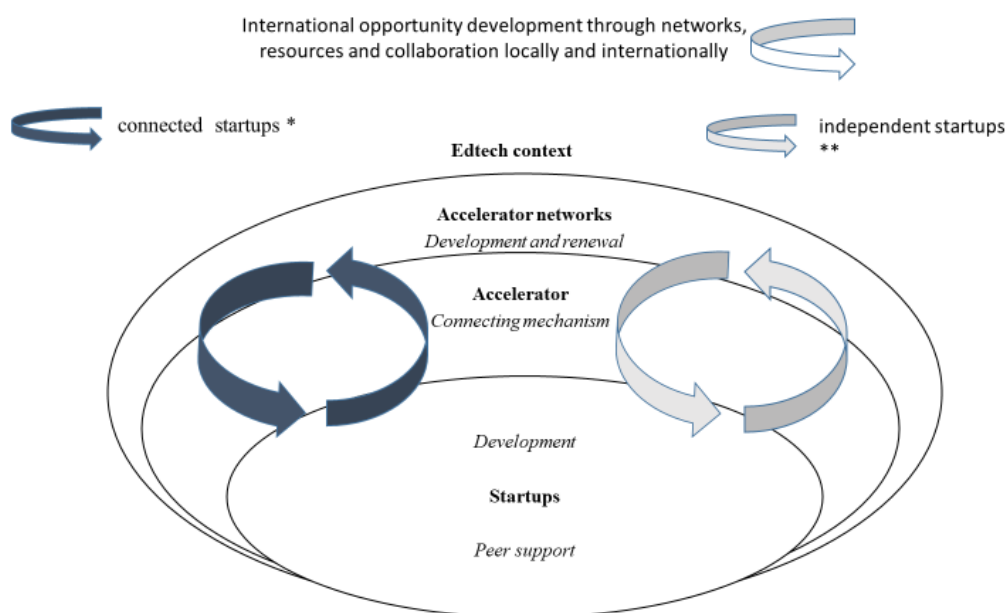


Figure 15 Accelerator networks as an embedding mechanism.

\* connected international opportunity developers, connected internationals, connected product developers with international intentions, connected product developers with sales through prior product

\*\* independent international opportunity developers, independent internationals, independent product developers with international intentions, independent product developers with sales through prior product

### ***Startup – Accelerator – Networks: Connecting***

The edtech accelerator connects startups in the same sector by orchestrating the selection of the cohorts and running the programmes, during which team-building activities enable participants to become acquainted with each other, build relationships, and create trust. Sector specificity guarantees the relevance of the connections.

Therefore, a focussed accelerator differs substantially from a general accelerator. In terms of international opportunities, startup ventures represent different spatial contexts, and becoming embedded in relevant networks is the key rather, than a specific geographical area. The startups represent different levels of development in terms of international opportunities and their learning solutions and become embedded in accelerator networks to different extents. The connected startups use accelerator networks in international opportunity development. This study, however, provides evidence also that the so-called independent startups, who do not develop international opportunities through accelerator networks, do enter foreign markets. Thus, accelerated startups may be classified into connected and independent startups, and both types enter foreign markets.

From the accelerator's point of view, connecting startups through the accelerator is not only targeted to support the development of individual ventures. The startups have a high failure rate. The key is to ensure that even though not all of the startups succeed, the knowledge stays in the industry, which strengthens the overall emerging industry. An accelerator connects a combination of local and international startups with different professional and national backgrounds and maintains a network of startups and partners with the purpose of ensuring long-term knowledge accumulation in the given industry.

For sector-specific partners and stakeholders, it is easier to approach startups as a group to find the most suitable potential collaboration partners instead of approaching any of the startups as a single startup. The key here, from the network partner's point of view,

is the role of the accelerator as a link between startups and network partners, enabling contacts to startups through centralised coordination, agreements, and arranged events. In addition to the coordinated agreements, accelerator management connects single startups when appropriate with their relevant prior contacts, which are not partners of the accelerator.

The edtech accelerator connects local and international partners and contacts of accelerator management with startups. Referring to the findings in Section 5.2, international opportunities are developed through accelerator networks and subsequent dimensions may be identified: networks, resources, and collaboration. Further analytical coding led to the following, more detailed categories. Accelerator networks enhance the international opportunity development of startups through systematic and non-systematic networks, tangible and intangible resources, and collaboration with open and pre-defined goals.

#### ***Startup – Startup: Peer support***

The mechanism of peer support refers to the relationships between startups. Mutual support means sharing information, knowledge, contacts, and resources. Startups share unique features, which do not characterise more established firms. Throughout the study, it was evident that the startups participating in an accelerator and later belonging to a community of alumni benefit from the community. The mechanism of peer support covers both intangible and tangible support, varying from vague ‘mental support’ to concrete activities. Even for many startups, it is difficult to articulate the nature of the peer support, yet they strongly argue that peer support is a key driver in the accelerator. The peer-support mechanism in the startup–startup relationship shows through the new networks that the startups are able to develop through their peers. In this study, ‘the power of peer support’ is exhibited through the versatile activities the peers share. Even though each startup venture focusses on its own development, startups strongly sense that being part of a strong community is beneficial for them. Peer support is present within accelerator cohorts and in the larger community of accelerated startups, and this support encompasses collaborative efforts in the local and international markets.

#### ***Startup – Networks: Development***

On one hand, ‘development mechanism’ refers to development and renewal of the activities of network partners, which motivates actors to be part of the startup

community and bring their input. On the other hand, for startups the development relates more to the level of their own venture, which, in turn, if it develops, also renews the whole sector. The accelerator enables developmental relationships between the network partners and startups. As the classification regarding startups demonstrates, though, not all startups are embedded in accelerator networks. These independent startups may, however, have their own sector-specific and relevant connections locally and internationally, and they may contribute to successful international opportunity exploitation.

In the startup and accelerator environment, businesses are emerging. As contrasted with established intra-industry linkages, the whole industry may still be emerging. Startups influence context, and context influences startups. Partners and stakeholders see startups not only as business opportunities but also as important drivers for renewal and change. Partners and stakeholders are essential for startups to establish sustainable businesses. As a result, the industry sector continues to develop. Thus, accelerator networks enable startups to develop products parallel to international opportunities, and through the development of startups the network partners develop and renew their organisations.

The actors – startups, the accelerator, and industry-specific network partners – relate all to each other in terms of the credibility. The good results of any of the actors help the others to increase their credibility; that is, the success stories of startups benefit the accelerator to attract new partners and startups but benefit also the whole emerging sector. On the other hand, if the accelerator and a sector partner agree to an interesting contract, the partnership increases their credibility and helps to attract high quality startups.

The findings of this study are based on the edtech context only. In line with previous studies focussing on narrow context (von Briel, Davidsson, & Recker, 2018) and considering the lively discussion, understanding entrepreneurship through contexts (Welter, & Gartner, 2016; Welter, Gartner, et al., 2016), one may, however, argue that the theorising may be valuable beyond the focal context of edtech.

## 6. Conclusions and discussion

‘If you wish to navigate through the sea area of Helsinki, it does not help to have a nautical chart of San Francisco bay.’

Startup entrepreneur (Interviewee 24)

This case research has portrayed the first years of an edtech accelerator. It includes the first cohorts of startups and, in particular, the early attempts to develop international opportunities. This final chapter of the thesis highlights what it has revealed about accelerator networks and internationalising startups embedded in an edtech context.

As the quote above highlights, startup entrepreneurship displays differently in different contexts. Thus, there is an increasing need for context specific studies. In a similar vein, the entrepreneurship literature calls for views that bring diversity to the dominant Silicon Valley approach of growth entrepreneurship (Lehmann, Schenkenhofer, & Wirsching, 2019; Pahnke & Welter, 2019; Welter, et al., 2019). This research has addressed this call by focussing on the Finnish edtech accelerator. Critical realism as the philosophical position allows to focus on the contextual details.

This chapter discusses this study’s contributions in three areas: knowledge regarding accelerators (Section 6.1), the discussion of international opportunities (Section 6.2), and network embeddedness (Section 6.3). This discussion leads to suggestions of propositions (Section 6.4). Thereafter, the discussion turns to the implications for practitioners (Section 6.5), divided into three main groups: management of accelerators, startup ventures, and organisations involved in the early-stage venture growth. It then considers the limitations of the study (Section 6.6) and offers suggestions for further research (Section 6.7).

This research adopted an abductive approach to address accelerator networks as a mechanism for startups to develop international opportunities and become embedded in the edtech industry context. The abductive approach guided this research, as shown in Figures 1 and 9. Therefore, this discussion also explicitly demonstrates the effect of the abductive approach in the final outcome and contributions.

## 6.1 Contributions to knowledge on accelerators

This research contributes to the academic discussion of accelerators by providing initial insights to the understudied topic of accelerators and early internationalisation of startups. This contextualised study led to new insights regarding explanatory mechanisms of early internationalisation through accelerator networks. The conceptual model shows how accelerator networks enable startups to become embedded in the industry context and how international opportunities are developed in an interactive, non-linear, and iterative manner through further networks, resources, and collaboration. A typology of startups differentiates connected and independent startups, which are in different stages of development in terms of international opportunities and product development.

The research started with an extensive review of the early internationalisation of startups. The idea to contact an accelerator came through the need to reach startups, and contacting an accelerator triggered a review of accelerators. The edtech context was selected due to the controversy discussed earlier. It was the first visit to the accelerator and the very first conversation with the programme director that revealed the importance of intentions to the global markets – both from the perspective of the accelerator (selection criteria) and from the point of view of startups (international intentions). Even though the research was in its early stages, with no framework, it appeared surprising that the existing literature does not seem to address the role of an accelerator in early internationalisation although it seemed to play such a crucial role among practitioners. Therefore, going to the field informed by the existing studies led to the very first ‘abductive moment’, which had an impact on the treatment of the accelerator in this study. Instead of a methodological context, it turned out to be part of the research phenomenon and explanation, since there was an obvious gap in the literature.

Thus, the starting point for the research was that there is a research gap in the existing literature regarding accelerators and startup internationalisation. In parallel, an empirical observation regarding the Finnish context of education was a trigger by which to conduct this study. Combining these two observations and focussing on the edtech companies, often small entrepreneurial ventures, led to an in-depth inquiry in the form

of a case study. The focus was on international opportunity development among startups in a Finnish edtech accelerator. The research revealed that the Finnish education brand is a pull factor for international startups to come to Finland for acceleration and therefore, the startups of this study are both of local and non-local origin.

The findings highlighted following key networks: peer startups, corporate partners, mentors, investors, public sector partners for co-creation, and partners for internationalisation. In contrast to prior accelerator studies (e.g., Vandeweghe & Fu, 2018), this study identifies the importance of co-creation and internationalisation partners, which have received less attention in the accelerator literature. The findings indicate how accelerator networks foster international opportunity development in an accelerator. The identified categories are as follows: informal and emergent as well as systematic and organised networks, tangible and intangible resources, and finally, collaboration with pre-determined and open goals. These dimensions were elaborated based on rich empirical data and illustrated by extensive references. The findings show the importance of emergent, unsystematic, and even serendipitous encounters, resonating with prior studies of global technology startups (e.g., Tahvanainen & Steinert, 2013) and recent knowledge of incubators (Busch & Barkema, 2020).

Based on the results of this study, collaboration among startups would be worth giving further attention. The extant studies on accelerators do not stress collaboration; however, the literature on business associations highlights collaboration (Wang & Tan, 2019). The evidence for collaboration in this study may stem from the study context. It is in line with the results from the comparison of startup hubs for the startups in the Helsinki region (Startup Genome, 2018).

The dimensions networks, resources, and collaboration appeared at all levels of organisational contexts: startups, the accelerator, and network partners. The results emphasise the interplay between different actors, whereas prior research (Kabbara, 2016) has identified startup-related and accelerator-related variables influencing the internationalisation of web-based startups in accelerators. The focus on the interplay in this research stems from the theoretical premises of the research. This study considers international opportunities in terms of interactive development instead of focussing on somewhat static view of variables, which do not consider dynamic mutual influence. In other words, to summarise the key assumption of this research, not only are startups influenced by context, but they influence context.



