

A Framework for Entrepreneurs to Assess Business Accelerator Programs

Erica Fischer

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Abstract <p>The purpose of this study was to examine best practices in the business accelerator industry as presented in the literature. Business accelerators offer entrepreneurs access to education, mentors, and investors through fixed-term, cohort-based programs. The accelerator model of supporting startup companies first appeared in 2005, and now it is estimated that more than 3000 programs exist around the world. Accelerators exchange access to resources for equity in young companies. Accelerators are often used by investors to filter companies and locate the best teams and projects.</p> <p>The participants in accelerators need to understand how accelerator program design choices impact company outcomes. Entrepreneurs joining accelerator programs seek to speed their development and maximize their chances of success by accessing accelerator resources, knowledge, and networks. In exchange, accelerators take an equity stake in participating companies and make a seed investment. To give proper consideration to the potential costs and benefits of joining an accelerator, an entrepreneur needs to understand the findings of researchers. Literature reveals that researchers have identified key program design choices that impact outcomes for participating companies.</p> <p>Through an in-depth literature review, these design choices were identified and used to construct a preliminary framework to aid entrepreneurs in their evaluation of accelerator programs. The framework guides entrepreneurs to locate historical data on accelerator performance using public data sources. The gathered data can be used to evaluate accelerator programs prior to application or matriculation in an accelerator program. Entrepreneurs can consider their goals and expectations for accelerator participation and determine which accelerator programs are aligned with their needs.</p>		
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Contents

1	Introduction	4
1.1	Fostering entrepreneurship	4
1.2	Motivation for research.....	6
1.3	Research questions.....	8
1.4	Structure of the thesis	8
1.5	Glossary of key concepts	9
2	Literature Review.....	10
2.1	Incubators.....	10
2.2	Accelerators	11
2.3	How do accelerators and incubators compare?.....	13
2.4	Value proposition.....	16
2.5	Impact of accelerator participation on the entrepreneur	19
2.6	Seed Accelerator Rankings Project.....	20
2.7	Organizations providing accelerator data	23
2.8	Synthesis of knowledge base	24
3	Methodology	26
3.1	Research method.....	26
3.2	Research approach	28
3.3	Research context	29
3.4	Data collection	30
3.5	Plan for research quality and ethics	32
4	Results	34
4.1	Measuring success	34
4.2	First-hand account of a cohort-based program	35
4.3	Impact of accelerators on founder learning	37
4.4	Accelerator design	39
4.5	Accelerator rankings	43
4.6	Cognitive biases.....	48
4.7	The framework to evaluate accelerators	48
5	Conclusions and Discussion.....	55
5.1	Integrative Model for Accelerator Assessment	55
5.2	Answers to the first research question	55

5.3	Answers to the second research question	57
5.4	Practical and managerial implications	58
5.5	Theoretical implications	58
5.6	Assessment of research process and quality of results	59
5.7	Recommendations for future research	61
6	References	62

Figures

Figure 1. Investments made by accelerators by region	6
Figure 2. Accelerator program design.....	12
Figure 3. Five critical components of accelerator programs.....	14
Figure 4. Comparison of incubators and accelerators.	16
Figure 5. Perspectives on the value proposition of an accelerator	17
Figure 6. Investors use accelerators to discover the best companies and teams	18
Figure 7. Criteria for inclusion in the Seed Accelerator Rankings Project 2017	21
Figure 8. How do entrepreneurs select accelerators?	26
Figure 9. Key data sources included in this thesis	30
Figure 10. Founder learning in accelerator programs	38
Figure 11. Accelerator design considerations	40
Figure 12. Companies listed in Seed Accelerator Rankings Project 2018.....	53
Figure 13. Framework to evaluate accelerators	55

Tables

Table 1. Overview comparison of incubators and accelerators	13
Table 2. Seed Accelerator Rankings Project metrics defined	22
Table 3. Adjustments to SARP's selected metrics over time.....	45
Table 4. Where are metrics available?	47
Table 5. Examples of data available at Seed-DB	51

1 Introduction

1.1 Fostering entrepreneurship

Entrepreneurship has received increasing interest around the globe, particularly in the past thirty years. As researchers began highlighting connections between entrepreneurship and economic growth (Wennekers & Thurik 1999), policy makers increasingly began to develop support systems to promote entrepreneurship in their communities. Government entities have promoted entrepreneurship to increase economic diversity and bring jobs into their communities. Universities have fostered entrepreneurship as a part of their business programs and as a way to monetize and actualize public benefits of research conducted at the university. Private corporations and individuals have pursued entrepreneurship as a way to build equity and solve challenging and interesting problems. Research by Fehder and Hochberg (2014) indicated that in regions in which entrepreneurship support programs known as accelerators were established, a corresponding increase of funding of entrepreneurial activities was evident. This increase in funding could lead to an increase in entrepreneurial activity in a given region as well as increasing the likelihood that companies would remain in their home region thereby increasing economic activity and job growth in their local community.

The entrepreneurship support program models that have been most common are known as incubators and accelerators. Young companies have typically joined these programs to obtain support to develop and grow their business. These types of programs are briefly described below, and then they are described in greater detail in the Literature Review.

Business incubators

Throughout the 1990s, incubators became one of the most common support systems where entrepreneurs could access the resources necessary to support their fledgling businesses (Dee, Gill, Lacher, Livesey, & Minshall 2012). Incubators provide entrepreneurs with a safe haven from which they can develop their ideas. Incubators provide access to basic services and some level of mentorship or education to help

entrepreneurs navigate the stages of business development. Typically, incubators offer open enrollment for interested parties. Upon joining an incubator, entrepreneurs move into a shared office space, which enables entrepreneurs to access business services at reduced costs for the duration of their membership. (European Commission 2002.)

Business accelerators

Accelerators emerged in 2005, when Paul Graham and Jessica Livingston created an experimental program called Y-Combinator (YC). Graham and Livingston's objective was to create a new approach to serving startups. Initially, they offered a summer program to undergraduate students in Boston who wanted to work on building businesses. The cohort of companies was supported with a stipend so that the entrepreneurs had money to live off of, and in return, YC gained equity in participating companies. The founders' goal was to learn how to invest in startups. To the surprise of the YC founders, working with a cohort on a synchronous schedule over a 3-month period produced excellent results. YC was successful from the first cohort and hosted a second cohort in the Silicon Valley a few months later. Thus, two key start-up markets—Boston, Massachusetts and the Silicon Valley in California—saw this new entrepreneurial support system model firsthand in the first year of its existence. (Graham 2012.)

Business accelerators are business support and development programs modeled after the YC program developed by Graham and Livingston. As more and more organizations copied the model, variations developed and YC continued to develop as well. In 2016, the Global Accelerator Report gathered data on 579 accelerators (Gust 2016). In a 2016 article, Hochberg noted that global estimates suggested more than 3000 accelerator programs were in existence. Clearly the accelerator model of supporting startups had a broad appeal for such rapid growth to occur in just over a decade. The financial impact of the accelerators reviewed by the Global Accelerator report revealed that the global investment made by the 579 accelerators in their study exceeded 200 million US dollars as shown in Figure 1. Investments were made around the world, with the majority of accelerator investments occurring in the North America.

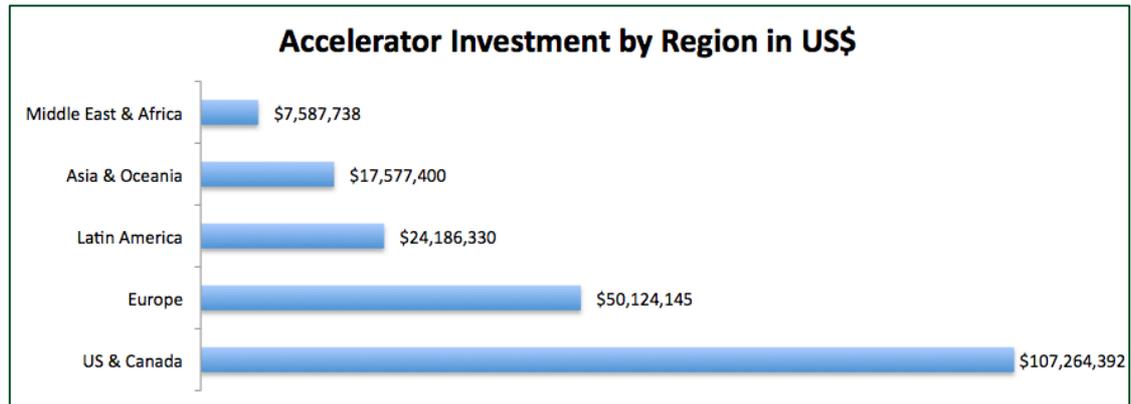


Figure 1. Investments made by accelerators by region
Data reported in Global Accelerator Report 2016 (Gust 2016).

A typical accelerator model works by investing in participating companies. To join an accelerator, the business must first apply, and then successfully navigate a highly competitive selection process. Upon an offer of admission to an accelerator, a business typically receives legal assistance to incorporate and provide the accelerator with equity—usually in the range of 5-10%—in exchange for an investment in the company, on average \$25,000 (Gust 2016). The accelerator program then holds a boot camp designed to help companies develop their products. The cohort of participating companies meets for a fixed period of time at a location provided by the accelerator. Throughout the program, the participants attend educational seminars and meet with mentors while developing their business. At the conclusion of the accelerator program, the companies in the cohort are given the opportunity to present their company to investors at a demo day in the hopes of securing additional funding. There are many variations of the accelerator model, but the model described above is the most typical (Hochberg, Cohen, & Fehder 2017).

This thesis explores business accelerators from an entrepreneur's perspective and provides a framework for entrepreneurs to use to evaluate accelerator programs to determine which programs are likely to support the entrepreneur's goals.

1.2 Motivation for research

The author has worked as an entrepreneur for more than 20 years. During this time, the author has actively sought information on programs and resources available to assist entrepreneurs as they seek to establish and grow a company. The author has also participated in programs designed to help entrepreneurs access mentors, funding, and

knowledge needed to grow a company. During this time, accelerator programs have especially captured the author's interest. The author observed that entrepreneurs often struggled to gain clear insights into accelerator program offerings prior to joining. Prior to conducting this research project, the author noted that it was often difficult to clearly ascertain exactly what services, benefits, and outcomes accelerator program participants should expect through their participation. Furthermore, accelerator program admissions are known to be highly competitive. Admission in leading programs has been as low as 0.4% of applicants, and on average across programs, acceptance rates have been 4% of applicants (Butcher 2014). Given the highly competitive and selective nature of the application process, entrepreneurs might believe that the programs offer value simply due to the scarcity of access to the programs. However, before creating and submitting an application to an accelerator program, it is in the entrepreneur's best interest to gather data on the program. Rather than relying on the accelerator's reputation and competitive selection, entrepreneurs should seek to determine what benefits are likely to be conveyed to the entrepreneur in exchange for their investment of time and exchange of equity in their young startup.

Cohen and Hochberg (2014) state, "While proliferation of such innovation accelerators is evident, the efficacy of these programs is far from clear." This statement should give pause to an entrepreneur considering joining an accelerator. Not all accelerators are helpful to participating companies, and therefore, an entrepreneur needs tools to evaluate accelerators prior to applying and joining any program.