Without the holistic methodological approach adopted in this research, capturing the multiple levels of interaction would have been impossible. The positivist paradigm has been strong in network studies with a strong focus on atomising and measuring the networks (Jack, 2010). However, studies following different philosophical positions such as realist ontology (e.g., Lee & Jones, 2008; McKeever et al., 2015) enrich studies of entrepreneurial networks. This study has attempted to join this tradition.

By providing a typology of the accelerated startups, this study advances knowledge of internationalising startups in accelerators. The typology stresses the parallel developments of startups. The dimensions in the typology are accelerator networks, product development, and international opportunities, defined as exploration versus exploitation, operationalised as foreign market entry. The analysis of startups demonstrates that both so called connected and independent startups may enter foreign markets. Thus, the level of connectedness does not seem crucial for an individual startup. The startups remain outside accelerator networks for various reasons related to their perception of the relevance of networks and the strength of their own prior networks. Further reasons include access to the networks and other practical considerations, along with internal issues or the developmental stage of their ventures. Regarding international and local partners, prior research (Paradkar, Knight, & Hansen, 2015) indicates that startups struggle to find necessary international partners. The accelerated startups of this study express expectations of international contacts. The accelerator has a notable intermediary role, but so do the prior contacts of startups, such as the contacts of the board members of the startups.

The significance of peer-to-peer relationships and support provided by the peers seems to be important even for startups that remain in the outer circle of other accelerator networks. They may be active through their own prior networks, created with major players in the industry. The connection of these startups and accelerator remains mainly at the peer level. Through networking among peers, startups have the opportunity to leverage each other's prior knowledge and networks. Thus, peer networks as a subset of accelerator networks are also an important embedding mechanism.

Overall, the typology shows that the startups in an accelerator are not homogeneous. Therefore, a standardised approach is problematic. The differing needs of the startups require different approaches but the resources of accelerators may set limitations. Networking and peer support among participants within heterogeneous groups may lead

to useful learning experiences. However, tailormade training and coaching enable a sharper focus on the needs of individual startups. In contrast, prior research (Cohen et al., 2019) speaks to a standard approach. The argument is that when startups are free to choose, they do not participate in activities that would prove useful for them.

The typology above would also work as a tool by which research the dynamics of the accelerator time, if it would be in use at several points of time and, thus, to address changing requirements during early-venture development (Sullivan & Ford, 2014). This study took place over a period of 3–12 months after the accelerator programme had ended. This period was selected following the description of the acceleration journey. According to it, startups should start entering foreign markets at approximately that time. During the study, it became clear, however, that startups vary substantially in terms of their readiness to enter the market. On one end are startups that before their time with the accelerator had foreign sales, whereas on the other end are ventures that remain product developers after graduation.

This research strongly supports the idea that the role of an accelerator is that of an intermediary between the startups and partner networks (Goswami et al., 2018). The intermediary role of the accelerator in this study stresses the positive impact on the non-accelerated startups as well. Contrasted with the types of accelerators identified in the existing literature – ecosystem builder, dealflow maker, and welfare stimulator (Pauwels et al., 2016) – the accelerator of this study does not seem to meet completely the criteria of any of these accelerator definitions. Thus, the studied accelerator could be considered a hybrid.

Finally, the edtech context of the accelerator is exhibited in this study, in particular, in the activity of systemising co-creation to acquire a first reference customer at the public–private interface. It was the bottleneck the accelerator had identified and was hindering the international opportunities. For the partners, startup collaboration brings innovation and renewal. From the accelerator's point of view, cumulative knowledge stays in the industry. Referring to the collective level, this study, thus, aligns with the views of recent research that the systemic level of international opportunities and collective international opportunity development is important, in addition to the venture level (Haaja, 2019; Mainela, Puhakka, & Sipola, 2018). Even though not all startups succeed or are able to exploit international opportunities, the whole emerging edtech sector benefits from the connecting role of an accelerator and efforts to build an

ecosystem. Key tenets of this research are that embeddedness is dynamic and that different actors both influence context and are influenced by context. This mutual influence is also highlighted in the conceptual model and throughout the study.

## 6.2 Contributions to international opportunity discussion

In terms of growing discussion related to international opportunities, this study extends knowledge of the ventures when they have international intentions or alternatively are still very early in their internationalisation process. This focus on the very early stage resonates well with the opportunity construct that posits theoretical routes in entrepreneurship and has spread to the international entrepreneurship literature. Stressing the characteristics of startups, this study employs an entrepreneurial lens to the international opportunity discussion and, thus, attempts to add to the international opportunity discussion by showing the micro-level developments of the early-stage ventures with international intentions.

The second ‘abductive moment’ occurred during the field period, as it became evident that the development of learning solutions and acquisition of the first international customers are overlapping processes, and relevant networks in both processes are interrelated. For instance, some of the identified key players, such as public sector partners with whom products are co-created, relate both to venture formation (co-creating products) and to internationalisation (initial customer references for credibility abroad). The empirical data and extant literature made evident that the processes of product development and international opportunities are intertwined. The role of the accelerator in international opportunity development may be understood through consideration of both aspects. That insight led to further literature research, showing the parallel process of venture creation and internationalisation are interlinked. However, at the startup level, there was limited discussion on this link. Combined with the accelerator setting and selected theoretical lens of embeddedness, this insight led to the typology in the analysis. Thus, this research joins the discussion of the parallel process of venture creation and the internationalisation of startups (Stayton & Mangematin, 2016), explicitly addressing the newness of the ventures (Coviello & Tanev, 2017).

Selecting a startup approach also requires to include new product development, a viewpoint missing in international entrepreneurship studies that do not explicitly deal with the startup context. New product development was considered when defining the three dimensions of the typology. As Rasmussen and Tanev (2015) argue, research of born globals rarely discusses new product development and related issues. Those firms are small and medium sized companies that have had international or global operations from the beginning rather than nascent ventures aiming at international markets. Coviello (2015) identifies a need for the re-interpretation of the concept of born-global firms, since the dominant research approach regarding them has dealt with companies that internationalised 20–30 years earlier than the time point of research. Such studies reveal antecedents for the survival of the early internationalisation rather than antecedents for early internationalisation. Thus, that paper recommends investigation of the actions of companies while they are still new.

Above has methodological consequences. This study focusses on early-stage development and supports this focus methodologically by collecting real-time data instead of looking retrospectively at internationalised companies. Hence, this research is inspired by the discussion that has emerged in response to the identified gap in the born global and international new venture literature (Coviello, 2015; Coviello & Tanev, 2017; Rasmussen & Tanev, 2015; Tanev, 2017).

Theoretically this study defines opportunity development as an interactive, iterative and non-linear process (Ardichvili et al., 2003). This viewpoint, combined with network embeddedness, resulted in a dynamic, holistic view differing from the views of earlier studies (Johnson, 2004), which discuss factors enabling startups to internationalise. This study stresses collaboration in addition to resources and networks, which are broadly discussed in the literature of networks and early internationalisation (Coviello & Cox, 2006; Coviello et al., 1997).

Referring to the typology, especially to the group of international independent startups, the findings of this study also emphasise the prior networks of startups as an important starting point for internationalisation. The international entrepreneurship literature emphasises the importance of networks in early internationalisation; the prior networks of the venture play a significant role for the researched startups. As Evers and O'Gorman (2011) argue, the networks at hand are a starting point for internationalisation. The finding that entrepreneurs start with prior networks, which

develop as the company develops, is in line with the starting point of the effectuation logic (Sarasvathy, 2001), according to which the companies start with ‘who I know’, ‘what I know’, and ‘whom I know’. This research shows teams are mostly experienced in their field, and for a significant number of founders, the startup is not their first venture. The use of prior contacts to explore and exploit international opportunities is widespread. As Vasilchenko and Morrish (2011) argue, both social and business networks play a role for technology ventures in international opportunity development. The findings with the startups of this study affirm this position. Hence, there seems to be need and justification to approach internationalising startups in a cross-disciplinary manner, since studies on entrepreneurial networks have focussed on social networks (Ellis, 2011; Slotte-Kock and Coviello, 2010), whereas internationalisation studies are often based on business network viewpoints (Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003).

### 6.3 Contributions to network embeddedness

Network embeddedness was approached from different research traditions and resulted in consideration of networks as embedding mechanisms. The literature review showed differences in the traditions. This research’s contribution to the discussion of embeddedness is related to the treatment of the complexity of spatial context and to alternative viewpoints to internationalisation studies.

The third and final ‘abductive moment’ was related to the treatment of the context. The spatial context in internationalisation studies is usually treated as an industrial or geographical area of the units of analysis. Therefore, at first, this study emphasized the Finnish context in which startups inherently aim at international markets from inception. This idea followed internationalisation studies of companies belonging to the same industry association, for example. These studies usually separate home market context and the target markets as host national context. However, due to the units of analysis, internationally mixed startups in an accelerator, the treatment of the spatial context led to the following insight. The way in which existing studies on internationalisation treat spatial context does not accord with the contextual reality found within this research. Accelerator hosts startups from different national backgrounds and as interaction among startups influences greatly the accelerator

experience, it was not meaningful to limit the inquiry on Finnish startups and leave essential actors influencing the studied phenomenon out of the scope of this study.

The insight described above led to systematic analysis of network embeddedness studies by addressing two questions: ‘Who is embedded in what?’ (Hess, 2004) and ‘what is the role of the context?’ (Welter, Gartner, et al., 2016; Welter, 2011). Differentiating placial and spatial dimensions (Korsgaard et al., 2015) and the notion that network embeddedness is about the connections between the actors regardless of their geographical location (Hess, 2004) would provide a new perspective for the treatment of spatial context in internationalisation studies. Particularly, studying internationalisation in accelerators and similar settings.

Many of the reviewed studies in the field of internationalisation refer to network embeddedness in industry associations or clusters. An international accelerator differs by nature from, for example, industry associations, as it is already an internationally mixed setting. Due to the digital opportunities for virtual participation, it is not even tied to physical presence. Consequently, this insight led to study the concept of context again to realise the lively discussion of the complexity of conceptualising context. At the intersection of entrepreneurship and international entrepreneurship, this study enriches discussion of network embeddedness in entrepreneurship by adding the international element to the early venture discussion. This study discusses how a support mechanism such as an accelerator enables globally mixed startups become embedded in industry context. At the same time, it challenges the somewhat rigid idea of local versus international networks usually used in network embeddedness studies in the fields of international entrepreneurship.

The interdisciplinary approach of this research directed interest in the research traditions of entrepreneurship research and in internationalisation research. The studies of internationalisation usually approach context as a cultural or national environment (Marschan-Piekkari, Welch, Penttinen, Tahvanainen, 2004). In general, studies in the field of entrepreneurship recognise the need for situation specificity and contextualised views, and some studies seek to contextualise entrepreneurship, including studies on rural entrepreneurship (e.g., Gaddefors & Anderson, 2019; Korsgaard et al., 2015; Müller & Korsgaard, 2018), academic entrepreneurship (e.g., Rasmussen, 2011), family entrepreneurship (e.g., Arregle et al., 2015; Leppäaho, Jack, et al., 2018), gendered perspectives of entrepreneurship (e.g., Marlow & Patton, 2005), social entrepreneurship

(e.g., Vannebo & Grande, 2018), and entrepreneurship in emerging economies (e.g., Smallbone, Welter, & Ateljevic, 2014).

The concept of embeddedness is strongly linked with context (Welter, 2011), and one of the key points of emphasis in this research is context as an explanatory factor.

Considering the setting of this study, moreover, it became clear that certain context-related assumptions referring to the ‘spatial dimension’ of context as a country or region did not apply well in practice, which led to reconsideration of the whole concept of context in this study. This study focusses on internationalising edtech ventures and explains how the accelerator networks of a Finnish edtech accelerator enable internationalising startups to become embedded in the emerging industry sector of edtech. The edtech accelerator is located in Finland, yet according to the analysis, it is important to note that actors – both startups and partners – originate from several spatial contexts. The selected startups share the international intentions independent of their home markets.

Thus, due to global relations, the spatial dimension is not restricted to local actors.

During the research, considering Finnish edtech as the context turned out to be too limited for this research. The context for the units of analysis – startups – is the setting of internationally mixed teams in internationally mixed fixed-term cohorts in an accelerator with internationally mixed networks of partnerships which, for a fixed term, share a physical location in Finland. Yet, due to the mode of virtual participation, even that description does not cleanly apply.

The contextualised perspectives in entrepreneurship have increasingly gained conceptual attention (Welter, 2011; Zahra et al., 2014). The definition of context is not a straightforward issue, and this study agrees with Welter et al. (2019), who argue it is too limited a view to restrict contextual discussion to national and industry contexts, which is usual approach. Context – defined, for example, by Welter (2011) as ‘circumstances, conditions, situations, or environments that are external to the respective phenomenon and enable or constrain’ – is always relational, depending on the unit of analysis. Thus, what is a context in one study may be treated as unit of analysis in another study.

However, it is seldom that authors explicitly conceptualise the context or address the difference in substantive or methodological context. Contextual complexity was also one of the key challenges in this research. According to Welter, Gartner, et al. (2016) contexts should be considered in their plurality instead of discretely. They further raise

following question: ‘How do different contexts interact with each other?’ and ‘How do contextualized dimensions interact with other levels of analysis?’ These questions, as well as the insight that actors influence context as much as context influences actors, inspired the formation of the conceptual framework and the later stages of the analysis. Therefore, this research joins the discussion of interplay between multiple levels of contexts and considers that context is fluid, constantly changed by its actors.

By focussing holistically on context, the research extends knowledge of the interplay of emerging startups, emerging accelerator and the emerging edtech sector, and it demonstrates the complexity of defining context simply through the geographical area. The outcome is a conceptual model that highlights the multiple layers of network embeddedness and mechanisms – connecting, peer support, and development – driving the development of international opportunities for startups in the context of edtech. The interactions in the model are not explicitly distinguished as local or international, which is the usual scenario in internationalisation studies. Studying local startups as separate from non-local ones would not accord with the holistic idea of startups influencing the context and being influenced by the context.

#### 6.4 Propositions to advance studies on accelerators

Based on the discussion above and guided by the research questions, theorising from the contextualised single case study within a Finnish edtech accelerator leads to following propositions. Future studies may further address the developed propositions into hypotheses and test them on a larger sample of firms.

Firstly, this research adds to the growing literature on accelerators by extending knowledge on how an accelerator may foster the early internationalisation of startups. This research joins the contextualised entrepreneurship studies (Welter, 2011; Welter & Gartner, 2016) by showing diversity in the accelerator concept, as the findings of the study indicate that the profile and role of an accelerator may be substantially more versatile than offering tools for business development, mentoring, and potential contacts with investors. The first proposition results from the identification of the relevant partner networks of accelerators and adds to the knowledge of accelerators and internationalisation of startups.



*P1: In addition to peer startups, corporate partners, mentors and investors, international opportunity development of edtech startups benefits from public sector partners for co-creation, and partners for internationalisation.*

The importance of different network partners could be further tested by analysing and testing the importance of different network partners for startups in different stages of development.

The objective of the second sub-question of the research focussed on the role of networks in international opportunity development. The analysis revealed several explanatory mechanisms.

*P2: Accelerator networks enhance the international opportunity development of startups through following mechanisms: Systematic and non-systematic networks, tangible and intangible resources, and collaboration with open and pre-defined goals.*

The analysis of startups led to a typology capturing the differences among startups joining an accelerator programme. The development of the learning solution – product or service – was included as a dimension to address the specific features of startups, which go through several parallel development processes.

In the edtech sector, public sector partners with whom products are co-created, relate both to venture formation (co-creating products) and to internationalisation (first customer references for credibility abroad). Combining the finding of co-creation partners and the categories in the typology lead to the following proposition, which distinguishes the role of co-creation partners for startups according to the development stage.

*P3: Edtech startups classified as international opportunity developers and internationals benefit from co-creation opportunities through customer references whereas edtech startups classified as product developers benefit from co-creation in the development of learning solutions.*

The partners benefit from the collaboration with the startups as it supports renewal in their organisations. This proposition serves as a starting point to further research startups in different stages of development, and how they benefit from the co-creation partners. This research enriches the understanding of the parallel process of venture creation and internationalisation (Stayton & Mangematin, 2016) by cross-fertilising knowledge from two different research traditions. The findings show how the relevant

networks in both processes are interrelated and how the change in position from outsider to insider in specific local and international networks leads to international opportunity (Johanson & Vahlne, 2009; Schweizer et al., 2010).

Thus, this study explicitly addresses the newness of the ventures, which has not always been in focus in studies revolving around international new ventures (Coviello & Tanev, 2017). This choice was methodologically supported by collecting real-time data instead of retrospective data. The liability of outsidership is a concept employed in internationalisation studies, and this study applies it in the early-venture development and entrepreneurship. On the other hand, the findings related to the accelerator enhance the discussion of international opportunities and provide initial insights into entrepreneurial internationalisation discourse.

The prior studies on accelerators do not stress collaboration. However, referring to the findings of this study and the second proposition, collaboration plays a significant role in the international opportunity development. The accelerator is an intermediary, which connects edtech startups with international partners. This collaboration with pre-defined goals is beneficial for startups classified as internationals and international opportunity developers in the typology.

*P4: Accelerator connects startups and network partners internationally, which leads to international opportunity development among connected internationals and international opportunity developers.*

The significance of peer-to-peer relationships and support provided by the peers represents another form of collaboration, which is collaboration with open goals. This form of collaboration shows in the opportunities developed through peer startups' knowledge and networks.

*P5: Peer support leads to international opportunity development within internationally mixed accelerator cohorts and in the larger community of accelerated startups, and this support encompasses leveraging each other's prior knowledge and networks in the local and international markets.*

Finally, this research joins the discussion on contextual dimensions in entrepreneurship studies. The spatial dimension of a context is more complex than is geographical location, and geographical location as an operationalisation of a spatial context has shortcomings in addressing the reality of internationally mixed startups located in

various places and embedded in several environments. Therefore, this study strongly suggests internationalisation studies in similar settings to re-consider the spatial dimension.

## 6.5 Implications for practitioners

Having discussed the contributions to knowledge, the discussion moves to the practitioner level. Accelerators started to emerge in the United States (Cohen & Hochberg, 2014) and have expanded to different parts of the world to boost new ventures. Accelerators focussed on industry sectors or in different geographical contexts are not well studied. Hence, this research provides novel information for the accelerator discussion, which also has implications for practitioners. The impacts of the findings are discussed from the point of view of accelerator managers, startups, and people involved in early-stage venture growth.

For accelerator managers, the findings are beneficial in the design and implementation of accelerator programmes and in determining how to support participants of cohorts and alumni communities and further develop the partner networks of accelerators. This study identified key networks in this particular context, along with networks, resources, and collaborations that enable startups to further develop their international opportunities. The combination of these two dimensions provides concrete examples of activities in which the startups may further develop the international opportunities both locally and globally.

Another outcome of this study is the typology of the startups. With minor modifications for practical purposes, the categorisation of startups serves as a basis for an evaluation tool that accelerator management can use when monitoring the development of startups. Furthermore, there is potential with the help of the typology to design more customised support for startups. The request for personalised support was expressed by startups in this research. The research evidence from another study (Cohen et al., 2019), however, is contradictory to the request for more tailored programmes showing the benefits of standardised support. The standardised support is reasoned as follows: flexibility in choosing which modules to attend leads startups to choose fewer modules; hence, they miss their chances for serendipitous insight. There might be explaining factors such as

the level of heterogeneity among the participants or the type of the accelerator. In any case, as this discussion displays, accelerators are versatile, and the needs for customisation might require further study.

Collaboration among cohort startups following the motto ‘sharing is caring’ does not simply emerge. Willingness and openness to support each other and to form a connected community may be enhanced by the accelerator. This study indicates the accelerator may enable peer support during all stages related to cohorts: selection of matching cohorts (pre-programme), activities to enhance group dynamics (programme), and supporting alumni community (post-programme). Prior research (Cohen et al., 2019) has stressed the performance advantages of accelerators that foster transparency. This study evidences that creating transparency requires explicit team building efforts at the cohort level. In an ideal case, the alumni community grows after each cohort has ended. However, maintaining an active alumni community is not easy, and even though various virtual tools enable alumni to be in touch with each other at distance, there is a risk that the alumni community covers only some active members. The more the accelerator absorbs the role of an ecosystem builder, the more the benefits from the accelerator exceed the acceleration programme.

This study suggests having internationalisation on the agenda of the accelerators. This objective requires consideration of how to develop partner networks accordingly and how to purposefully plan activities that enhance networks, resources, and collaboration from the point of view of international opportunity development. International partners are not sufficient. This study stresses the importance of removing the domestic obstacle, that is, the lack of first-reference customers. Solving this problem at the level of all startups – accelerated and non-accelerated – can boost the internationalisation of startups. This finding may be instructive for accelerators in different contexts. It may be transferable to different industries where public sector partnerships play a role. However, at more general level, the finding refers to the fact that the accelerator may enhance the internationalisation of startups by creating meaningful local networks.

Furthermore, internationalisation also refers to the internationalisation of the accelerator. The internationalisation of an accelerator is linked to emerging startup internationalisation in many ways. An accelerator, that can attract foreign startups provides interaction automatically, which may lead to international opportunities for all participants. The success stories are the best reference to attract promising new ventures

globally. The accelerator may also internationalise its own operations and virtual or mixed programmes by combining live and virtual participation. The more advanced the accelerator programme is in terms of its usage of modern technologies, the less that physical presence during the programme plays a role and allows the accelerator to have startups from distant locations without making them to move to the location of the accelerator.

In summary, referring to Figure 15, this study indicates that management of accelerators must focus on connecting the right local and international players with the accelerator and startups. Further goals should be in the area of development at the startup level and sector level and ensuring an environment for startups to support each other mutually.

Finding a suitable accelerator programme is important for startups. Today's world features much hype around startups. Startup entrepreneurs easily lose focus, and finding the balance between reacting to tempting opportunities and managing limited resources is difficult. A variety of different organisations, tools, and mechanisms are available to support startups and are widely recognised as important drivers for renewal and change in this millennium. However, for the interviewees in this study, keeping focus was often a key to success.

Startups and entrepreneurs with intentions to enter global markets may benefit from considering the choice of a suitable accelerator, for example, in terms of choices between general and sector-specific accelerators or the right time to join an accelerator. The accelerator literature catalogues a tendency towards sector-specific accelerators (Mian et al., 2016). According to the findings of this study, a sector-specific accelerator seems to have benefits for startups enabling embeddedness in the relevant networks, which foster early internationalisation.

The typology created in this study could also be modified to a self-reflection tool, which startups can use to identify their current stage of development and set targets for the acceleration programme or post-acceleration period. In addition, it would enable startups to set targets for acceleration time accordingly.

Despite the tendency to define accelerators through the programme, the value of an accelerator is not limited to the programme. Opportunities emerge through the networks, resources, and collaboration beyond the accelerator period. This study also demonstrates that startup entrepreneurs influence the accelerator, and acknowledging

their own role in the multi-layered community may motivate startup entrepreneurs to play a more active role. Through ‘give and take’, it is ultimately possible to gain more benefits.

In addition to accelerator managers and startup ventures, the results of this study are useful for different types of organisations involved in early-stage venture growth. Based on this study’s findings and on insights related to the parallel process of venture creation and internationalisation, this study suggests that in the context of internationalising startups, the activities targeted towards early-stage venture support should integrate support for internationalisation. This suggestion has also implications for policies to support early-stage ventures.

The characteristics of startup ventures which are iteratively developing their venture, product, and business model while exploring and developing international opportunities set specific needs for international development. Therefore, general knowledge of internationalisation, even if it is targeted to small ventures, is not necessarily helpful for startups. Consequently, people and organisations dealing with startups – regardless of their role – must recognise this difference. In addition, they need to recognise that the understanding of the phenomenon remains limited, meaning, for example, a limited number of books for practitioners to consult.