One group of researchers, Hochberg, Cohen, and Fehder (2014, 2017), have created an accelerator ranking system because "for an entrepreneur considering an accelerator program, finding data regarding the performance of programs is difficult, and there is much confusion and debate regarding how 'performance' should be measured for an accelerator." Their ranking system is known as the Seed Accelerator Rankings Project (SARP). Details on SARP are found in Literature section.

This thesis seeks to bridge the knowledge gap that prevents entrepreneurs from setting clear expectations and making reasonable judgments on potential outcomes from accelerator participation. This thesis aims to provide entrepreneurs with greater understanding regarding what accelerators offer and what track record they have had with previous participants. The goal is to equip entrepreneurs to make informed decisions regarding whether or not to apply and join an accelerator.

1.3 Research questions

This thesis sought to develop a framework that entrepreneurs can use to evaluate accelerators. Prior to submitting an application to join an accelerator, an entrepreneur needs to investigate several key aspects of the accelerator program. The entrepreneur seeks to understand what resources are provided by the accelerator, the reputation of the program, and what level of time and financial commitment the entrepreneur will need to make to participate in the accelerator. Moreover, the entrepreneur needs to consider the format of the accelerator program and success rate or track record of the accelerator; unfortunately, these metrics may not be readily accessible to entrepreneurs.

This thesis focused on developing parameters for entrepreneurs to help them be prepared to investigate accelerators and select a program that suits their specific interests and needs. The developed framework addressed the following key questions:

1. What program model should an entrepreneur seek when applying to an accelerator?
2. Where can entrepreneurs locate the data that will allow them to evaluate the track record of a given program prior to submitting an application?

In the end, the author created a framework to help entrepreneurs evaluate accelerator programs. This framework was designed to guide entrepreneurs regarding what features to seek in accelerator programs.

1.4 Structure of the thesis

The introduction includes the motivation for this research as well as the research questions. Immediately following this subsection, the reader will find a glossary of key terms.

Following this introduction, the literature review describes the accelerator phenomenon beginning with a brief overview of the history of accelerators, and then considering the value proposition offered by accelerators. Next, the literature review will focus on describing some of the large projects that are working to document metrics related to accelerators and the companies that participate in those accelerators.

Following the literature review, this thesis will describe the methodology and research approach used to gather data, analyze the data, and verify the results. Next the reader will find the results and discussion. The answers to the research questions include a framework and the practical implications of the framework. The final sections of this thesis highlight the limitations of the work conducted and provide suggestions for further research.

1.5 Glossary of key concepts

Accelerator: A program designed to help startup companies prepare for venture capital (VC) investment. The program is designed to scale the young businesses quickly. A competitive application process is used to select a cohort of companies that join an accelerator for a fixed period of time (often 3 months). Typically, participants receive a stipend, mentoring, educational seminars, and access to VC investors via a demo day at the end of the program. The accelerators usually acquire 5-10% equity in the participating companies in exchange for a stipend (\$25,000 on average), but there are also a limited number of non-profit accelerators in existence and these rarely take an equity stake in the company. (Hallen, Bingham, & Cohen 2017.)

Incubator: Open enrollment programs that provide participating companies with services available for free or in exchange for monthly rent. Services may include office space, limited access to business advisors, and seminars. Duration of participation varies from a few months to several years. The incubator may be affiliated with government organizations or groups of angel investors. Incubators do not take equity in the participating companies. (Cohen 2014.)

Demo day: A dedicated forum in which investors are invited to hear start-ups pitch their company and seek investment to accelerate growth.

Cohort: A group of businesses that join an accelerator as part of the same class. The cohort will start the accelerator program together, participate in the various program activities together or in tandem, and graduate together.

Mentor: An experienced member of the startup community who works with participating companies to give advice, answer questions, and provide connections to companies in the accelerator program.

2 Literature Review

The literature review aims to provide the reader with a brief overview and comparison of the two leading program models used to support entrepreneurs: incubators and accelerators. Next, the literature review highlights the research that has investigated the value and benefits that accelerators offer to participating companies. Finally, the literature review provides information on three prominent projects collecting data and on accelerator participants and outcomes. The projects described are Seed Accelerator Rankings Project, Startup Genome Report, and Seed-DB.

2.1 Incubators

Entrepreneurship support organizations in the form of incubators have been in existence since the 1960s (Dempwolf, Auer, & D'Ippolito 2014). Incubators work with young companies to provide support designed to increase the likelihood of the company surviving and thriving. Allen and McCluskey (1990) defined incubators as programs providing “affordable space, shared office services, and business development assistance” in a manner “conducive to new venture creation, survival, and early stage growth.” Business development assistance typically takes the form of access to advisors or mentors and assistance connecting with business services such as legal and financial professionals. Cohen and Hochberg’s research revealed that 93% of incubators were run by economic development non-profit organizations, and approximately one-third of incubators were connected to universities (2014, 9).

An entire industry has emerged to support the incubator ecosystem. Many incubators have managers who offer advice and guide companies to prepare to seek funding from angel investors or Small Business Administration loan programs. The International Business Innovation Association (InBIA) began supporting incubator managers in 1985 with annual conferences. They have expanded their services to support a range of organizations with a mission to help entrepreneurs succeed. The organization offers a certificate program designed to help managers of incubators and accelerators. (InBIA 2019).

Incubators rarely limit the amount of time that companies can remain in their programs. Dempwolf et al. (2014) reported the average length of time a company spends at an incubator is 33 months. Thus, a company can join an incubator and

experience the protective support for an extended period of time. Cohen and Hochberg (2014) assert that this approach may keep failing companies alive for an extended period of time, which goes against the fail fast mindset promoted by the Lean Startup Methodology (Ries 2011).

2.2 Accelerators

Accelerators are the next iteration of entrepreneurship support and development programs. As noted in the introduction, the first accelerator was Y-Combinator founded by Paul Graham and Jessica Livingstone in 2005 (Cohen & Hochberg 2014). The program they started included six key factors:

1. Cohort of companies moving through accelerator together
2. 3-month time limit
3. Learning opportunities through lectures and mentors
4. Open dialogue between participating companies
5. Support services (office space and basic equipment)
6. Access to investors

Accelerators are designed to help young companies gain access to the network, knowledge, and funding they need to grow quickly, and there is a definite emphasis on speed. There is also an emphasis on learning through intense, compressed education and expectations to take quick actions towards developing the business (Hathaway 2016). Participation in a accelerator gives the entrepreneur and startup teams ready access to seed funding, advisors and mentors, networking opportunities with other startups, affordable office space, and perhaps most importantly, access to investors. (Fehder & Hochberg 2014)

For the purpose of this thesis, accelerators are programs that meet the parameters as defined by Cohen and Hochberg (2014): “A fixed term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event or demo-day.” Furthermore, this thesis considers programs that are selective, such that participants are chosen through a competitive application process.

Cohen and Hochberg’s definition allows for programs that vary in length, but they do have a fixed-term for each cohort. A cohort is a group of companies that start the program together and graduate at the end of the fixed term. Cohen’s definition also

allows for programs that do not take equity in the company. Most accelerators do offer stipends or investments in exchange for equity, but there are programs run by non-profits, government entities, and universities that do not take equity nor offer stipends.

Accelerators offer access to mentors and education using various models. Some accelerators boast large mentor networks and provide each accelerator participant with an intense schedule of meetings with many mentors. Other programs offer smaller networks and access to fewer mentors.



Figure 2. Accelerator program design. (Cohen & Hochberg 2014)

The program culminates in a public pitch event or demo-day (Figure 2). The demo day provides the participant companies with an opportunity to seek funding from a select group of investors who are invited to meet the participants and consider making investments in the companies. The demo day is considered a key benefit to participants who are considered to be pre-qualified to some degree through their selection and participation in the accelerator. In turn, the investors may be able to observe the founders during the accelerator program by acting as mentors or program managers, thus giving investors time to judge the suitability of the young companies' ideas and teams. (Fowle 2017) Similarly, accelerator participants have access to invited investors and an opportunity to pitch their company to multiple potential investors at once.

Accelerators are founded by all sorts of sponsors. Some accelerators are non-profit, such as those sponsored by governments and universities. Other accelerators are for-profit entities sponsored by individuals, investor groups, or corporations. Accelerators also operate in all industries. In recent years, many accelerators have specialized in specific verticals such as education, healthcare, green-tech, or artificial intelligence. It is quite common for accelerators to target software as a service (SaaS) companies. For example, GAN reports that 82% of accelerators are looking for SaaS or software companies to join their cohorts (Riley 2018).

2.3 How do accelerators and incubators compare?

Incubators and accelerators have emerged as the leading models to support and promote the development of new companies. The International Business Innovation Association (InBIA) is the leading membership organization designed to support the entrepreneurial ecosystems around the world. They specifically offer education and certifications for incubators and accelerators as well as other support programs such as co-working spaces. InBIA states that the key benefits of incubators and accelerators include access to a network of partners, mentors, education, and investors. (InBIA 2019).

Cohen and Hochberg (2014) detail the key differences between incubators and accelerators, which are summarized in Table 1. Accelerators have a very selective application process and then they invite a cohort of companies to join for a fixed period of time. In contrast, incubators typically have an open policy allowing companies to easily join at any time and stay for as long as they desire. Another key difference is that accelerators often become investors in the participating companies, while incubators do not take ownership in the participating companies. Finally, accelerators usually offer highly structured and intensive educational opportunities via seminars and mentoring while incubators have a more ad-hoc, limited approach to education and mentorship.

Table 1. Overview comparison of incubators and accelerators
Adapted from Cohen and Hochberg 2014.

	Incubator	Accelerator
Duration	Flexible period from months to years. Average length of 33 months (Dempwolf et al. 2014).	Fixed period. Typically 3 months.
Cohorts	No cohorts. Open membership as space allows.	Cohort of companies attend program together.
Business Model	Non-profit. May charge rent for office and basic services. Do not acquire equity in companies.	Usually for profit. Often obtain equity in the participating companies.
Selection Approach	Open enrollment. Limited only by space available.	Competitive application. Top ranked programs have less than 1% acceptance rate.
Education Opportunities	Local providers give ad-hoc seminars on a periodic basis	Structured program with comprehensive learning via a scheduled seminars
Mentorship Offered	Minimal	Intensive

A report commissioned by the Department for Business, Energy and Industrial Strategy (Bone, Allen, & Hailey 2017) investigated the incubator and accelerator business support systems. The report highlights the benefits of incubators and accelerators as entrepreneurship support systems designed to:

- guide nascent firms through their early development to increase likelihood of survival and growth,
- providing learning opportunities and mentoring that can help companies avoid common mistakes,
- strengthen the team's knowledge,
- clearly define a firm's product and market, and
- access funding sources.

Bone et al. (2017) highlights that incubator and accelerator support models share some features, such as business support and some training. But often, those similar program features are delivered at different levels of intensity.

According to Cohen and Hochberg (2014), the critical components of accelerator programs that differentiate them from incubators are duration, cohorts, incentives, educational programs, and mentorship and network development.