Since accelerators remain relatively unexplored, this study also contributes knowledge on accelerators as important actors in the entrepreneurial ecosystems. The findings are particularly illuminating for anyone interested in the edtech ecosystem. Referring to Figure 13, this study provided an example of an emerging ecosystem based on thick description in a specified context. Understanding the mechanisms that drive international opportunity development and the interactions between startups, accelerators, and sector-specific actors enables the development of practices to support startups. Finally, what is also to be learnt from this case study and what is potentially transferable to other sectors, where public sector customers form an important customer segment, is the role of an accelerator as a trigger to develop a public–private partnership model. This role applies to especially accelerators that identify themselves as intermediaries in entrepreneurial ecosystems.

## 6.6 Limitations of the study

As with any study, this study has limitations. Even though it provides detailed and in-depth information on the role of an accelerator in the early development of internationalising startups, the results provide only an extract of the early development during a limited period. Through the case of international opportunity development in the studied context, this research illuminates the role of accelerator networks for internationalising startups. It also highlights how accelerator's impact may vary among startups. However, this research does not include data regarding later development several years after the accelerator programme. By prolonging the research period to several years, there would have been an option to look at the outcome, whether the startups were able to build up sustainable businesses. The question that naturally emerges when reading this study is as follows: What happened to them subsequently? The outcome of the long-term development is not known based on this research.

However, this is due to a conscious choice since outcome-oriented research usually neither deals with in-depth information nor answers the question of 'how'. Rather than trying to discern whether they were in the end successful, this research attempts to highlight the underlying mechanisms that enable startups with international intentions to become embedded in the relevant networks and to explore international opportunities. The setting of the study also enables to view the origins of the emergence of a community where knowledge transfer takes place. A clear choice in this study is to focus on the very early period of startups that go to an accelerator programme, with the wish to make international contacts and discover further investments. The results of the study also show the multitude of effects that accelerator time may have on startups. In addition, it highlights the versatile role of an accelerator. By collecting field data actively for two years and being able to observe the early development of the accelerator for three years, this study contains the temporal element though since embeddedness is not a static phenomenon (Halinen & Törnroos, 1998; Johannisson et al., 2002).

Furthermore, although this study refers at several points to context specificity, the use of theoretical constructs on international opportunities are partly developed in studies that represent different types of entrepreneurial context, not necessarily a startup context. The context refers to all levels, theory, empirical findings, and methodology but this

study, like most studies, has been compromising in its use of such constructs, which have been developed in different kinds of setting and which might for that reason be legitimately criticised.

Finally, there are also arguments to consider the design of a single case study as a limitation or an asset. The choice between multiple and single case studies is a choice between breadth (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 1994) and depth (Dyer & Wilkins, 1991; Flyvbjerg, 2006; Gummesson, 2007; Ragin, 1992).

Nevertheless, this single case study provides rich, in-depth insights on the emerging internationalisation of startups in an emerging sector. The findings may be transferable to other industrial and national contexts.

## 6.7 Suggestions for further research

The landscape of accelerators offers still a wide avenue of interesting research topics. Startups have been a buzzword since the turn of the millennium, and the startup scene has attracted a great deal of attention. The critical voices are sceptical of the emphasis on startups, but startups are drivers of economic renewal and change, and connected regional startup hubs play an important role in that change. The hype might be needed to draw attention to startups but the efforts to build long-term sustainable success stories require actions at system level. For individual startups the reality is often to struggle under the pressure of finding further funding. The hype may even be irritating for some while trying to keep their focus. Accelerators have emerged with the rise of startups. Due to the novelty of the phenomenon, many areas could be further studied. The challenges raised by European Accelerator Summit (2016), that is, the selection of quality startups and the financial sustainability are areas worth further research inquiries.

Due to the selected focus of this study, relevant accelerator activities such as general business development and financial resources were given limited attention in this study. Therefore, it is recommendable to undertake an accelerator study on the internationalisation of startups, which would focus solely on the financial resources or general business development of startups.

As was discussed in the contributions section, collaboration between startups, as well as between startups and relevant partners, was among the elements driving their early



development both in terms of products and foreign markets. The key assumption in this study was that networks have a role in turning the liability of outsidership to insidership. This study revealed in one industry context how accelerator networks enable startups to embed themselves in relevant sector-specific networks.

One suggestion would be to run a comparative study at a national level or between different industry sectors to highlight whether the findings of this in-depth study in one geographical and industrial context are applicable to accelerators in other contexts. Moreover, it would be of interest to focus on the accelerator as a unit of analysis or on specific types of relationships, for example, among startups and peers or startups and partners. Studying relationship development over time would also provide considerable insight and correspond with the processual nature of internationalisation and entrepreneurship. Another alternative unit of analysis would be the entrepreneurs. This choice would be methodologically supported by collecting self-reported data from the entrepreneurs (Chlosta, 2016) to have endogenous views from the entrepreneurs upon the role of accelerator networks and their early internationalisation.

The typology created in this study (Figure 14) could be used to examine internationalising startups and to position accelerated startups in the framework based on several rounds of temporarily dispersed data-collection points to highlight the developmental curve of each startup. Such a longitudinal research design would enable the analysis of the long-term impact of an accelerator on the survival of the startups that have been in the accelerator. Referring to the cut-off point of six years for young ventures (Brush & Vanderwerf, 1992; Zahra et al., 2000), the follow-up rounds could cover ventures that have been in the accelerator cohorts and reached six years of age.

Finally, a specific feature of the edtech community in Finland, based on this study, is willingness and ability to share and collaborate. Likewise, there is evidence of a high level of local connectedness (Startup Genome, 2018) in the Helsinki startup ecosystem. However, there are gaps in current knowledge regarding the question of what makes a startup community connected and collaborative. Remarkably, competition among startups did not appear to be an issue for startups in this study, yet there is opposite evidence from other accelerator studies (Cohen et al., 2019). The aspect of collaboration versus competition would also deserve further examination.

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## Appendices

### Appendix 1: Interview questions for different groups of respondents in English and in Finnish

#### 1a Interview questions for startups

Company background info / *Taustatiedot yrityksistä*

Turnover / *Liikevaihto* / Employees / *henkilöstö* / International sales / *myynti ulkomaille*

Would you please briefly tell about your professional background (previous jobs, educational background)? / *Kerrotko lyhyesti taustastasi (työtausta, koulutuksellinen tausta)*

Would you please tell the story of your company? / *Kerrotko yrityksenne tarinan?*

There are three categories of questions: (1) accelerator related, (2) education technology related & (3) questions related to international opportunities. / *Haastattelussa on kolmenlaisia kysymyksiä (1) kiihdyttämöön liittyviä (2) koulutusteknologiaan liittyviä ja (3) kansainvälisiin mahdollisuuksiin liittyviä*

#### ACCELERATOR / KIIHDYTTÄMÖ

pre-accelerator / *ennen kiihdyttämöä*

How did you hear about the accelerator? / *Miten kuulit kiihdyttämöstä?*

Why did you choose to apply for the accelerator programme? / *Miksi päätitte hakeutua kiihdyttämön ohjelmaan?*

Were there any significant milestones in terms internationalisation before the time in the accelerator? (joint product development, international funding, sales, international recruitments) / *Oliko teillä joitain merkittäviä kansainvälistymiseen liittyviä tapahtumia ennen kiihdyttämön aikaa? (tuotekehitys, kansainvälinen rahoitus, myynti, kansainvälinen rekrytointi)*

Accelerator time / *Kiihdyttämöaika*

What is the programme like? / *Millainen kiihdyttämön ohjelma oli?*

What were the major benefits for you? / *Mitkä olivat suurimmat hyödyt kannaltanne?*

How do you see the role of accelerator for the edtech startups? / *Miten näet kiihdyttämön roolin edtech startupien kannalta?*

Were there any significant milestones in terms of internationalisation during the time in the accelerator? / *Oliko teillä joitain merkittäviä kansainvälistymiseen liittyviä tapahtumia kiihdyttämöjakson aikana?*

How would you describe the position of the accelerator among other accelerators? / *Kuvaile kiihdyttämön asemaa muiden kiihdyttämöiden joukossa.*

Post-accelerator period / *kiihdyttämön jälkeinen aika*

What is your connection to the accelerator since the accelerator period? / *Mitkä ovat yhteytenne kiihdyttämöön alumnina?*

Do you have peer support? / *Vertaistuki?*

Were there any significant milestones in terms of internationalisation after the time in the accelerator? / *Onko teillä joitain merkittäviä kansainvälistymiseen liittyviä tapahtumia kiihdyttämöjakson jälkeen?*

## EDUCATION TECHNOLOGY / *KOULUTUSTEKNOLOGIA*

How would you characterise the field of education in general? / *Millainen on koulutus toimialana yleisesti?*

How would you characterise the educational institutions in terms of adopting innovations? How are the decision-making processes? / *Millaisia ovat oppilaitokset innovaatioiden omaksujina? Millaisia ovat päätöksentekoprosessit?*

What are strengths of the Finnish education know-how? Weaknesses? / *Mitkä ovat suomalaisen koulutusosaamisen vahvuudet? Heikkoudet?*

How do you see the commercial potential of the Finnish education know-how? / *Millaisena näet suomalaisen koulutusosaamisen kaupallisen potentiaalin?*

How do you see the attempts to enhance export of education in the Finnish context? / *Miten näet suomalaisen koulutusosaamisen vientiponnistelut?*

How do you see Finland as an operational environment for startups? / *Millaisena näet Suomen toimintaympäristön startupien kannalta?*

How do you see the startups in this field (edtech and learning solutions)? / *Millaisia ovat startupit koulutusteknolgiaan ja oppimiskäytäntöjen alueella?*

How do you see your own strengths and weaknesses as an education technology company? / *Miten näet omat heikkoutenne ja vahvuutenne edtech yrityksenä?*

## INTERNATIONAL OPPORTUNITIES / *KANSAINVÄLISET MAHDOLLISUUDET*

How do you see the role of the accelerator in the development of international opportunities for education technology startups? / *Mikä on kiihdyttäjän rooli edtech yritysten kansainvälisten mahdollisuuksien luonnissa?*

What kind of international opportunities? / *Millaisia kansainvälisiä mahdollisuuksia?*

... in terms of product development? / *tuotekehitys?*

... in terms of foreign funding? / *rahoitukselliset?*

... other resources? / *muut resurssit?*

... in terms of sales? / *myynti?*

... through incoming startups? / *kiihdyttämään tulevat ulkomaiset startupit*

Where do you see your company after 12 months? / *Missä näet yrityksesi olevan 12 kuukauden kuluttua?*

Where do you see your company after 12 months in terms of internationalisation? / *Missä näet yrityksesi olevan 12 kuukauden kuluttua kansainvälistymisen suhteen?*

Is there anything else you would like to point out at this stage? / *Onko jotain muuta, mitä haluaisit lisätä tässä vaiheessa?*



## 1b Interview questions for accelerator management

Would you please briefly tell about your background? What did you do before joining the accelerator? / *Kerrotko lyhyesti taustastasi. Mitä teit ennen kiihdyttämöä?*

ACCELERATOR/KIIHDYTTÄMÖ

Please describe the accelerator model. / *Kerro kiihdyttämömallista.*

What is the strategic focus? / *Mikä on strateginen painopistealue?*

... industrial? / *Toimiala?*

... geographical? / *maantieteellinen?*

What is the funding structure? / *Mikä on rahoitusrakenne?*

Investor or corporate or public funding? Other revenues? / *Sijoittajarahaus? Yritysrahoitus? Julkinen rahoitus? Muu?*

How is the selection process? / *Millainen on startupien valintaprosessi?*

Online open call? / *Avoin online haku?*

Use of externals for screening? / *Ulkopuolisten käyttö arvioinnissa?*

Team as primary selection criterion? / *Tiimi pääasiallisena valintakriteerinä?*

What is the programme like? / *Millainen on kiihdyttämön ohjelma?*

Mentoring services? / *Mentorointipalvelut?*

Training programme? / *Koulutusohjelma?*

Counselling services (by accelerator management team)? / *Ohjauspalvelut (kiihdyttämön johdon taholta)?*

Demo days? Investor days? / *Demopäivät? Sijoittajapäivät?*

Location services? *Tilapalvelut?* Peer-to-peer learning and collaboration? / *Vertaisoppiminen ja yhteistyö?*

Investment opportunities? / *Sijoitusmahdollisuudet?*

How are the alumni relations? / *Millaista on alumnisuhteiden hoito?*

Alumni network? Post programme support? / *Alumniverkosto? Ohjelman jälkeinen tuki?*

Did you benchmark accelerators when creating accelerator model? / *Teittekö vertailevaa benchmarkingia luodessanne kiihdyttämön toimintamallia?*

How would you describe the position of the accelerator among other accelerators? / *Kuvaile kiihdyttämön asemaa muiden kiihdyttämöiden joukossa.*

Are you satisfied with the amount of publicity and awareness among major stakeholders? / *Oletko tyytyväinen kiihdyttämön saamaan julkisuuteen ja tietoisuuteen tärkeimpien sidosryhmien parissa?*

What have you learnt during the past cohorts? / *Mitä olet oppinut aikaisempien ohjelmien kautta?*

What are the improvement needs of the accelerator programme? / *Mitkä ovat kiihdyttämön kehittämistarpeet?*

How would you further develop the model? / *Miten kehittäisit mallia eteenpäin?*

## EDUCATION TECHNOLOGY / *KOULUTUSTEKNOLOGIA*

How would you characterise the field of education in general? / *Millainen on koulutus toimialana yleisesti?*

How would you characterise the educational institutions in terms of adopting innovations? How are the decision making processes? / *Millaisia ovat oppilaitokset innovaatioiden omaksujina? Millaisia ovat päätöksentekoprosessit?*

What are strengths of the Finnish education know-how? Weaknesses? / *Mitkä ovat suomalaisen koulutusosaamisen vahvuudet? Heikkoudet?*

How do you see the commercial potential of the Finnish education know-how? / *Millaisena näet suomalaisen koulutusosaamisen kaupallisen potentiaalin?*

How do you see the attempts to enhance export of education in the Finnish context? / *Miten näet suomalaisen koulutusosaamisen vientiponnistelut?*

How do you see Finland as operational environment for startups? / *Millaisena näet Suomen toimintaympäristön startupien kannalta?*

How do you see the startups in this field (edtech and learning solutions)? / *Millaisia ovat startupit koulutusteknolgian ja oppimiskäytäntöjen alueella?*

## INTERNATIONAL OPPORTUNITIES / *KANSAINVÄLISET MAHDOLLISUUDET*

How do you see the role of accelerator in the development of international opportunities for education technology startups? / *Mikä on kiihdyttäjän rooli edtech yritysten kansainvälisten mahdollisuuksien luonnissa?*

What kind of international opportunities there are for startups? / *Millaisia kansainvälisiä mahdollisuuksia startuppeille?*

... in terms of product development? / *tuotekehitys?*

... in terms of foreign funding? / *rahoitukselliset?*

... other resources? / *muut resurssit?*

... in terms of sales? / *myynti?*

... through incoming startups? / *kiihdyttämään tulevat ulkomaiset startupit*

Please give an example of an international opportunity development for a startup that has been in your program. What happened? / *Kerro esimerkki kansainvälistymismahdollisuuden kehittämisestä jonkun startupin kohdalla, joka on ollut ohjelmassanne?*

How do you see the internationalisation of the accelerator itself? / *Millaisena näet itse kiihdyttäjän kansainvälistymisen?*

Is there anything else you would like to point out at this stage? / *Onko jotain muuta, mitä haluaisit lisätä tässä vaiheessa?*

### 1c Interview questions for public sector partners

Would you please briefly tell about your background? Who are you and what do you do? / *Kerrotko lyhyesti taustastasi? Kuka olet ja mitä teet?*

## COLLABORATION WITH THE ACCELERATOR / *YHTEISTYÖ YRITYSKIIHDYTTÄMÖN KANSSA*

Would you please tell about your collaboration with the accelerator? / *Kerrotko yhteistyöstänne kiihdyttämön kanssa?*

How did it start and how has it evolved? / *Miten se sai alkunsa ja miten se on kehittynyt?*

Why do you wish to collaborate with edtech startups? / *Miksi haluatte olla mukana juuri koulutusteknologian startupien parissa?*

How do you consider the opportunities of edtech from the school's perspective? / *Millaisia mahdollisuuksia näet koulutusteknologiassa koulujen kannalta?*

Are there any challenges related to co-creation? / *Liittyykö yhteiskehittämiseen huonoja puolia tai vaikeuksia?*

How do you measure or monitor the impact of co-creation? / *Miten yhteiskehittämisen vaikuttavuutta mitataan tai seurataan?*

How would you further develop the model? / *Miten kehittäisit mallia eteenpäin?*

How do schools consider co-creation with startups? What about teachers, children and parents? / *Miten kouluissa on otettu vastaan yhteiskehittäminen startupien kanssa? Entä opettajat, lapset, vanhemmat?*

How is the cultural change to bring startup ventures to schools? / *Millainen kulttuurin muutos on ollut tuoda startup yritykset kouluihin?*

How is the future school? How is the role of education technology? Is it important for Espoo to be a forerunner? / *Millainen on tulevaisuuden koulu? Millaista roolia näet koulutusteknologialla? Onko Espoolelle tärkeää olla edelläkävijänä?*

Do you think that co-creation will continue to grow in Finland or internationally? / *Uskotteko yhteiskehittämisen leviämiseen laajemmin Suomessa tai kansainvälisesti?*

In addition to KYKY model, do you have any other forms of collaboration with startups or accelerator? / *KYKY mallin lisäksi, onko teillä muita yhteistyön muotoja startupien tai yrityskiihdyttämön kanssa?*

How well do schools know the opportunities of co-creation? / *Kuinka hyvin yhteiskehittämisen mahdollisuudet tunnetaan?*

How are the further step of co-creation such as piloting and digital experiments? / *Miten yhteiskehittämisen seuraavat vaiheet pilotointi ja digikokeilu?*

What have you learnt from the partnership with the accelerator? / *Mitä kumpanuus yrityskiihdyttämön kanssa on tuonut / opettanut?*

How do you think the collaboration will develop during the next 12 months? / *Mihin uskotte yhteistyön kehittyvän seuravan 12 kuukauden aikana?*

Anything else? / *Onko jotain muuta tärkeää?*

### 1d Interview questions for mentors

Would you please briefly tell about your professional background (previous jobs, educational background)? / *Kerrotko lyhyesti taustastasi (työtausta, koulutuksellinen tausta)*

What is the story of your current company? / *Kerrotko yrityksenne tarinan?*

Please tell about your collaboration with the accelerator. / *Kerrotko yhteistyöstänne kiihdyttämön kanssa.*

How did your collaboration with the accelerator start? / *Miten yhteistyö kiihdyttämön kanssa sai alkunsa?*

Please tell about the collaboration with the startups in the accelerator. / *Kerrotko yhteistyöstänne kiihdyttämän startupien kanssa?*

How do you see the role of the accelerator for the edtech startups? Strengths and weaknesses? / *Millainen on kiihdyttämön rooli edtech startupuille? Vahvuudet ja heikkoudet?*

How do you see the role of the accelerator in internationalising the startups? / *Millaisena näet kiihdyttämän roolin startupien kansainvälistymisessä?*

What are strengths and weaknesses of the accelerated startups? / *Millaisia ovat kiihdyttämön startupien vahvuudet ja heikkoudet?*

Please name companies in which you find the most potential. / *Nimeä mielestäsi potentiaalisimmat startupit.*

How is the education and edtech industry for startups? / *Millainen on koulutusala ja koulutusteknologia startupuille?*

How do you see the brand value co-created with the Finnish schools? / *Millaisena pidät brandiarvoa yhteiskehitetty suomalaisten koulujen kanssa?*

What are the key players in the local and international networks in terms of internationalisation? / *Mitkä ovat keskeiset paikalliset ja kansainväliset verkostot liittyen kansainvälistymiseen?*

Where do you see the accelerator and the ecosystem in 12 months? / *Missä näet kiihdyttämön ja ekosysteemin olevan 12 kuukauden kuluttua?*

Is there anything else you would like to point out at this stage? / *Muuta, mitä haluaisit tuoda esille tässä vaiheessa?*

## 1e Interview questions for investors

Would you please briefly tell about your background? / *Kertoisitko lyhyesti oman taustasi?*

What is the story of your current company? / *Kerrotko yrityksenne tarinan?*

How is edtech from the perspective of an investor? / *Millainen koulutusteknologia on sijoittajan näkökulmasta?*

How is your collaboration with the accelerator? / *Kertoisitko yhteistyöstäsi kiihdyttämön kanssa?*

How do you see the role of the accelerator for Finnish edtech startups? / *Millaisena näet kiihdyttämön roolin suomalaisten koulutusteknologian startupien kannalta?*

How do you see the role of the accelerator for the internationalisation of Finnish edtech startups? / *Millaisena näet kiihdyttämön roolin suomalaisten koulutusteknologian startupien kansainvälistymisen kannalta?*

How do you collaborate with startups? / *Millaista yhteistyötä teette startupien kanssa?*

What are the strengths and weaknesses of Finnish edtech startups? / *Mitkä ovat suomalaisten koulutusteknologian startupien haasteet ja vahvuudet?*

How do you consider edtech startups in terms of internationalisation? / *Millaisena näet koulutusteknologian startupit kansainvälistymistä ajatellen?*

Does the Finnish brand have additional value? / *Onko suomalaisella brandilla mielestäsi lisäarvoa?*

What are the key actors in your network? / *Mitkä toimijat ovat keskeisimpiä omissa verkostoissanne?*

Where do you see company in 12 months? / *Missä näet yrityksenne 12 kuukauden kuluttua?*

Is there anything else that you would like to add? / *Onko jotain muuta jota haluaisit vielä lisätä?*

#### 1f Interview questions for internationalisation partners

Would you please briefly tell about your professional background (previous jobs, educational background)? / *Kertoisitko ammatillisesta taustastasi (aiemmat työt, koulutus)*

Would you please provide some background information about your company? Would you please tell the story of your company? / *Annatko hieman taustatietoa yrityksestäsi? Kerrotko yrityksesi tarinan?*

There are three categories of questions: (1) accelerator related, (2) education technology related & (3) questions related to international opportunities. / *Haastattelussa on kolmenlaisia kysymyksiä (1) kiihdyttämöön liittyviä (2) koulutusteknologiaan liittyviä ja (3) kansainvälisiin mahdollisuuksiin liittyviä*

#### ACCELERATOR / KIIHDYTTÄMÖ

Please tell about your collaboration with the accelerator. / *Kertoisitko yhteistyöstäsi kiihdyttämön kanssa?*

How did your collaboration with the accelerator start? / *Miten yhteistyö alkoi?*

How do you find the accelerator in terms of. . . / *Millaisena pidät kiihdyttämön*

. . . strategic focus? / *strategista painopistealuetta*

. . . selection of startups? / *startupien valintaa*

. . . funding? / *rahoitusta*

. . . programme? / *ohjelmaa*

. . . alumni network? / *alumniverkostoa*

How do you see the role of the accelerator for the edtech startups? Strengths and weaknesses? / *Millaisena näet kiihdyttämön roolin koulutusteknologian startupien kannalta? Vahvuudet ja heikkouedet?*

#### EDUCATION TECHNOLOGY / KOULUTUSTEKNOLOGIA

What are strengths of the Finnish education know-how? Weaknesses? / *Mitkä ovat suomalaisen koulutusosaamisen vahvuudet? Entä heikkoudet?*

How do you see the commercial potential of the Finnish education know-how? / *Millaisena näet suomalaisen koulutusosaamisen kaupallisen potentiaalin?*

How do you see the attempts to enhance export of education in the Finnish context? / *Millaisena näet yritykset koulutusvientiin suomalaisessa kontekstissa?*