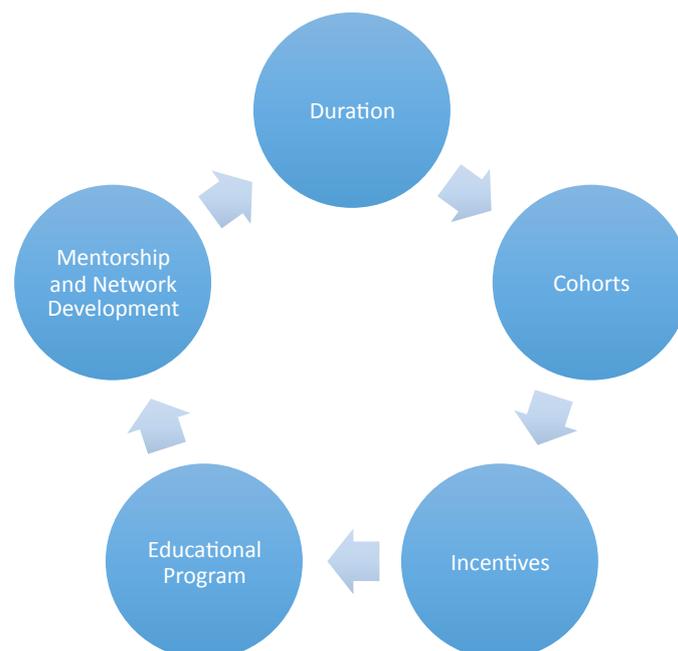


Figure 3. Five critical components of accelerator programs.
(Cohen & Hochberg 2014)

Duration: Cohen and Hochberg (2014) highlight a few key impacts of the duration of the accelerator and incubator programs. First, they note that the intense workload expected of accelerator participants during the accelerator program would not be sustainable long-term. Secondly, they note that the shorter duration of an accelerator and the increased pace of testing the business ideas and strategy could lead to faster failure or faster success. Fast failures are helpful to entrepreneurs as they are freed up to move on to pursue new ideas that ultimately succeed and generate economic benefits for society.

Cohorts: The structure of accelerators ensures that groups of companies join and progress through the program in cohorts. The intensity of the accelerator program and the camaraderie developed by working towards milestones in sync is said to create strong bonds between participants within each cohort. (ibid. 2014.)

Incentives: Accelerators typically take equity in the participating companies. Thus, the accelerator founders and managers take ownership in their portfolio companies and are incentivized to provide as much assistance as possible to drive each company to a successful exit.

Educational program: Accelerators typically offer structured educational opportunities via seminars on a range of business topics. Participants are said to compress years worth of learning into the accelerator timeframe through structured seminars, active application of learnings, and individualized guidance from the lecturers (Hathaway 2016).

Mentorship and network development: Accelerators always feature a strong mentorship component. Many ventures cite access to mentorship as one of the key reasons they chose to join an accelerator. The intensity of access to mentors varies from program to program. Some accelerators push participants to meet with up to 75 different mentors in their first month of the program. Other accelerators have a slower pace and lower volume for mentorship meetings. (ibid. 2014.)

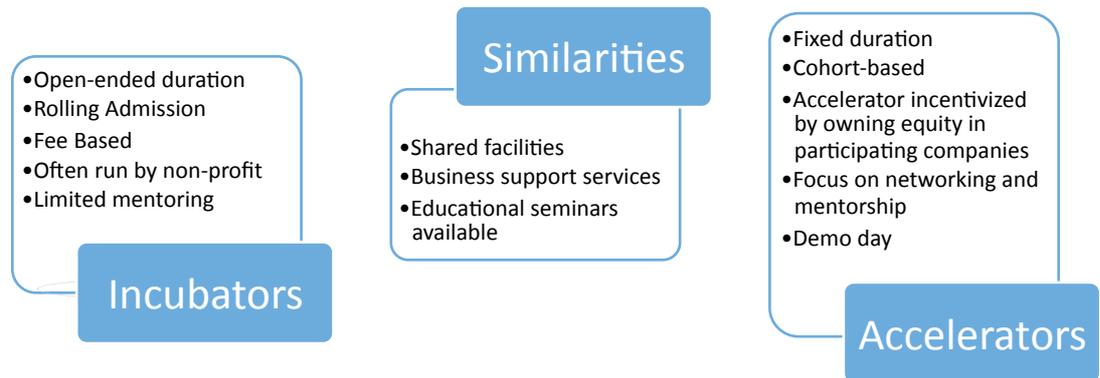


Figure 4. Comparison of incubators and accelerators.
Adapted from Dempwolf, Auer, and D'Ippolito 2014.

2.4 Value proposition

Ultimately, accelerators are in the business of helping startups achieve market success. While some accelerators are non-profits supported by governments or educational institutions, most accelerators are for-profit businesses. For-profit accelerators acquire equity in all participating companies. For the accelerator to thrive as a business, it seeks to ensure its participating companies grow and achieve marketplace success. Thus, accelerators are in the business of supporting start-ups and they generate revenue when their start-ups have successful exits such that the accelerator gets a significant return on their initial investment into the startup. (Fehder & Hochberg 2014)

There are two perspectives on the value created from accelerator participation, as shown in Figure 5. The participating entrepreneurs are looking for the connections, financing, and knowledge needed to grow their business. The accelerators are looking for the teams with strong potential to build the value of the accelerators' investment portfolios. Hochberg (2016) indicates that investors reduce their cost of searching and sorting investment opportunities by partnering with accelerators. Often investors will serve as mentors to gain access to the participants and observe their skills and business acumen.

Value for the Participant

- Connections: cohort, mentors, and accelerator network
- Access to investors and funding
- Knowledge
- Speed of execution of business development

Value for the Accelerator

- Build investment portfolio
- Early access to teams and founders
- Reduced costs to search and sort investment opportunities

Figure 5. Perspectives on the value proposition of an accelerator (Fehder & Hochberg 2014; Hochberg 2016; Butcher 2014)

The top-ranked accelerator programs have highly competitive applications. According to Butcher (2014), the average acceptance rate at accelerator programs is 4% and the most competitive programs are said to accept only 0.4% of applicants. The demand for the limited space in accelerator programs is based on the value proposition. Specifically, accelerators promise to provide young ventures with a higher likelihood of achieving market success. Additionally, the accelerator model helps a young company speed through early development and pitch their company to vetted investors in the hopes of securing financing to further accelerate development and growth. Speed is essential in the startup world, particularly with technology businesses.

Hochberg (2016) summarizes the value proposition of accelerators for both parties. Participants gain access to networks, investors, lower costs of business services, mentorship and education through participation in accelerator programs. On the part of accelerator programs, they achieve value by gaining access to a large number of companies during the application process. Selected companies can be observed throughout the accelerator program. By acting as mentors, potential investors can build working relationships and conduct due diligence before making decisions on additional investments into participating companies. Essentially, investors are able to use accelerators as a filtering mechanism in which they gather intelligence on the quality of potential teams and gain a front-row seat to any investment opportunities in particularly interesting companies as shown in Figure 6. By founding or working in

accelerators, investors can reduce their risks while simultaneously increasing potential rewards for their invested time and money.

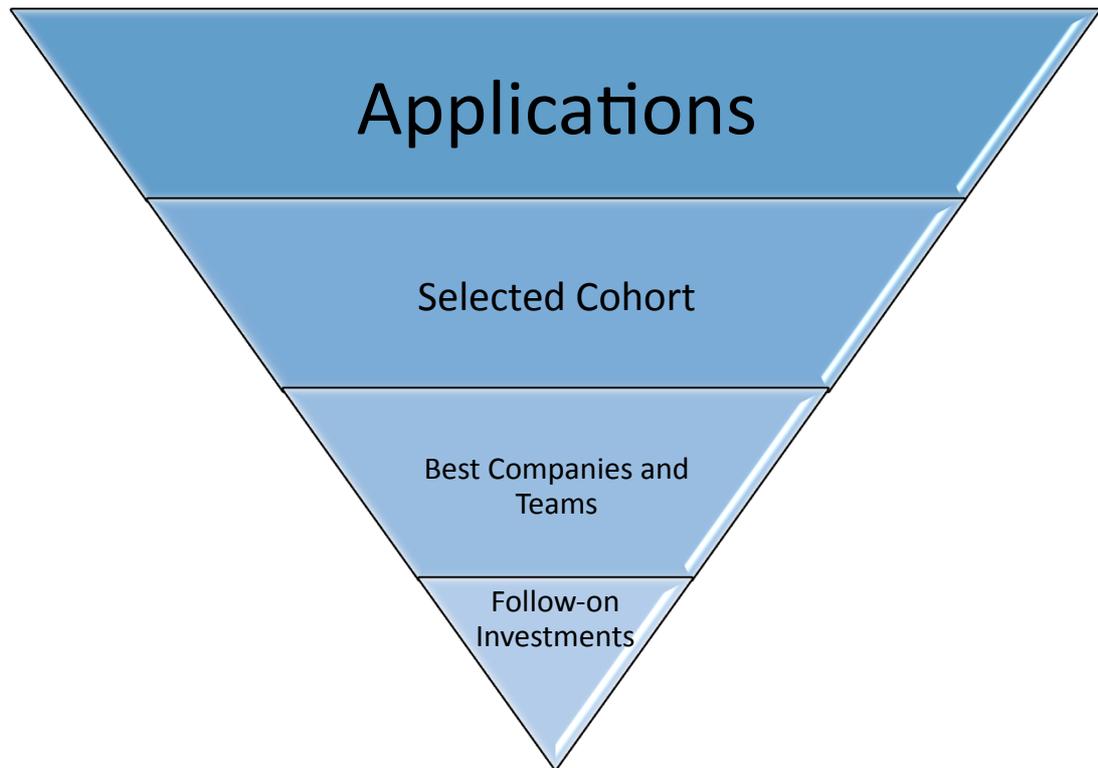


Figure 6. Investors use accelerators to discover the best companies and teams. (Hochberg 2016)

Accelerators end each cohort period with a demo day. This is an event in which the participating companies have the opportunity to present their company to investors. The accelerators invite interested investors to come listen the pitches given by the participants. These investors may have also worked inside the accelerator as mentors, or they may be meeting the participating companies for the first time at demo day. Investors do know that the participants have undergone a competitive interview and the intense development process of the accelerator. This serves to provide the investor with additional confidence in the capabilities of the teams presenting investment opportunities. Furthermore, the investors have much more information on the participants than they might typically access through other channels. Vallese (2015) asserts that some companies choose to participate in accelerators primarily because of this preferential access to investors.

The name “accelerator” implies that companies will reach key milestones faster in an accelerator than they might achieve on their own. Researchers have studied whether or not accelerators do indeed accelerate timelines for participating companies. Hallen, Bingham and Cohen’s (2017) research indicated that some accelerator programs do accelerate the participants’ timelines to specific milestones. Their study found that participants in accelerators raised venture capital funding faster than controls, and they also achieved a modest level of web traffic, which was defined as 250,000 daily views. Only some accelerators were found to accelerate the timeline for companies to be acquired or reach high levels of website traffic (2 million daily views).

2.5 Impact of accelerator participation on the entrepreneur

The overarching goal of research by Hallen et al. (2017) was to determine whether or not accelerators benefit participants across a range of metrics. Their conclusion is that many accelerators do benefit participants, but the effects are not consistent between programs. Some accelerators in their study were shown to inhibit the development of participating companies across some dimensions.

In the study published a year later by the same research group, Cohen, Bingham, & Hallen (2018), bounded rationality was used as a framework to consider how accelerators can mitigate bounded rationality tendencies in individuals participating in accelerator programs. Bounded rationality has three key concepts. First, bounded rationality states that individuals never have complete information, and simultaneously, individuals are ignorant of the gaps and inaccuracies in their knowledge. Second, bounded rationality states that individuals have tendencies to minimize cognitive effort and tend to stop searching for alternative solutions once they find an option that seems to be “good enough.” Finally, bounded rationality finds that individuals default to their cognitive biases when making decisions. There are different types of bias. The confirmation bias leads an individual to give greater weight to information that aligns with his or her beliefs and disregard or minimize the consideration of information that is contrary to the individual’s beliefs. The availability bias leads an individual to rely on easily accessible information. The social proof bias leads an individual to rely on the report of others to determine how the individual should act.

Effective marketing takes advantage of these biases. Companies build brand awareness and social proof of effectiveness to attract customers. Accelerators also use these strategies to attract applicants. The savvy entrepreneur will recognize cognitive biases and seek information that can be evaluated with logic and critical thinking. Applying to and joining an accelerator is a significant commitment in the life of a company, and entrepreneurs need to make informed decisions. To make informed decisions, they need information about how accelerators operate, what services are offered, and what successes they have achieved for previous participants. Accelerators are not necessarily forthcoming with this type of information.

Fortunately, in recent years, there have been some efforts by academics to evaluate and rank accelerators. These rankings and data sets can give entrepreneurs some idea of the quality of an accelerator program as evidenced by the success of previous participants. These resources and ranking projects are described in the following sections.

2.6 Seed Accelerator Rankings Project

The Seed Accelerator Rankings Project (SARP) was created by a group of academic researchers who gained the trust of many prominent accelerators. These accelerators were willing to turn over proprietary data for confidential analysis by the academics. The SARP project is a result of the many years of data analysis conducted by Hochberg, Cohen, and Fehder. The stated motivation for the SARP project is “to provide greater transparency regarding the relative performance of programs along multiple dimensions that may be of importance to entrepreneurs.” (Hochberg, Cohen, & Fehder 2014, 2015, 2017, 2018; Gruber 2012; Schieber 2014)

Thanks to the creation of the Seed Accelerator Rankings Project, entrepreneurs can easily view accelerator program rankings based on the criteria the academics believe indicates the strongest history of success. If past success is a predictor of future success, then entrepreneurs can have some assurance that joining one of the programs ranked by SARP will be helpful to growing their company.

The researchers state that SARP project is designed to encourage open conversation about the accelerator industry. As more and more programs emerged, the variety in program types, structures, and goals increased as well. Hochberg et al. (2017) were concerned because “for entrepreneurs considering an accelerator program, finding

data regarding the performance of programs is difficult, and there is much confusion and debate regarding how ‘performance’ should be measured for an accelerator.” To mitigate this lack of data availability for entrepreneurs, the SARP project provides transparency regarding which metrics the researchers believe are most likely to contribute to participant success. Accelerator programs do not tend to publish detailed data on their participating companies successes and failures. However, Hochberg et al. have been able to gain access to accelerator data as independent academic researchers. In turn, they have used their confidential data to draw conclusions regarding the relative success of programs and use that information to publish rankings.

The Seed Accelerator Rankings Project utilizes metrics that researchers believe offer the best insights into potential successful outcomes from participation in an accelerator. The data is collected from fieldwork including interviews of investors, participants, and accelerator program directors. In the 2017 Accelerator Rankings (ibid. 2017) SARP invited 150 programs to participate. The final ranking lists only 30 of the companies, thus only 20% of the invitees achieved scores high enough to gain them a place on the ranking list.



Figure 7. Criteria for inclusion in the Seed Accelerator Rankings Project 2017 (Hochberg, Cohen, & Fehder 2017)

Programs that qualified to continue in the rankings consideration pool were required to share confidential data regarding outcomes from program participants. Additional

data was gathered from public sources and surveys sent to graduates from the accelerator programs. The metrics used by SARP are detailed in Table 2. SARP states that the metrics are weighted such that some categories are of higher importance than others.

Table 2. Seed Accelerator Rankings Project metrics defined
Adapted from Hochberg, Cohen, and Fehder 2017.

Valuation	Mean and median valuations of participating firms at 1, 2, and 3 years post-graduation. Companies who have not had priced funding rounds are assigned values of zero. Additional data set was created that excluded firms that have not had a priced round of funding.
Qualified Exit	A company issuing an initial public offering (IPO) or acquired for at least \$5 million (after subtracting raised funds) is considered an exit.
Qualified Fundraising	Accelerators Ranked by percentage of firms that were able to raise more than \$200,000 within 12 months of graduation, excluding guaranteed investments from accelerator participation. Additional metrics looked at successful fundraising (>\$200k) at anytime following graduation.
Survival	The percentage of participants still in business at 12, 24, and 36 months after graduation. Noted to be weighted lower than other metrics in the SARP because survival is a controversial measure of success.
Founder Satisfaction	Using Net Promoter Score to determine satisfaction with the program participation. Researchers surveyed all participants of participating programs and claim more than 90% responded.

While the Seed Accelerator Rankings Project analysis and ranking is completed behind closed doors using proprietary data, the authors do reveal that the categories receiving higher weight in the calculations are valuations, fundraising, exits, and founder satisfaction. They also make adjustments to the metrics based on the stage of entering companies and how accurate the measurements are believed to be.

Researchers reveal that when data inputs were unavailable from programs, those programs were excluded from the rankings. SARP does not provide details on the companies that applied, but were excluded. There are estimated to be more 3000 accelerators in existence (Hochberg 2016), which highlights that the SARP project provides insight on a very small percentage of accelerator programs.

2.7 Organizations providing accelerator data

Startup Genome Report

Startup Genome collects data from more than 10,000 founders to create data sets that are used to understand and advance the startup ecosystems around the world. Each year, Startup Genome publishes a report on the state of startup ecosystems in various verticals and locations. Startup Genome collaborates with other industry leaders, including Crunchbase, which is described below. Entrepreneurs can use tools like the Startup Genome Report (Gauthier, Stangler, Penzel & Morelix 2018) to determine which industries are generating significant interest from investors, and which areas are current top performers to support startups.

The recent report includes a good deal of information on the accelerator industry and highlights ways entrepreneurs can take advantage of the accelerator ecosystem. The 2018 report emphasizes the importance of an entrepreneur's mindset and the value of receiving coaching on mindset orientations that lead to success. The Startup Genome report has been able to gather data on the stages of startup development that capture the focus of entrepreneurs and correlate those areas of focus to startup success. They have also found insights that reveal the number of times an entrepreneur attends an accelerator is correlated to the stage of development on which he or she tends to focus. The findings are discussed in the data section.

Crunchbase

Crunchbase is a database that aggregates data on the startup ecosystem. Participants across the startup ecosystem—including founders, investors, and accelerators—are able to register and submit data to the site. Crunchbase also employs staff to gather data and populate the site. Furthermore, staff moderate submissions to the site. The data on Crunchbase is used by people throughout the startup ecosystem to gather data on opportunities, personnel, and competitors. Of interest in this thesis, Crunchbase has amassed a large data set on accelerators, accelerator participants, and the eventual outcomes of accelerator participants. (Crunchbase 2019.)

Seed-DB

Seed-DB is a database focused specifically on accelerator programs. The data collection and analysis began in 2009. Data is pulled live from external sites, in particular from Crunchbase. The site currently displays data on 190 accelerator programs globally, which have accelerated 8000 companies. Entrepreneurs can utilize Seed-DB to easily review data organized by accelerator and see all the companies that exited from a specific accelerator program. Entrepreneurs can use this data to analyze accelerators and gain understanding about the types of companies that have graduated from specific accelerators. Entrepreneurs can also view data on investments, exits, and failures for previous accelerator participants in the accelerator programs listed on the site. The use of this data to evaluate accelerator programs will be discussed in the results section. (Christiansen 2019.)

Global Accelerator Network

The Global Accelerator Network (GAN) was founded in 2010 by David Cohen and Brad Feld who also founded the well-known accelerator Techstars in 2007. Together, they created GAN to connect the leading accelerators around the world. GAN is an invitation-only group of accelerators, partners, and investors. In 2014, GAN became a completely independent from Techstars to further its mission to support all members equally as a neutral third-party. The members of GAN have banded together to highlight their commitment to doing business with a “values-oriented and founder-first mentality.” Members of the GAN network have accelerated over 10,000 startups. The organization states that 85% of participants in their network are still in business and participants have raised an average of \$750,000 following their participation in the network. The GAN network serves as another tool for entrepreneurs to use when considering accelerator programs. (GAN 2019.)

2.8 Synthesis of knowledge base

As seen in this literature review, entrepreneurs have access to a wide range of organizations with information on accelerator programs. The challenge entrepreneurs face is how to organize the data from all of these sources into an action plan. Choosing an accelerator that can aid the founders in speeding up their timelines and increasing their likelihood of gaining investments and success requires understanding

the accelerator models, the current understanding of what aspects of accelerator programs benefit participants, and the historical successes or failures of a given program. The various organizations listed in this literature review make it possible for entrepreneurs to begin to put the pieces of the puzzle together to select accelerators that can provide their team with the greatest opportunities for success.

While one would presume that entrepreneurs would select an accelerator based on the reputation, or network, or funding history, research by Hallen, Bingham, and Cohen (2017) reveals that entrepreneurs showed very little “awareness of potential quality differences between programs.” Instead of focusing on the quality of the accelerator programs, entrepreneurs reported that they often chose their accelerator program based on the location or the start date. This is concerning. It indicates that entrepreneurs are not carefully considering the accelerator programs and the potential risks and benefits that participating in an accelerator might pose to their organization. Furthermore Hallen et al. states, “the efficacy of these programs is far from clear.” The authors further clarify that because the accelerator phenomena is so new, it is too early to assess the outcomes for most participants. There is simply not enough long-term data. Thus, it is imperative that entrepreneurs approach accelerator programs with appropriate expectations and a better understanding of the risk and reward continuum. The hype and competition to gain admittance to the top accelerators tends to give entrepreneurs the impression that admission is highly valuable and desirable. Indeed, it may be valuable for some or many companies, but to succeed in business requires an entrepreneur to really understand what activities will be helpful and valuable to the current project and team with whom they are working.

To summarize, prior research indicates that there have been significant quality differences between accelerator programs, however entrepreneurs have shown a lack awareness of the quality differences between programs. Instead of selecting programs based on quality, entrepreneurs reported selecting programs based on the start date and location.

How do entrepreneurs select accelerators?

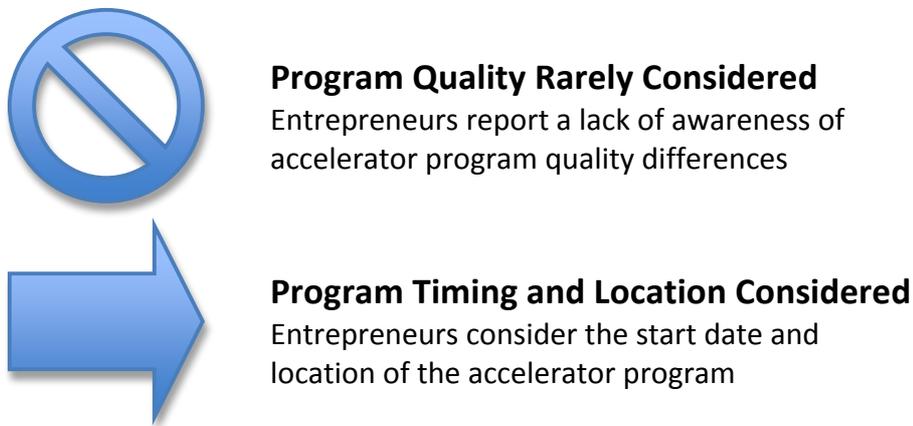


Figure 8. How do entrepreneurs select accelerators?