How do you see Finland as an operational environment for startups? / *Millainen Suomi on startupien toimintaympäristönä?*

How do you see the startups in this field (edtech and learning solutions)? / *Millaisena näet startupit täällä sektorilla (koulutusteknologia ja oppimiskäisut)*

#### INTERNATIONAL OPPORTUNITIES / KANSAINVÄLISET MAHDOLLISUUDET

How do you see the internationalisation efforts of the startups in the accelerator? / *Millaisina näet kansainvälistymisponnistelut kiihdyttämön startupien parissa?*

How do you see the role of the accelerator in the development of international opportunities for education technology startups? / *Millaisena näet kiihdyttämön roolin startupien kansainvälisten mahdollisuuksien kannalta?*

Where do you see your company after 12 months? / *Missä näet yrityksesi 12 kuukauden kuluttua?*

Where do you see the accelerator and the ecosystem in 12 months? / *Missä näet kiihdyttämön ja ekosysteemin 12 kuukauden kuluttua?*

Is there anything else you would like to point out at this stage? / *Onko jotain muuta, mitä haluaisit lisätä?*

#### 1g Interview questions for other startups in the industry

Would you please tell about your background? / *Kertoisitko lyhyesti oman taustasi?*

How about your company? What is the story? / *Kertoisitko sitten yrityksestänne? Miten se syntyi?*

Would you please tell about your collaboration with the accelerator? / *Kertoisitko yhteistyöstänne kiihdyttämön kanssa?*

How do you see the role of the accelerator for Finnish edtech startups? / *Millaisena näette kiihdyttämön roolin suomalaisten koulutusteknologian startupien kannalta?*

How do you see the role of the accelerator for the internationalisation of Finnish edtech startups? / *Millaisena näet kiihdyttämön roolin suomalaisten koulutusteknologian startupien kansainvälistymisen kannalta?*

How is your collaboration with startups? / *Millaista yhteistyötä teette startupien kanssa?*

What are the challenges and strengths of Finnish edtech startups? / *Mitkä ovat suomalaisten koulutusteknologian startupien haasteet ja vahvuudet?*

How do you consider the edtech startups in terms of international markets? / *Millaisena näet koulutusteknologian startupit kansainvälistymistä ajatellen?*

How is the outlook for the internationalisation of your own venture? / *Millaisia mahdollisuuksia näette oman yrityksenne kansainvälistymiselle?*

Do you consider the Finnish brand has added value? / *Onko suomalaisella brandilla mielestäsi lisäarvoa?*

What are the key actors in your network? / *Mitkä toimijat ovat keskeisimpiä omissa verkostoissanne?*

Where do you see your venture in 12 months? / *Missä näet yrityksenne 12 kuukauden kuluttua?*

Is there anything else that you would like to add? / *Onko jotain muuta, jota haluaisit vielä lisätä?*

## 1h Interview questions for corporate partners

Would you please briefly tell about your background? / *Kerrotko lyhyesti taustastasi. Kuka olet ja mitä teet?*

### ACCELERATOR / KIIHDYTTÄMÖ

Would you please tell about the collaboration between your company and the accelerator? / *Kerro yrityksesi yhteistyöstä kiihdyttämön kanssa?*

How did it start and how has it evolved? / *Miten se sai alkunsa ja miten se on kehittynyt?*

What is your role with startups? / *Minkälainen rooli teillä on kiihdyttämössä olevien koulutusteknologian startupien parissa?*

Why do you wish to be involved in edtech startup scene? How is the edtech sector? / *Miksi haluatte olla mukana juuri koulutusteknologian startupien parissa? Millainen koulutusteknologia on toimialana?*

How is Finland as a location for edtech startups? How would you describe the attractiveness of the accelerator for non-local startups? / *Millainen asemapaikka Suomi on koulutusteknologian startupeille? Miten näette kiihdyttämön houkuttelevuuden kansainvälisille startupeille?*

How is the funding of the accelerator? / *Miten näette kiihdyttämön rahoituspohjan?*

Do you take part in the selection process of startups? How is the quality of startups from your perspective? / *Osallistutteko startupien valintaprosessiin? Millaisena pidätte kiihdyttämöön tulevien startupien laatua?*

How is the programme? What is your role during the programme? / *Millainen on kiihdyttämön ohjelma? Millainen on teidän roolinne kiihdyttämöohjelmassa?*

Mentoring services? Training? Demodays? Investment opportunities? / *Mentorointipalvelut? Koulutusohjelma? Demopäivät? Sijoittajapäivät? Sijoitusmahdollisuudet?*

Are you involved in alumni network? / *Oletteko tekemisissä kiihdyttämön alumniverkoston kanssa?*

Please describe the accelerator among other accelerators. / *Kuvaile kiihdyttämön asemaa muiden kiihdyttämöiden joukossa.*

Are you satisfied with the publicity of the accelerator and recognition among key stakeholders? / *Oletko tyytyväinen kiihdyttämön saamaan julkisuuteen ja tietoisuuteen tärkeimpien sidosryhmien parissa?*

What have you learnt from the collaboration with former cohorts? / *Mitä olette oppineet yhteistyöstä aiempien ohjelmien kautta?*

What are the development needs of the accelerator? How would you further develop the accelerator? / *Mitkä ovat kiihdyttämön kehittämistarpeet? Miten kehittäisit mallia eteenpäin?*

### EDTECH / KOULUTUSTEKNOLOGIA

How are the customers, in other words educational institutions, in terms of innovation? / *Millaisia koulutusalan asiakkaat eli oppilaitokset ovat innovaatioiden omaksujina?*

How do you see the future of innovation in edtech? / *Mitkä näet koulutusinnovaatioiden tulevaisuuden?*

How do you see the export market for Finnish edtech products? / *Miten näet suomalaisen koulutusinnovaatioiden vientiponnistelut?*

#### INTERNATIONAL OPPORTUNITIES / *KANSAINVÄLISET MAHDOLLISUUDET*

How do you see the international opportunities for startups? *Miten näet kiihdyttämön startupien kansainväliset mahdollisuudet?*

Please give an example of the development of an innovation or internationalisation regarding any of the startups that you have collaborated with. *Kerro jokin esimerkki innovaation tai kansainvälistymismahdollisuuden kehittymisestä jonkun startupin kohdalla, joka on tehnyt yhteistyötä kanssanne.*

How do you see the internationalisation of the accelerator? / *Millaisena näet itse kiihdyttämön kansainvälistymisen?*

Where do you think the edtech ecosystem is going to be in 12 months? / *Missä uskotte koulutusteknologian startup ekosysteemin olevan 12 kuukauden kuluttua?*

#### Appendix 2: Participant info sheet and consent form in English and in Finnish

##### **PARTICIPATION INFORMATION SHEET**

Research Project - The Role of Accelerators in Developing International Opportunities:  
Case study of Education Technology Startups in the Finnish Context

Researcher(s): Anette Kairikko

Supervisor: Dr Spinder Dhaliwal, Director of Postgraduate Programmes, Reader in Entrepreneurship, University of Westminster, London

Dr Luca Cacciolatti, Senior Lecturer in Marketing, University of Westminster, London

You are being invited to be part of a research, which studies entrepreneurial internationalisation. The research is being undertaken as a part of Anette Kairikko's PhD studies in University of Westminster London. The research data are utilised in dissertation, journal articles and presentations. The data are gathered through interviews, discussions, observation and documents.

##### **Please note:**

- Your participation in this research is entirely voluntary.
- You have the right to withdraw at any time without giving a reason.
- You have the right to ask for data to which you have an association to be withdrawn as long as this is practical, and for personal information to be destroyed.



- You do not have to answer particular questions either on questionnaires or in interviews if you do not wish to do so.
- Your interview and responses will be made anonymous. However the use of identification of role or title will be mentioned. Individual identities will be kept confidential unless you provide explicit consent to do otherwise.
- No individuals should be identifiable from any collated data, written report of the research, or any publications/presentations arising from it.
- All computer data files will be encrypted and password protected. The researcher will keep files in a secure place and will comply with the requirements of the Data Protection Act.
- All hard copy documents, e.g. consent forms, completed questionnaires, etc. will be kept securely and in a locked cupboard, wherever possible on University premises. Documents may be scanned and stored electronically. This may be done to enable secure transmission of data to the university's secure computer systems.
- If you wish you, can receive information on the results of the research. Please indicate on the consent form if you would like to receive this information.
- The researcher can be contacted during and after participation by email [anette.kairikko@haaga-helia.fi](mailto:anette.kairikko@haaga-helia.fi) or by telephone 040 543 2495
- If you have a complaint about this research project you can contact the supervisor [s.dhaiwal1@westminster.ac.uk](mailto:s.dhaiwal1@westminster.ac.uk)

## PARTICIPANT CONSENT FORM

### Title of Study:

The Role of Accelerators in Developing International Opportunities: Case study of Education Technology Startups in the Finnish Context

**Lead researcher:** Anette Kairikko

I have been given the Participation Information Sheet and/or had its contents explained to me. Yes ☐ No ☐

I have had an opportunity to ask any questions about the intentions of the study and I am satisfied with the answers given. Yes ☐ No ☐

I understand I have a right to withdraw from the research at any time and I do not have to provide a reason. Yes ☐ No ☐

I understand that if I withdraw from the research any data included in the results will be removed if that is practicable (I understand that once anonymised data has been collated into other datasets it may not be possible to remove that data). Yes ☐ No ☐

I would like to receive information relating to the results from this study. Yes ☐ No ☐

I wish to receive a copy of this Consent form. Yes ☐ No ☐

I confirm I am willing to be a participant in the above research study. Yes ☐ No ☐

I note the data collected, (which will be fully anonymised) may be retained in an archive and I am happy for my data to be reused as part of future research activities. Yes ☐ No ☐

**Participant's Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:**

This consent form will be stored separately from any data you provide so that your responses remain anonymous.

\_\_\_\_\_  
I confirm I have provided a copy of the Participant Information Sheet approved by the Research Ethics Committee to the participant and fully explained its contents. I have given the participant an opportunity to ask questions, which have been answered.

**Researcher's Name:** Anette Kairikko

**Signature:** \_\_\_\_\_

**Date:**

Participant info sheet and consent form in Finnish

**Tiedote tutkimukseen osallistujalle**

**Tutkimusprojekti** – Yrityskiihdyttämön rooli kansainvälistymismahdollisuuksien luomisessa – tapaustutkimus koulutusteknologian startupeista suomalaisessa kontekstissa

Tutkija: Anette Kairikko

Ohjaajat: Dr Spinder Dhaliwal, Director of Postgraduate Programmes, Reader in Entrepreneurship, University of Westminster, London

Dr Luca Cacciolatti, Senior lecturer in Marketing, University of Westminster, London

Sinua on pyydetty mukaan tutkimukseen, joka selvittää digitaalisia oppimiskäytäntöjä ja tuottavien yritysten kansainvälistymistä. Tutkimus on osa Anette Kairikon väitöskirjatyötä, jota hän tekee University of Westminsterissä Lontoossa. Tutkimusaineistoa hyödynnetään väitöskirjassa, tutkimusartikkeleissa ja esityksissä. Tiedonhankintaa tehdään mm. haastattelujen, keskustelujen, havainnoinnin ja dokumenttien avulla.

**Huomioitavaa:**

- Osallistumisesi tutkimukseen on täysin vapaaehtoista.
- Sinulla on oikeus keskeyttää osallistuminen tutkimukseen milloin tahansa ilman erillistä syytä.
- Sinulla on oikeus pyytää sinua koskevan tutkimustiedon tuhoamista ja poistamista tutkimusaineistosta, mikäli se on mahdollista.
- Voit kieltäytyä vastaamasta mihin tahansa kysymykseen haastattelun aikana.
- Haastattelussa esille tulleet asiat raportoidaan tutkimusjulkaisuissa tavalla, jossa tutkittavia tai muita haastattelussa mainittuja yksittäisiä henkilöitä ei voida välittömästi tunnistaa. Rooli ja asema yrityksessä tullaan kuitenkin mainitsemaan. Haastateltavien nimiä ei mainita, ellei haastateltava sitä erikseen halua.
- Haastattelu nauhoitetaan ääninauhalle, jonka jälkeen haastattelu kirjoitetaan tekstitiedostoksi. Ääninauha tuhotaan sen jälkeen, kun haastattelu on kirjoitettu tekstitiedostoksi.
- Tutkimusaineistoa ja suostumuslomakkeita säilytetään turvallisesti. Dokumentteja voidaan skannata ja säilyttää sähköisesti. Sähköisiä aineistoja säilytetään Haaga-Heliumin turvaamissa tietojärjestelmissä.
- Kaikille osallistujille tarjotaan pääsy tutkimuksen raportin sähköiseen versioon sen valmistuttua.