(Hallen, Bingham, & Cohen 2017)

This thesis aimed to create a tool that entrepreneurs could use to evaluate accelerators by taking into consideration of the program quality. This decision-making framework was designed to show entrepreneurs which accelerator designs are linked to positive outcomes for participating companies and which metrics researchers have been shown to be relevant for identifying top accelerators. The framework could be used by entrepreneurs to evaluate accelerators with logic and data rather than emotion and bounded rationality.

3 Methodology

3.1 Research method

The aim of this thesis was to explore the existing knowledge regarding the outcomes for participants in business accelerators. The author was interested in the value this knowledge could bring to entrepreneurs, and this guided the author to evaluate the literature from the perspective of what existing research-based knowledge could be helpful to entrepreneurs who are considering accelerator programs as a pathway to business growth.

The author worked from a pragmatic and exploratory approach to gather and analyze data. Pragmatism argues that the most important philosophical determinant is the research question (Saunders, Lewis & Thornhill 2009). In this case, an integrated

literature review was conducted to gather the most recent insights discovered by researchers studying the accelerator phenomena. The initial selection of literature was located through Google Scholar, ResearchGate, and Emerald searches of the keywords business accelerators, incubators, business accelerator success, and business support services. Subsequent articles were located by searching for the articles cited in the initial literature review as well as searches for the additional studies by the authors cited in the initial literature. The research on the availability of public source metrics was conducted based on the databases cited in the literature.

The author chose to collect data from secondary sources taken from published literature and online databases because the objective was to understand which accelerator design factors have been shown by research to lead to improved business outcomes. The literature revealed that the primary data was collected by a number of researchers using a mixed methods, longitudinal approach (Tashakkori & Teddlie 1998). Across multiple published papers, those researchers have evaluated quantitative metrics such as website traffic, investments, and size of networks as well as qualitative data gathered through semi-structured interviews and surveys. The author of this thesis used a mono-method, literature-based approach to gather, evaluate and organize the secondary data from various published sources. The author then used that data to construct a framework to illustrate the metrics that researchers have shown most likely to have a positive impact on business outcomes following accelerator participation.

At the beginning of this project, the author considered gathering primary data via surveys or interviews, however, the literature review revealed that much data on motivation for accelerator participation and satisfaction levels of accelerator participants has been conducted. The author became interested in exploring the impact of accelerator participation—and more specifically the impact of accelerator design—on tangible business outcomes such as securing funding, reaching development goals, and exits. Measuring business outcomes requires a long-term, longitudinal approach (Saunders et al. 2009) as businesses take time to develop, grow, and reach an exit. To determine accelerator design factors and their impact on business outcomes has required researchers to obtain confidential access to multiple programs and follow participants for several years to begin to develop insights and statistically significant conclusions regarding the impact of program design on business outcomes.

During the literature review, the author discovered that there were several longitudinal studies that considered various aspects of accelerator program design. These studies provided insights into the accelerator program designs that were tied to positive and negative business outcomes. The literature review also revealed that there was not yet a framework that presented the knowledge generated by the published research in a manner easily accessible for entrepreneurs. Thus, entrepreneurs were precluded from easily discovering which accelerator program formats and factors would most likely lead to successful business growth. Therefore, this research sought to gather, evaluate, and create a framework to ensure entrepreneurs could easily access the research knowledge on best practices for accelerator design.

In summary, the research data in this study was obtained from public sources and published research reports. The data was reviewed to align the research results with the public data to draw conclusions regarding the factors that entrepreneurs should consider prior to applying to accelerator programs. The goal was to create a comprehensive understanding of which factors in accelerator programs are believed to lead to entrepreneurial success according to the current research knowledge. Following identification of those factors, the research sought to determine whether or not entrepreneurs could access data on those factors from public sources. Finally, the author created a framework for entrepreneurs to utilize when evaluating accelerator programs.

3.2 Research approach

The key motivation of this thesis was to assess what an entrepreneur should know prior to joining an accelerator and to ascertain what information accelerators divulge prior to an entrepreneur's application decision. Based on the research, what information should an entrepreneur consider and what information do accelerators provide? The approach to complete this task is outlined below.

Step 1. Identify the key factors in accelerator outcomes

The literature review was the first step in gathering information on accelerators. Specific studies were found to hold insights into which factors of accelerator programs led to entrepreneurial success. The author revealed these key factors in the data section of this thesis.

Step 2. Locate sources for key factor metrics

The author identified a number of metrics that researchers have identified as important to accelerator participant success. The author then sought public sources of data to verify which metrics are accessible by entrepreneurs. The Seed-DB website and Crunchbase were identified as the best sources of data for entrepreneurs as they evaluate and compare accelerator programs.

Step 3. Create a framework to evaluate accelerators.

Using the data gathered in steps 1 and 2, the author created a framework that details which metrics to consider and where to obtain the data for each metric prior to applying to an accelerator program.

3.3 Research context

Accelerators are a relatively new phenomena. Consequently, researchers have limited data available to analyze as they seek to determine exactly which attributes of accelerators lead to good outcomes for participants. Despite the complexity of comparing disparate programs serving a wide variety of startups, researchers have sought to provide insights into best practices. Over time, the Seed Accelerators Rankings Project (SARP) has adjusted the metrics used to select the top programs in their rankings, which is described in the Results section. The changes in metrics used for the SARP ranking algorithm illustrate that the field of research on accelerators is young, and one should expect continual adjustments as research reveals the best approach to supporting entrepreneurs with accelerator programs.

Thus, the existing research provides a starting point to consider accelerator program strategies and outcomes. As additional data is collected and additional research reports are published, greater clarity on best practices will be available to the entrepreneurial community.

While SARP provides limited insights into the leading programs, the data and algorithms used to draw conclusions regarding top programs has been hidden from entrepreneurs. SARP has not provided a list of programs considered for the ranking, but they did acknowledge that some programs were omitted from consideration because they did not provide all requested metrics or because they did not meet the

inclusion criteria (Hochberg et al. 2017). Thus, an entrepreneur could conclude nothing regarding the relative quality of a program that is excluded from the SARP list. This thesis sought to identify the metrics and data sources that entrepreneurs could use to evaluate the hundreds of accelerator programs that were not listed in the SARP report.

3.4 Data collection

Data was collected from the published research and from public databases dedicated to tracking accelerator programs, participants, and investors. Details on the data sources are provided below.

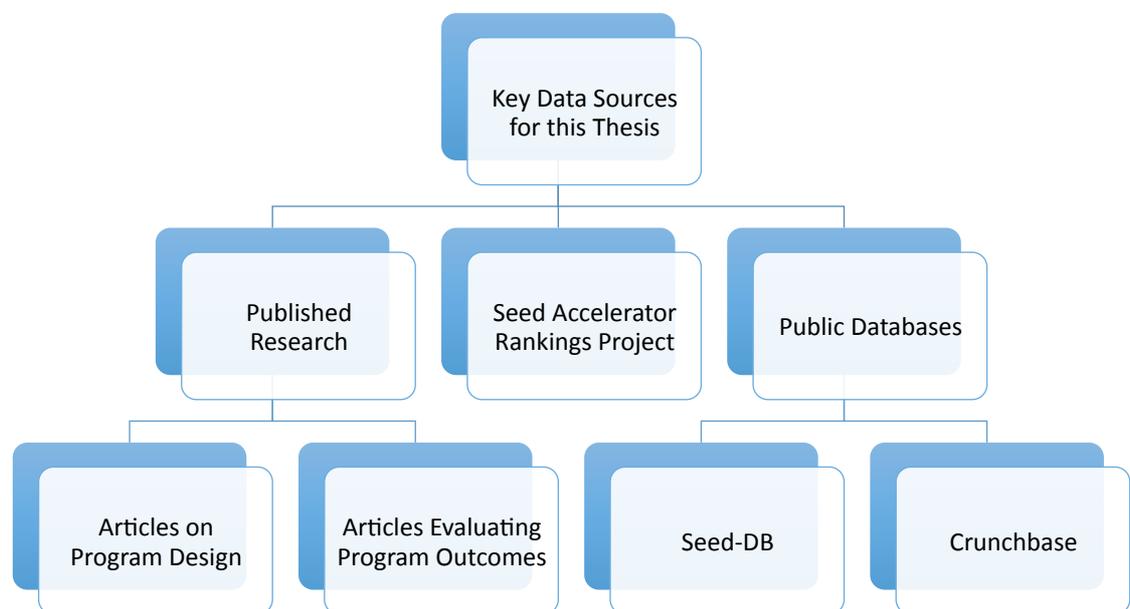


Figure 9. Key data sources included in this thesis

Data on the impact of accelerators on participant companies

Several researchers have been studying accelerator program outcomes and accelerator program design factors that might lead to the best outcomes. While many studies are referenced throughout this thesis, there is a group of researchers whose work appeared repeatedly: Cohen, Bingham, and Hallen (2018); Cohen and Hochberg (2014); Fehder and Hochberg (2014); Hallen, Bingham, and Cohen (2014, 2017); Hochberg, Cohen, and Fehder (2014, 2017); Hochberg (2016).

Hallen, Cohen, and Bingham collaborate on a large-scale, on-going project to assess accelerator programs by cooperating with leading US-based accelerators to access

confidential data from accelerators and participants. In 2014, the group published the journal article “Do accelerators accelerate?” in the *Academy of Management Proceedings*. The article has since been updated and published on ResearchGate. The researchers gained access to proprietary information from the accelerators through the use of confidentiality agreements and relationships built on trust between the researchers, managers, and accelerator participants. The goal of the researchers in this on-going study was three-fold. First, the research considered how accelerators benefit entrepreneurs. Second, the researchers sought to refute literature that suggested accelerators may be counter-productive. Finally, the researchers sought to highlight the program aspects of the accelerator programs that had the greatest impact on the entrepreneurs and their ventures. This data collection and research was centered on a key question: Do accelerators benefit participating ventures, and if so, how? To answer this question, each researcher gathered data and then combined that data in a mixed methods approach (both qualitative and quantitative research methods). This was a large-scale project involving university research leads and teams of graduate students to gather and analyze the data.

The first step involved an inductive analysis of the qualitative fieldwork. The researchers conducted 70 semi-structured interviews of managers, investors, and participants from eight US-based accelerators. The second component of the research project was a quantitative analysis of proprietary data comparing various metrics of the accelerator participants with proprietary data from accelerator runners-up. Gaining an invitation to join an accelerator program considered in this research is highly competitive. The researchers theorized that the runners-up who were almost accepted were of a similar quality to the selected participants. Thus comparing these categories (participants versus runners-up) was useful. The runners-up were essentially the control group and the participants were evaluated to determine how much their ventures grew in comparison to the controls. Then the change in growth was attributed to the participation in the accelerator program. Finally, the researchers evaluated data taken from public sources to evaluate the speed at which the accelerator participants reached key milestones.

Additional articles and approaches to analyzing the data from this large study continued as evidenced by Cohen, Bingham, and Hallen’s 2018 article on bounded rationality.

Data gathered from the Seed Accelerator Rankings Project

Next the author evaluated the data provided by the Seed Accelerator Rankings Project (Hochberg, Cohen & Fehder 2014, 2015, 2017, 2018; Gruber 2012; Schieber 2014). By reviewing the metrics used for the first ranking published in 2012 and comparing them to the metrics used in the most recent 2018 ranking, it was possible to see the changes in which metrics researchers believe lead to participant success. Additional insights into which metrics researchers value were uncovered in the ranking reports.

Data gathered from public databases

As described in the literature section, there are two databases that provide access to public data on accelerators, investors and participants. The author verified that each company listed in the 2018 SARP rankings was also included at Crunchbase. Each accelerator in the SARP rankings had corresponding data available including the number of and size of investments made in individual companies, the size of the alumni network, and the number of exits achieved to date.

The author also used the search function on the Seed-DB database to view each accelerator listed by the 2018 SARP rankings. The goal was to verify the type of information available to entrepreneurs on these third-party websites.

3.5 Plan for research quality and ethics

This section considers the reliability of the secondary data analyzed in this research. Reliability considers how likely it is that the data collection and analysis could be reproduced consistently (Saunders, Lewis, & Thornhill 2009) The secondary data collected in this study was viewed through the lens of the SARP program's ranking system. Thus, the author has relied on the research experience of the SARP team to aggregate data, weight the metrics, and draw conclusions regarding the best accelerator programs. The authors have published their work in peer-reviewed journals and have commented on their data collection techniques, and data validity in those studies. The authors of Management Research pose three questions to evaluate the reliability of data (Esterby-Smith, Thorpe, Jackson, & Lowe 2008). First, "will the measures yield the same results on other occasions?" The longitudinal nature of the data collection gives the researchers the opportunity to consider whether or not their

measurements tend to yield similar results on other occasions. Second, “will similar observations be reached by other observers?” It is not possible to directly answer this question as the data is confidential and not available to researchers outside the SARP team. However, it is noteworthy that the researchers come together from different research institutions and collaborate to publish the findings of their studies. One would anticipate that this collaboration includes debates about the best approach to evaluate the data and draw conclusions. Third, Esterby-Smith et al. (2009) ask “is there transparency in how sense was made from the raw data?” The researchers are careful to detail how the data was collected and evaluated without compromising their confidentiality agreements. Due to the confidential nature of the data, the author was unable to see the raw data and the weighting system algorithm applied to the data to generate the rankings. Rather, the author used the SARP description of the metrics utilized. The author then sought those metrics from secondary sources, primarily Seed-DB. The data at Seed-DB is reflective of data provided by accelerators, participants, and the Crunchbase website. Some of the metrics at Crunchbase are reliable and gathered from industry researchers, such as network size based on the number of participants in various accelerators. However, other data at Crunchbase is provided by accelerator managers or participants. This data is subject to errors due to participant and observer bias and error (Saunders et al. 2008). The framework presented in this thesis suggests the use of data collected from Seed-DB and Crunchbase. Given the knowledge that this data has reliability concerns, when using the framework to evaluate accelerators, it would be wise to look for trends in the data and be mindful that individual data points could be in error.

This thesis relies on secondary data and published research to present a framework that could be used to evaluate accelerator programs. The research ethics followed by the author centered on a commitment by the author to avoid harm to the reputation of accelerators and participants (Saunders et al. 2009). Occasionally the author recognized specific accelerator programs during the literature review, even though the accelerator identity was coded for privacy. Maintaining the confidentiality of accelerators that participated in the confidential research projects was a key aspect of the author’s ethical commitment.

4 Results

Research has increasingly revealed more details about the potential benefits of joining an accelerator. However, the research has also revealed that not all accelerators increase the likelihood of a successful outcome for participating companies. In summary, some accelerators benefit participants, while others seem to inhibit some aspects of development. Leading research projects have evaluated a limited number of accelerators, for example the Seed Accelerator Rankings Project considered 150 accelerators for the 2017 rankings (Hochberg, Cohen, & Fehder 2017). Considering that researchers have estimated over 3000 accelerators exist globally (Hochberg 2016), it is immediately clear that not all accelerators have received a detailed evaluation. Thus, it is up to entrepreneurs to evaluate accelerators and determine whether or not a given accelerator has a strong program designed to foster success. This thesis has gathered evidence from research and publications and crafted a framework for entrepreneurs to utilize when evaluating accelerator programs.

First this results section briefly considers what constitutes success in the context of accelerator outcomes. Next, the author discusses the key factors identified by researchers to foster success. Finally, the author proposed a framework that entrepreneurs can use to select accelerator programs.

4.1 Measuring success

Researchers studying the efficacy of accelerator programs have used various metrics to measure success. Hallen, Bingham, and Cohen (2017) sought to determine whether participants benefitted from their time in accelerators as evidenced by the level of learning and the timelines and likelihood of reaching key milestones in venture development. Cohen, Bingham and Hallen (2018) reveal that accelerator directors have often measured success by profitable exits via initial public offerings (IPOs) or acquisitions. To investigate the impact of accelerators on ventures, Cohen et al. (2018) considered revenue growth, evidence of founder learning, evidence of changes to business model or business strategy, and time to reach key milestones. The literature review revealed that each actor in an accelerator may have had a different method of measuring success. Some have even argued that failing fast is a positive outcome

because it allows the founders to move on to new projects which might have a better likelihood of success.

An entrepreneur must decide what value and benefits he or she hopes to achieve through accelerator participation. The results below will provide insights into the benefits possible through accelerator participation. Furthermore, entrepreneurs could seek programs that are most likely to provide the support needed to achieve team's specific goals for their startup.

If an entrepreneurial team's goal of participating in an accelerator is long-term growth, then the team should consider the study by Hallen et al. (2017). This study revealed that by participating in some leading accelerators, ventures experienced improved long-term outcomes in funding, web traffic, and employee growth. However, some accelerator programs had no impact on these outcome metrics and some accelerator programs "negatively affected some outcomes." Unfortunately, the results were coded to protect the accelerators' privacy. Thus, an entrepreneur is prevented from knowing exactly which accelerators provided long term growth according to the study.

The fact that some accelerators promoted growth is encouraging, but the reality that some accelerators have a neutral or negative impact should inspire entrepreneurs to seek more information and clarity before joining a program. Clearly, not all accelerator programs are beneficial to participants. Given the high commitment level of time and resources from the ventures, it is critical that entrepreneurs understand exactly what they can expect to gain, and take the time to exercise due diligence prior to the application or enrollment in a given program.

4.2 First-hand account of a cohort-based program

The author started a company in 2007. The company developed and grew slowly, and as the author considered the future of the business, she often evaluated the opportunities for accelerated growth that could be accessed by joining business organizations such as accelerators. The business is located in the USA, and the author had periodically visited business support organizations such as incubators and accelerators. The author considered applying to accelerators as a way to increase the author's knowledge, network, and funding opportunities.

In 2013, the author joined a NEXT cohort. NEXT was a pre-accelerator program developed by Techstars—a leading accelerator—in conjunction with Startup Weekend, Steve Blank, and LaunchPad Central (Topalian 2012). The program focused on the Customer Development Model (Blank & Dorf 2011) as well as Osterwalder and Pigneurs's Business Model Canvas (2010). The program was a fee-based program and the cohort of ten companies and six mentors met once weekly for four weeks. The program focused on using the Business Model Canvas to evaluate exactly which problem would be solved by the business and to determine what customers desired. There was a large emphasis on interviewing customers to determine what they needed or wanted from the company according to the Customer Development Model recommended by Blank and Dorf. Participants also watched weekly lectures by Steve Blank delivered via Udacity (Blank & Mullaney n.d.).

NEXT offered a compressed format with a robust curriculum and access to mentors reported to be experienced in running start-ups. Participants were given assignments that required, on average, about 30 hours of focused work each week. The cohort had a variety of entrepreneurs with companies at various stages of development. The mentors were members of the local business community with start-up and angel investing experience. Each team was assigned a mentor and the program culminated in a demo evening presenting each company's progress to investors. Program participants paid a tuition fee, but the program did not take equity in participating companies.

The opportunity to experience a taste of the accelerator model gave the author unique insights into the challenges in pursuing a program which is advertised with considerable hype, but very little clarity into the program's objectives prior to enrollment. Each start-up was matched with one mentor. The author was matched to a mentor who offered quick advice without asking questions, thus the advice failed to consider the company's business model, industry, and customer needs. The lack of attention and interest caused the author to ponder the mentor's motivation for acting as a volunteer mentor.

By the end of the program it was clear that the program mentors were also angel investors who had decided to donate a bit of time for the privilege of seeing business teams up close and to gain potential access to be on the front lines of investing in promising companies. The NEXT mentors' primary interest was to work with the

companies with the greatest potential. Companies with strong teams, interesting products, and a desire for funding received the most time and advice from the mentors, and often interacted with multiple mentors for extended conversations during the weekly cohort meetings. The author was not seeking funding, and consequently, received virtually no consultation time from the mentors.

As mentioned previously, the author paid tuition to participate in the program. The author participated in all of the activities and completed all of the assignments. Thus, the author did experience the benefits of learning from those tasks, however the author failed to gain the potentially valuable advice, connections, or guidance from seasoned mentors.

This experience was the impetus for the author to begin to really question the potential benefits of accelerators from an entrepreneur's perspective. The websites of accelerators are often quite good at recruiting applicants who are told they will gain access to a network, faster growth, and investors. The goal of this thesis was to help entrepreneurs understand how accelerators add value to teams building startups. Additionally, the framework presented was designed to help entrepreneurs consider what aspects of a program have been shown to provide the greatest impact to participants.

Before joining an accelerator, entrepreneurs need to consider what they hope to gain from an accelerator program. Then, they can use the provided framework to understand what an accelerator program is offering. Entrepreneurs should count the cost of participation in terms of time and equity that will be committed to the accelerator program.

4.3 Impact of accelerators on founder learning

Hallen, Bingham and Cohen's study (2014, 2017) assessed the impact of eight leading accelerators through research on 37 participants. Through this research, a clearer picture emerged showing which aspects of accelerator programs bring the most value to participants. While the research is coded to protect the privacy of the accelerator programs and participants, the results enable an entrepreneur to consider the factors that are most relevant for their business needs.

Evidence of founder's learning

The researchers (Hallen et al. 2017) assert that the value participants gain through accelerator participation is linked to the learning-oriented practices of the accelerators. Hallen et al. defined learning as the “processing of information that changes an organizations’ cognition or range of potential behaviors.” Learning-oriented practices include mentorship, seminars, and peer interactions. Hallen et al. sought to ascertain whether or not founders who participate in accelerators were learning. Learning was evidenced by changes to business model and strategy, or changes to the venture’s customer base, or by changes to the venture’s revenue strategy. The findings of the research indicated that the strategic changes were typically a result of advice from mentors rather than from feedback obtained through trial and error experimentation.