- Voit olla yhteydessä tutkijaan sähköpostitse [anette.kairikko@haaga-helia.fi](mailto:anette.kairikko@haaga-helia.fi) tai puhelimitse 040 543 2495

Jos sinulla on huomautettavaa tutkimusprosessista, voit olla yhteydessä ohjaajaan [s.dhaiwal1@westminster.ac.uk](mailto:s.dhaiwal1@westminster.ac.uk)

- **Suostumuslomake**

**Tutkimusaihe:** Yrityskiihdyttäjän rooli kansainvälistymismahdollisuuksien luomisessa – tapaustutkimus koulutusteknologian startupeista suomalaisessa kontekstissa

**Tutkija:** Anette Kairikko

- |   |  |
|---|--|
| Olen saanut tiedotteen tutkimukseen osallistujalle ja se on selitetty minulle.  | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Minulle on tarjottu mahdollisuutta kysyä kysymyksiä tutkimuksen tarkoitusperistä ja olen tyytyväinen vastauksiin.   | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Ymmärrän, että voin milloin tahansa vetäytyä tutkimuksesta eikä minun tarvitse esittää syytä.   | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Ymmärrän, että jos vetäydyn tutkimuksesta, kaikki minua koskeva tutkimusaineisto poistetaan, mikäli mahdollista. Jos anonymiaineisto on yhdistetty muuhun aineistoon, yksittäisen henkilön tutkimusaineistoa voi olla mahdotonta poistaa. | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Haluan tietoa tutkimuksen tuloksista.   | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Haluan kopion suostumuslomakkeesta.   | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Haluan osallistua yllä mainittuun tutkimukseen.   | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |
| Anonymiä tutkimusaineistoa voidaan arkistoida ja minua koskevaa aineistoa voidaan käyttää osana tulevia tutkimuksia.  | Kyllä <input type="checkbox"/> Ei <input type="checkbox"/> |

**Osallistujan nimi:** \_\_\_\_\_

**Allekirjoitus:**

**Pvm:**

Suostumuslomake säilytetään irrallaan tutkimusaineistosta niin että tutkimusaineisto säilyy anonyyminä.

Vakuutan, että olen antanut tiedotteen tutkimukseen osallistujalle ja selittänyt sen sisällön. Olen antanut osallistujalle mahdollisuuden kysyä kysymyksiä ja vastannut kysymyksiin.

**Tutkijan nimi: Anette Kairikko**

**Allekirjoitus:**

**Pvm:**

### Appendix 3: Contact letters for interviews

#### REQUEST FOR A RESEARCH INTERVIEW

My name is Anette Kairikko. I work as a senior lecturer at Haaga-Helia University of Applied Sciences. I am also a PhD candidate at the University of Westminster in London. My research focusses on the role of an accelerator in the internationalisation of startups.

The context of the research is the field of education technology and innovative learning solutions. Therefore, I am collaborating with xEdu.

As a part of my research, I would like to interview the CEOs/founding teams of the companies that have already participated in the cohorts spring and fall 2016. I would very much appreciate your time (45–60 minutes) for an interview. The interviews may take place at your premises or at the xEdu office. The interview language can be Finnish or English.

I would like to conduct the interviews during April–June 2017, and I will soon contact you by email and suggest a couple of alternative times. I am also happy to provide you further information regarding my research.

Kind regards,

Anette Kairikko

Senior Lecturer, Haaga-Helia University of Applied Sciences

PhD candidate, University of Westminster

INVITATION TO AN INTERVIEW – an example of an introduction letter to the partners

Dear xx,

We met in spring at xEdu. I am the PhD researcher, and my study focusses on the accelerators and the early internationalisation of startups in the context of education technology. As discussed, I would like to conduct an interview with you (approx. 45 min.). We could do it face to face at xEdu office. The other option is to do it via Skype. Please let me know your preference and your schedules.

Kind regards,

Anette

#### Appendix 4: List of attended conferences during the PhD process

09/2017 ESU Network: Doctoral conference, Lüneburg, Germany (Extended abstract and presentation)

‘Accelerating international opportunities. Case study of education technology startups’

05/2018 Westminster Business School, University of Westminster, London (Abstract and presentation)

‘The Role of Accelerator Networks in the International Opportunity Development of Startups – A Study in the Finnish Education Technology Context’

11/2018 ISBE conference, Birmingham, UK (work in progress paper and presentation; shortlisted for the best paper in ECR category)

‘Leveraging embeddedness in accelerator networks – A Study of Internationalising Startups’

11/2018 ISBE Doctoral Day, Coventry, UK (poster presentation)

‘Leveraging embeddedness in accelerator networks – A Study of Internationalising Startups’

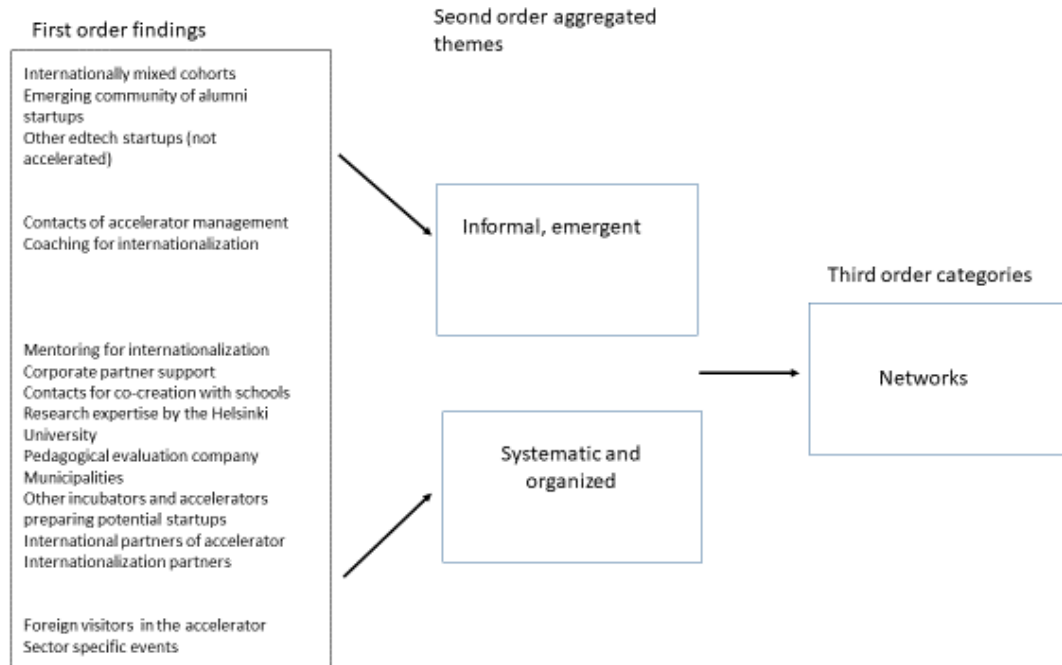
04/2019 II Paper Development Seminar on Entrepreneurial Process Research. Seville, Spain. (Full paper and presentation; the best paper award and fast track access to the RENT conference)

‘Leveraging Embeddedness in Accelerator Networks  
A Study of Internationalising Edtech Startups in the Finnish Context’

11/2019 RENT XXXIII conference. Berlin. (Full paper and presentation; paper accepted for RENT Anthology ‘Frontiers in European Entrepreneurship Research’ to be published by Edward Elgar 2021)

‘Accelerators as an Embedding Mechanism for Internationalising Startups – a Study in the Finnish Edtech Context’

## Appendix 5: Explaining development of international opportunities in an accelerator: from findings to categories

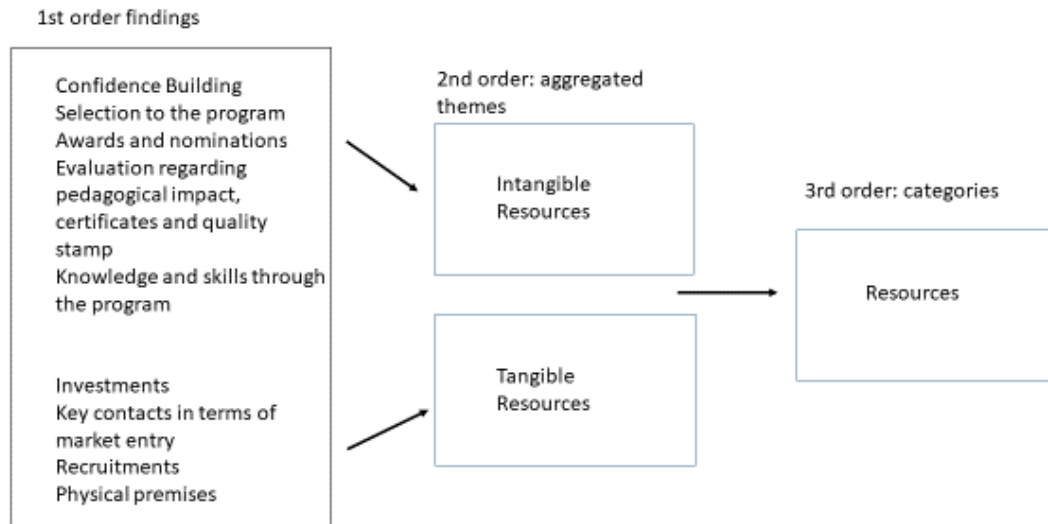


Findings coded (1st order)	Example of empirical evidence	Type of source
<b>Mixed cohorts</b>	‘Of course, there is added value for this dialogue that we during the programme discuss with each other [Finnish and foreign startups] and see that well here it works that way, and seeing it from another angle, we understand that what works here does not necessarily work somewhere else.’	Interview, Accelerator manager (Interviewee 30)
<b>Emerging community of alumni startups</b>	The accelerator facilitates alumni gatherings both formally and informally. The social events like summer parties and Christmas parties enable startups to catch up on the latest events in a more informal setting. The social media group for the alumni community serves as an easy communication channel and seems to reach a number of alumni, and the posts there deal with incoming visitor groups, trainings, and industry events. The alumni themselves are also active and post when they are, for example, looking for a team member or have a team member who could be working for other startups. There are also invitations to various events. On an <i>ad hoc</i> basis the alumni who have stayed in the premises are most active.	Researcher’s observations