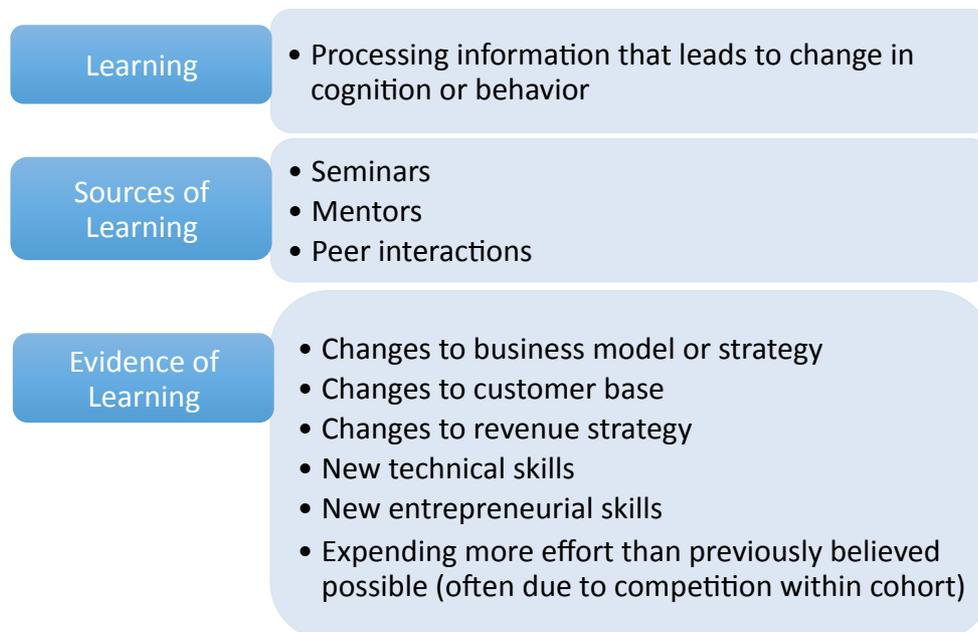


Figure 10. Founder learning in accelerator programs
(Hallen, Bingham, & Cohen 2017)

The learning happening in accelerators was largely attributed to discussions and consultation with mentors, customers, members of the cohort, seminar speakers, and program directors. The broad range of people with whom accelerator participants interacted and the intensity in volume and pacing of those consultations was significant as discussed in section 4.4 on accelerator design.

Mindset and learning

The Startup Genome Report (SGR) surveyed entrepreneurs to understand the mindset of accelerator participants. They reported that the number of times a founder participated in an accelerator impacted the value derived from the program. Specifically, SGR reported that entrepreneurs who had joined three or more accelerators tended to have a structure mindset, which meant the entrepreneur had a “preference for planning and organizing before starting on a task” (Gauthier, Stangler, Penzel, & Morelix 2018.) The structure mindset correlated to venture failures. In contrast, entrepreneurs who had attended zero or one accelerator program scored high on the initiation mindset, which meant the entrepreneur had a “proclivity and energy level to start new things, to turn ideas into action.” Venture success was positively correlated to the initiation mindset. The conclusion reached by SGR is that the founder’s mindset and focus was critical to successful outcomes. “The latter finding seems intuitive: founders who go through at least three accelerator programs seem to be seeking some sort of structure or guidance. Structure, however, is negatively correlated with startup success: comfort with ambiguity, not an orientation toward planning, is an early-stage asset.” (ibid. 2018.)

Thus the findings highlight two keys to accelerator success. Accelerators should foster learning, and participants need the proper mindset to receive the learning and guidance likely to drive successful outcomes.

4.4 Accelerator design

According to research released in 2018 by Cohen, Bingham, and Hallen, the format of an accelerator was critical to the eventual outcomes. Cohen et al. evaluated the intensity of consultation between participants and mentors, the transparency of interactions amongst members of the cohort, and the level of customization provided by accelerator programs. The research showed that specific structures lead to successful outcomes for entrepreneurs.

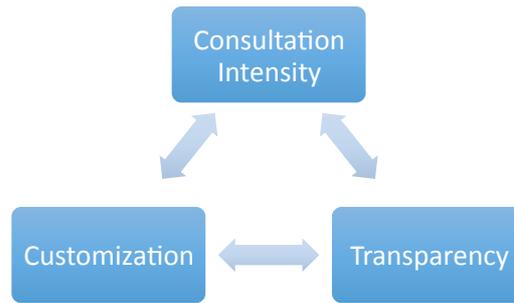


Figure 11. Accelerator design considerations. (Cohen, Bingham, & Hallen 2018)

Consultation intensity

Accelerators provide participants with access to mentors. Research by Cohen et al. (2018) found a significant correlation to successful outcomes among accelerator programs that followed an intense schedule of consultation at the beginning of the accelerator program. The accelerators that front-loaded the consultations with mentors and had a high intensity of meetings early in the program were more likely to lead to successful outcomes for participants.

Research by Cohen et al. (2018) did not list the names of any specific accelerators, however, one example of a leading accelerator known to front-load consultations is Techstars. The Techstars accelerator programs are three-months long and the first month is known as “Mentor Madness” because participants meet with mentors all day, everyday. Gradually, each team determines which mentors are the best fit for their team and also select at least one lead mentor. Participants have reported a phenomena known as “Mentor-whiplash” occurred due to conflicting views on what actions a start-up should take that left participants feeling as if they were shifting direction rapidly and repeatedly. (Wilbanks 2016.)

Interestingly, Cohen et al. (2018) theorized that it was this overload of advice that yielded the positive benefits of front-loading. During this period of intense consultation with mentors, entrepreneurs received lots of feedback and advice regarding their company. Due to the full schedule, the entrepreneurs could not take action on all of the advice and therefore were forced to prioritize and adapt quickly. Contrast this with the alternative model of paced-consultation in which consultations with mentors occurred at a steady pace throughout an accelerator program.

Entrepreneurs in this type of program may have had several days to act on advice of a mentor only to be redirected a few days later by another mentor. Having too much time to follow advice had a negative impact on outcomes for participating companies. Additionally, as noted in section 4.2, the level of learning that entrepreneurs achieved during an accelerator program appeared to be closely tied to the mentorship meetings.

Disclosure

Evaluating accelerators for transparency revealed that programs which are designed to foster transparency between entrepreneurial teams led to better outcomes (Cohen et al. 2018). The researchers noted that two approaches have emerged in accelerator program design. The first approach fostered privacy such that the teams within a given cohort protected their private information regarding performance and actions taken. Teams in the cohort were encouraged to develop relationships within the cohort and shared private information only as they become comfortable. In their research, three of the accelerator programs fostered privacy, which correlated to lower performance.

Accelerators that foster privacy tended to offer private offices or in an open office, they had plenty of open buffer space between teams. Events were often informal opportunities to mingle, and teams were not required to share information with their peers in the cohort. Progress reports on product development and pitches were delivered to mentors or managers in private.

The second approach fostered transparency such that teams within a given cohort were encouraged to share information. Interestingly, not all accelerators fostering transparency included shared office space. However, in accelerators fostering transparency, there were formal systems in place to ensure all teams shared their progress towards business development. For example, teams might have publicly stated their weekly goals and then shared their accomplishments. Teams often presented their pitches to the cohort and received feedback for refinement.

One outcome of the transparency was that teams reported working harder due to the peer pressure as well as the inspiration derived from seeing peers accomplish goals. Another outcome of transparency was that teams reported revisiting their business model and strategy. Some entrepreneurs reported that they felt their model or strategy was adequate, but through learning gathered in the transparent environment, they

found reason to rethink, to research, and to adjust their model or strategy to improve performance.

Teams also reported learning by observing teams that were more advanced in some areas. Teams benefitted from the sharing of each cohorts' expertise so that learning was accelerated and access to knowledge and experience was close at hand. For example, one team might be highly skilled at fundraising and another at software development. In accelerators fostering transparency, members of the cohort reported sharing expertise and receiving advice from other teams as a valuable aspect of the program.

Finally, in accelerators fostering transparency, teams also reported learning about strategies that should be avoided. By observing failures or significant challenges experienced by another team in the cohort, an entrepreneur might recognize that the strategy was flawed and avoid testing it altogether. Learning what not to do by viewing the failures of others was a great benefit to participating companies in transparent accelerator model programs.

Customization

The third design element considered by Cohen et al. (2018) was the level of customization in accelerator programs. They noted two different approaches to organizing the accelerator program. Some programs were highly customized such that entrepreneurs had the ability to individualize the program. Some accelerators allowed the participants to select their own mentors, choose which seminars to attend, and offered flexibility on when they met with the peers in the cohort. Other programs were standardized such that the mentors were assigned, attendance at seminars was required, and meetings within the cohort were scheduled and required. Cohen et al. cited several studies that indicated customization could help ventures, but noted that their own research revealed that the accelerators that tailored the activities and participation to the desires of the participants had lower performance than the accelerators that followed a structure of standard activities in a prescribed sequence.

Entrepreneurs participating in accelerators with a standardized format were forced to attend to all aspects of their business during the seminars and mentor meetings, even if they felt those aspects of the business were already fine-tuned. The standard format also ensured that each venture was exposed to a wide range of information sources.

Entrepreneurs in standardized programs were able to explore broadly and consider a greater range of solutions for each problem encountered during the accelerator program.

In searching for an accelerator program, entrepreneurs should seek programs with a fixed program of learning opportunities including seminars and mentor meetings. Cohen et al. suggest that companies required to attend all aspects of the pre-planned program were forced to consider aspects of their business that seemed fixed, but perhaps were in need of reconsideration. Thus, entrepreneurs should avoid programs with high customization as those have lower success rates than programs with fixed programs.

4.5 Accelerator rankings

The Seed Accelerator Rankings Project (SARP) has sought to provide entrepreneurs with clarity regarding which accelerator programs have had the best track record of success (Hochberg, Cohen, & Fehder 2017). SARP conducted extensive fieldwork to determine the leading indicators of entrepreneurial success. The organization then created weighted metrics to compare accelerators and award the top accelerators with recognition on the Seed Accelerator Rankings Project website.

The SARP project began as a part of fieldwork by Aziz Gilani under the direction of Yael Hochberg. Hochberg continued the project after 2012. Of interest to this thesis was the evaluation process used to rank the accelerators over the past eight years.

Hochberg, Cohen, and Fehder (2016, 2017, 2018) stated that their goal in ranking the accelerators was to foster conversation and “to provide greater transparency regarding the relative performance of programs along multiple dimensions that may be of importance to entrepreneurs.” Working from a position of a neutral third party gave Hochberg et al. access to sensitive proprietary data, which allowed them to compare programs and provide insights regarding which factors led to success. Hochberg et al. were motivated to increase transparency in the accelerator industry because they recognized that participation in an accelerator comes at a high cost to entrepreneurs. Programs commonly take a 5-10% equity stake in exchange for a seed investment of \$20,000-40,000. In the view of Hochberg et al., equity is the entrepreneur’s most valuable currency and therefore, an entrepreneur needs to have confidence that the value attending a program will lead to positive outcomes.

Thus, the work in the Seed Accelerator Rankings Project is completed with the entrepreneur in mind. Hochberg et al. are evaluating accelerators based on the metrics believed to link closely to the improved outcomes desired by participating entrepreneurs. While Hochberg et al. strive for transparency, they did not reveal the algorithm used to rank accelerators. They did, however, provide a list of the metrics considered each year, as discussed below.

To determine leading accelerators, the ranking project had a limited scope of consideration. To qualify for consideration, programs must have been located in the USA and they must have functioned as a fixed-term, cohort-based program that offered education and mentorship. Additionally, the program cohorts must have culminated in a demo day or a public pitch event. Consideration for SARP ranking was by invitation only, and in 2018, 160 programs were invited to submit their data for consideration and ranking. The final 2018 ranking lists 26 accelerators, as shown in Figure 12. Prior to 2016, accelerators were ranked numerically, but since 2016, accelerators have been placed into tiers as shown in Figure 11 and programs within each tier have been considered to be of similar quality.

Over time, the metrics used for ranking accelerators have shifted considerably. For example in the earliest years of the ranking Gilani, Hochberg, and Kamath (Gruber 2012) considered the reputation of an accelerator program in the venture capital community and equity taken by the accelerator in participating companies. The ranking team and metrics have shifted over the years. The metrics evaluated for the 2012 ranking list are shown in Table 3.