<b>Other edtech startups (not accelerated)</b>	‘Well, we haven’t been in the accelerator program. But we gave feedback when the first draft of an accelerator programme was designed. So, we have been sort of a sparring partner, and they were kind of asking what kind of support you have needed and what would have been important issues for you, and we commented on those.’	Interview, Startup entrepreneur, not accelerated (Interviewee 16)
<b>Contacts of accelerator management</b>	‘The programme director introduced us to the Finnish embassy in Tokyo.’	Interview, Startup entrepreneur (Interviewee 11)
<b>Coaching for internationalisation</b>	‘I think it forced to calculate market shares and investigate different markets and do interviews with different cultures and things in that nature, and that process is very important.’	Interview, Startup entrepreneur (Interviewee 34)
<b>Mentoring for internationalisation</b>	‘The most valuable part in coaching and mentoring was everything related to the internationalisation.’	Interview, Startup entrepreneur (Interviewee 7)
<b>Corporate partner support</b>	The major corporate partner focusses on the role of social impact in technology development and brings access to the latest mobile and wearable devices for the startups. Hosts workshops for cohort startups.	Accelerator newsletter post, accelerator social media post
<b>Contacts for co-creation with schools</b>	‘The next step is how to bring people from different parts of the world here to develop their products here and then go back to the parts of the world and be successful. That’s the next step because there are not enough great things in Finland, but if you get all the best edtech solutions imported here, then the co-creation opportunity will be really great.’	Interview, Partner for internationalisation (Interviewee 21)
<b>Research expertise by the University of Helsinki</b>	Pedagogical workshop run by a professor and PhD candidates from the University of Helsinki. The pedagogical experts help the startups to crystallise the pedagogical idea of their solution. There was lecturing, how to localise the solutions. In addition, there were pitching exercises focussed on the pedagogical impact and feedback followed by the pitching.	Researcher’s observations
<b>Pedagogical evaluation company</b>	‘They help us to know which companies have certificates and what kind of feedback and evaluations.’	Interview, CEO of a company selling Finnish educational solutions abroad (Interviewee 31)
<b>Municipalities</b>	‘They [the accelerator] know the needs of the companies, but they do not represent only one company, which is good for the city from the partnership point of view when we are developing these [co-creation activities], since we need to treat companies equally.’	Interview, representative from the city (Interviewee 33)

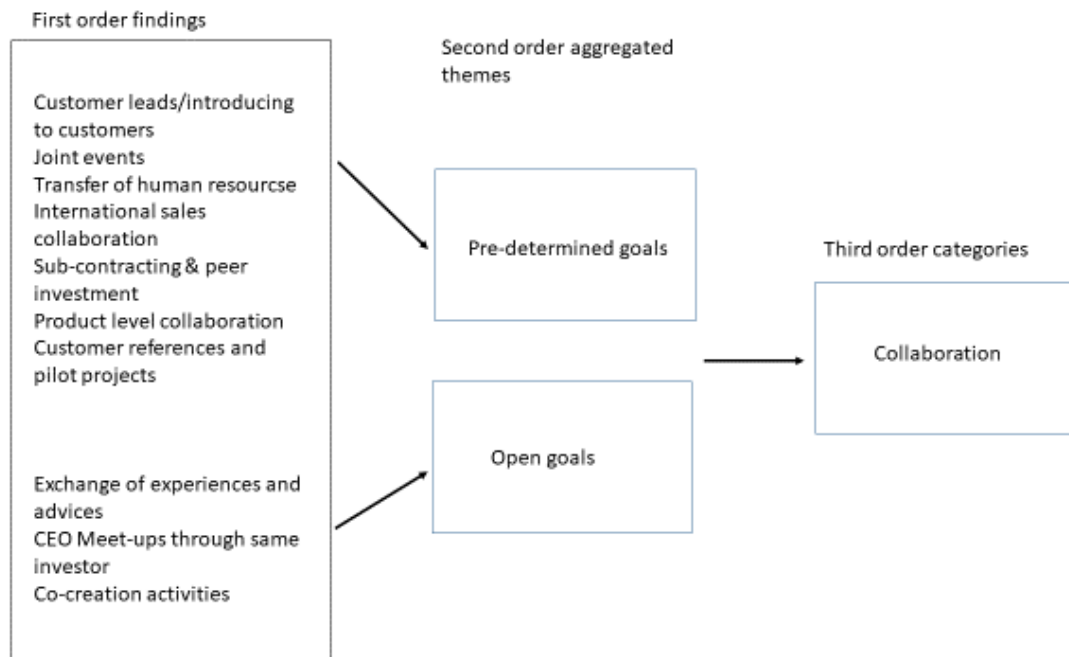


<b>Other incubators and accelerators preparing potential startups</b>	‘For instance, in Helsinki an incubator has created a lean launch pad programme and such startups that have applied for the programme but where we have seen they should still develop further that they are not mature enough, we have tailor made with this incubator a package where they are responsible for the business part, and we have contributed with the edtech part.’	Interview, Accelerator manager (Interviewee 43)
<b>International partners of accelerator</b>	Post on the collaboration agreement with a Silicon Valley based accelerator: ‘Covering our two ecosystems will increase capacity for edtech entrepreneurs to deeply leverage a network of first-class mentors, curriculum, and other enablers that will drive both substantial growth and return on education.’	Accelerator newsletter post
<b>Internationalisation partners</b>	‘I set up a company with a Finnish partner in Hong Kong. He has his own company here and in Hong Kong and with the intention of helping Finnish companies especially edtech companies to find market opportunities in Asian environment. That is how I got involved in education.’	Partner for internationalisation (Interviewee 21)
<b>Foreign visitors in the accelerator</b>	‘We have a 20-ppl delegation from Nigeria parliament coming to xEdu on 27 February from 14:30 to 16:30. They are looking for digital solutions and partners they can bring with them to Nigeria. We’d take around 5 startups for a 10-minute pitch each plus discussion. Anyone interested?’	Social media post in accelerator alumni group
<b>Sector-specific events</b>	A major edtech event was organised for the first time in 2017 as a side event to SLUSH [a major startup event in the Nordics, the concept has spread globally]. The event was organised again in 2018, this time in the city centre of Helsinki. The event hosts speakers from several relevant fields of edtech and hosts panel discussions. Parallel to the programme on the main stage, there is a demo area for edtech startups to meet up with customers, investors and other stakeholders. Especially the latter was crowded throughout the whole event.	Researcher’s observations



Findings coded (1st order)	Example of empirical evidence	Type of source
<b>Confidence building</b>	‘If you get chosen like you make it, your application or your idea gets accepted, it makes you feel like you have potential; it kind of gives you this belief in yourself.’	Interview, Startup entrepreneur (Interviewee 35)
<b>Selection to the program</b>	For the first six cohorts, there were over 600 applicants from 69 countries. There have been 56 startups from 11 countries that have gone through the accelerator program. Thus, the selection ratio is that less than 10% of the applicants are accepted to the program.	Accelerator statistics
<b>Awards and nominations</b>	‘I am very proud of the award [in the GESS exhibition in Dubai], our whole team has worked extremely hard for it! There is currently a huge buzz in the edtech field in Finland and Finnish startups have come up with some truly unique solutions to enhance traditional learning through technology.’	Text material: accelerator newsletter
<b>Evaluation regarding pedagogical impact, certificates, and quality proof</b>	‘Well, three of our products have been evaluated there [an evaluation startup], and we’ve gotten feedback for development and then the certificates which we stress especially in China where the certificates seem to play a role and our game studio immediately put them on logos as well.’	Interview, Startup entrepreneur (Interviewee 26)
<b>Knowledge and skills through the program</b>	‘The pitching training just before London [Demo day in the edtech event] was useful.’	Interview, Startup entrepreneur (Interviewee 29)

<b>Investments</b>	During the first three years of existence more than 10M euros risk capital has been raised by the accelerated startups.	Text material: annual summary created by the accelerator
<b>Key contacts, for example, in terms of market entry</b>	'It is a global publisher that found us and it came through the accelerator and now they've announced they would like to represent us in Asia.'	Interview, Startup entrepreneur (Interviewee 7)
<b>Recruitments</b>	Posts on the alumni group to recommend employees/project workers.	Social media posts in accelerator alumni group
<b>Physical premises</b>	The ventures that have stayed in the building and have their offices there tend to help each other and have informal chats. It is for them also easier to spontaneously react to the invitations sent on a short notice and come to present for foreign delegates. The ventures that stay in the building are often more known among the later cohort programmes, and there are more linkages with them.	Researcher's observations



<b>Findings coded (1st order)</b>	<b>Example of empirical evidence</b>	<b>Type of source</b>
<b>Exchange of experience and advice</b>	‘Well, I would say the biggest thing, it has been this connecting, connecting the startups, they open up with each other and create partnerships and share and learn from each other. I am quite sure it wouldn’t have happened without the accelerator.’	Interview, Mentor (Interviewee 46)
<b>Customer leads/introducing to customers</b>	‘If I know that person may benefit from the contact in his business, I can forward a customer with his request further to that startup. If there is a request without a clear immediate business benefit, I first ask for a permission before forwarding. Kind of building bridges between the people purely out of the genuine interest to make things go forward. And when you start acting that way, you realise that you are treated in the same way.’	Interview, Startup entrepreneur (Interviewee 34)
<b>CEO Meet-ups through same investor</b>	‘Those who are in my portfolio, I have CEO meetings.’	Interview, Investor (Interviewee 17)
<b>Joint events</b>	‘What is interesting is that we got to know a venture that gave us a hint about a person abroad. That company we were connected with in the accelerator was from the previous batch, and we got this international link when we went to an exhibition together. Without knowing other Finnish startups, they wouldn’t have asked us to join the exhibition. So that way, we got this contact and other contacts. Let’s put it that way, a couple of contacts.’	Interview, Startup entrepreneur (Interviewee 13)
<b>Transfer of human resources</b>	‘Two out of six in the team are from Vietnam. The other one came to us actually through a company, which was in the previous batch. They had that person working part-time for them, and we came across and agreed not only with him but also with that other company that we would like to have a share of his input. And now he is actually working full-time for us. So this is how it goes.’	Interview, Startup entrepreneur (Interviewee 4)
<b>International sales collaboration</b>	‘At the moment it is more on <i>ad hoc</i> basis. Each solution is a product with its particular features even if the target group for exports is the same. But I would say we all have our own agendas. Some of us have applications that solve a specific small problem and we, for example, replace a whole study book. But attending exhibitions together is a good example of joint efforts. Joint efforts enable to have a better visibility in the booth.’	Interview, Startup entrepreneur (Interviewee 9)

<b>Sub-contracting and peer investment</b>	‘We have tried to contribute to it, and we have tried to help other startups. The easy ways to collaborate are often investments or sub-contracting.’	Interview, Startup entrepreneur (Interviewee 23)
<b>Product level collaboration</b>	‘It is actually leading to collaboration in our case.’	Interview, Startup entrepreneur (Interviewee 38)
<b>Co-creation activities</b>	The researcher was able to attend events designed to bring startups and schools together. There were speeches presented in earlier co-creation projects. The researcher familiarised herself with the process of KYKY model (systematic co-creation model between the schools of city of Espoo and startups) through the materials created for explaining and promoting the co-creation model.	Researcher’s observations
<b>Customer references and pilot projects</b>	‘And now they got a clearer view or a clearer vision you know, and now we’ve pushed them to do more and more now we’ve been doing trials in kindergartens in Singapore; we are doing trials here in Helsinki in Singapore and trials in Hong Kong next year, so now we can differentiate.’	Interview, Partner for internationalisation (Interviewee 21)

Appendix 6: Summary of the three-dimensional analysis at startup level

Start-up	International opportunity (IO) development			IO development through accelerator networks**						Product/solution***		Startup category
	Exploring IO		Exploitation of IO*							Development stage		
	Revenue No	Revenue Yes	yes	Local networks	Local resources	Local collaboration	International networks	International resources	International collaboration	Ready for markets	Not ready for markets	
SU1												h
SU2												b
SU3												f
SU4												f
SU5												f
SU6												h
SU7												d
SU8												b
SU9												f
SU10												b
SU11												b
SU12												b
SU13												h

SU14												<b>b</b>
SU15												<b>f</b>
SU16												<b>a</b>
SU17												<b>a</b>
SU18												<b>a</b>
SU19												<b>e</b>
SU20												<b>a</b>
SU21												<b>a</b>
SU22												<b>a</b>
SU23												<b>e</b>
SU24												<b>e</b>
SU25												<b>e</b>
SU26												<b>a</b>
SU27												<b>c</b>
SU28												<b>e</b>
* exploitation of IO operationalised as foreign market entry, during the time of the interview 3–12 months after the graduation from the accelerator program												
** international opportunity development through accelerator networks; high equals 3 or more categories, low less than 3 categories												
*** status of the product / solution during the time of the interview 3–12 months after the graduation from the accelerator program												

a = Connected internationals  
 b = Connected international opportunity developers  
 c = Connected product developers with sales through prior products  
 d = Connected product developers with international intentions

e = Independent internationals  
 f = Independent international opportunity developers  
 g = Independent product developers with sales through prior products  
 h = Independent product developers with international intentions