As time passed, the researchers have continued to modify the ranking algorithm based on new research illustrating the factors that led to success. From 2013 to 2017, the reported metrics for ranking accelerators was consistent, however in 2018, the size of the alumni network was added back into the ranking system.

Table 3. Adjustments to SARP's selected metrics over time
(Hochberg, Cohen, & Fehder 2014, 2015, 2017, 2018; Gruber 2012; Schieber 2014)

2012 Metrics	2013-2017 Metrics	2018 Metrics
	Valuation	Valuation
Qualified Fundraising	Qualified Fundraising	Qualified Fundraising
Qualified Exits	Qualified Exits	Qualified Exit
	Founder Satisfaction	Founder Satisfaction
	Survival	Survival
Alumni Network Size		Alumni Network Size
Reputation with Venture Capitalists		
Equity Taken (Stipend)		

Metrics used by SARP to evaluate accelerators are detailed below. SARP looked at the historical performance of companies that had already participated in each accelerator program. The framework presented in section 5.1 on page 54 could guide entrepreneurs to consider an accelerator's record based on these metrics. Thus, an understanding of what each metric assesses is warranted. SARP noted that the algorithm used to rank the accelerators gave higher weight to the metrics of valuations, fundraising, exits, and founder satisfaction. (Hochberg, Cohen, & Fehder 2018)

Valuations: The valuation of companies can be determined when a company obtains priced financing. Valuations of successful companies tend to increase over time, so the SARP program considered the valuations at one year, two years, and three years from accelerator graduation in order to give proper consideration to newer accelerator programs. If a company had not had a priced funding round, then it was valued at zero. SARP did two evaluations, one for all graduates and a second rating that only considered companies that had had a priced funding round.

Qualified fundraising: SARP was interested in how many companies were able to raise a round of funding in the year following the accelerator graduation. The ranking assessed the percentage of participants who raised more than \$200,000 in the year following their graduation and the percentage who raised money at any time since

graduation. SARP also considered the amount raised by graduates of the programs. In 2015, Hochberg, Cohen, and Fehder reported that, from the programs listed in the ranking that year, 35.6% of prior participants had raised a significant round of financing within the first year of graduation, and the average raise was \$1.5 million.

Qualified exits: SARP considered the companies who had achieved a qualified exit, which they defined as an exit valued at \$5 million in excess of raised capital or an initial public offering (IPO). They noted that only 2.1% of companies in the SARP sample had reached the qualifying exit milestone (Hochberg, Cohen, & Fehder 2018).

Founder satisfaction: SARP surveyed accelerator participants to determine whether they would repeat their accelerator experience and whether or not they would recommend the accelerator to others. In 2014, SARP reported that 90% of surveyed participants said they would repeat the accelerator experience and 95% percent reported they believed it was worth the equity they gave up to participate (Shieber 2014).

Alumni network: The alumni network has often been listed as an important consideration for joining accelerators. The metric was part of the SARP evaluation in 2012, but was absent from consideration for the five-year period of 2013-2017. The inclusion of alumni network again in the 2018 rankings indicated that SARP was once again giving value to this metric as a factor in participant outcomes. The ranking considered how many companies had graduated from the accelerator. SARP highlighted that the alumni network was an asset that provided participants with access to future business development contacts and resources.

Survival: This has been a controversial metric. Some have argued that if a company is doomed to fail, it is best to fail fast, and that failing fast and learning from it should be an acceptable outcome for accelerator participants. Given that the metric has been controversial, SARP stated that they gave this metric a lower weighting in the ranking system. They evaluated the survival of participating companies at one, two, and three years after graduation.

Finding the data on accelerators

SARP is sending lots of clues regarding which metrics matter. At the latest report in 2018, SARP ranked accelerators based on six metrics. The majority of the metrics

SARP used to evaluate accelerators can be accessed from the Seed-DB website, as shown in Table 4. (Christiansen 2019).

As shown in Table 4 below, an entrepreneur can obtain data on five of the six metrics via the Seed-DB website. The only metric not listed on Seed-DB is founder satisfaction. While SARP does not publish the founder satisfaction survey results, they do report very high satisfaction ratings of greater than 90%. If an entrepreneur is keen, he or she could reach out to founders and independently ascertain how founders felt about their participation in a given accelerator program. One can also search for blog posts, LinkedIn posts, and podcasts to hear from founders on their experience with accelerators. Participating companies are listed on the Seed-DB website, so it is relatively easy to track down the company, and reach out to founders for insights and feedback on their experience with the accelerator program. Again, as noted already, the vast majority of founders reported satisfaction with the accelerator programs in the SARP research.

Table 4. Where are metrics available? (Christiansen 2019)

2018 Metrics used by SARP to rank program	Location of Data
Valuation	Available on Seed-DB
Qualified Fundraising	Available on Seed-DB
Qualified Exits	Available on Seed-DB
Alumni Network	Available on Seed-DB
Survival	Available on Seed-DB
Founder Satisfaction	Not available from public database.

Because the data is available on Seed-DB, entrepreneurs could utilize the framework developed in this thesis to evaluate accelerators prior to applying. However, this data would only be truly useful for accelerators that have had a history of several cohorts. For new accelerators, it would be more difficult for an entrepreneur to assess the likelihood of success based on available metrics. In those instances, the entrepreneur could rely on the research regarding the design of an accelerator rather than relying on data regarding historical outcomes.

4.6 Cognitive biases

While research has begun building an understanding of how accelerators could benefit entrepreneurs, the effort needed to discover and apply the knowledge to a specific entrepreneur's situation could be significant. As noted in the literature review, Cohen (2014) revealed that many entrepreneurs claimed to have selected their accelerator program based on the convenience of the program's start date and location. This statement highlighted a tendency to invest very little cognitive effort in determining the potential value of a program to an entrepreneur's venture.

In the case of leading accelerator programs, programs have been able to attract large numbers of applications even though applicants can gather very little data on the program via the program websites. Instead of giving individuals a robust store of data to evaluate prior to submitting an application, the accelerators have relied upon the social proof and "cognitive miser" biases to ensure a large pool of startups will apply for their programs. Accelerators have not provided detailed proof of their potential value for an organization, rather, the ecosystem has promoted the accelerators and entrepreneurs have defaulted to their "cognitive miser" state to make snap decisions to apply because the programs were reported (by others) to be good enough. (Cohen, Bingham, and Hallen 2018.)

The reality is that entrepreneurs have had incomplete information about accelerator programs. They have also lacked information on which aspects of accelerator programs have led to positive outcomes for participants. Entrepreneurs have had access to some signals that imply the potential benefits of leading programs. For example, programs listed in the Seed Accelerator Rankings Project or programs belonging to industry organizations such as GAN have appeared favorably, but the reality of these organizations' ability to foster success has remained opaque. Thus, there has been a need for a framework to evaluate accelerators based on the factors shown by researchers to impact outcomes for participating ventures.

4.7 The framework to evaluate accelerators

Accelerators are businesses that partner with startups to help them develop and obtain investors. Founders and managers of accelerators have access to a wide range of business ideas and start-up teams. Accelerators can filter through large numbers of

candidates and be on the ground floor of any investment opportunities for especially interesting ideas or remarkably talented teams (Hochberg 2016). Ultimately, accelerators are investors who work together to pool funds, evaluate lots of young companies, and reduce their risks and increase their rewards by working in close proximity with founders for an extended period to better understand the potential of the founding team and their ability to develop ideas into products.

Research has revealed key attributes of accelerators and how those attributes were linked to program outcomes. To be informed is to be prepared. Thus, this framework was designed to inform entrepreneurs regarding accelerators and the metrics most important to consider prior to application or enrollment in a given program.

While the SARP rankings provide entrepreneurs with confidence on the quality of the 26 listed programs, entrepreneurs who are considering one of the hundreds of unranked accelerators could use this framework to assess those programs. The competition to join top-ranked programs is fierce, and the likelihood of an entrepreneur gaining access to an unranked program is far more likely. Accelerators are businesses and entrepreneurs need to enter into the business relationship with accelerators with a clear understanding of how the program can help the entrepreneur achieve his or her goals.

As noted in the literature review, the accelerator phenomena is still relatively new. Thus, metrics to evaluate their effectiveness are still emerging. To date, researchers have identified key elements that have contributed to accelerator participant success. Entrepreneurs could utilize the following framework to evaluate accelerator programs to gauge the likelihood that the program would provide the young startup with the support needed to successfully navigate and accelerate the early stages of company development.

Experience of the entrepreneur

The learning-oriented practices of accelerators, including mentorship, seminars, and peer interactions, were the aspects of the accelerator that created value for the participants (Hallen, Bingham & Cohen 2014, 2017). The findings of the research indicated learning could be signaled by strategic changes to business model, customer base, or revenue strategy. These changes were typically a result of advice from mentors rather than from feedback obtained through trial and error experimentation.

Research has shown that entrepreneurs benefitted the most from accelerator participation on their first or second time through a program. Entrepreneurs seeking to participate in three or more cohorts tended to be focused on seeking structure rather than seeking learning regarding the initiation phases of growing a new company (Gauthier, Stangler, Penzel, & Morelix 2018).

Program structure

Research revealed that the program design had an impact on outcomes. To access programs with the best practice program design, entrepreneurs should seek a program with the following attributes:

1. Consultations with mentors are front-loaded. Participants meet with many mentors early in the program with high intensity. Some programs report more than 35 meetings a week during the first month of the program.
2. Transparency is fostered. Participants are expected to share goals, progress, challenges, and data with other members of the cohort.
3. Standardized format. The accelerator program has a set schedule and participants are expected to attend all seminars on a broad range of topics. Participants are expected to meet with assigned mentors. Customization is minimized.

Program metrics

Once an entrepreneur has identified an accelerator, he or she should review the historical record by visiting Seed-DB. Seed-DB provides data on 190 accelerators. Much of the data on Seed-DB is pulled from Crunchbase, and there are convenient links to view the details at Crunchbase for each listed company. Seed-DB allows entrepreneurs to easily view all of the companies that have participated in an accelerator program and gain insights into the outcomes for participants. The data at Seed-DB is not comprehensive. They rely on accelerators and participating companies to provide the data and update Crunchbase. For many companies that have reached an exit, there is no valuation data available. Companies that were acquired may have released information on the price of acquisition, but for many companies the exit values are speculative or not reported at all.

Despite these shortcomings, entrepreneurs can learn a lot by viewing the provided data on participants at Seed-DB. When considering an accelerator program, it is wise to gather as much information as possible on the historical performance of the accelerator and its participant companies.

To provide an idea of the type of data available on Seed-DB, reference Table 5 shows the data listed on Seed-DB for two accelerator programs. The accelerators selected for this sample come from the 2018 SARP ranking. Y-Combinator is ranked in the top tier, Platinum Plus, of the SARP ranking. As noted earlier Y-Combinator was the original accelerator and has a huge alumni network and has seen many successful exits. In contrast, The Branderly is listed in the lowest tier, Silver, of the SARP ranking. As mentioned in the literature review, inclusion in the SARP ranking is competitive as 160 accelerators were invited for consideration and only 26 were placed on the ranking list in 2018.

Table 5. Examples of data available at Seed-DB (Christiansen 2019)

	Y-Combinator 2018 Platinum Plus SARP	The Branderly 2018 Silver SARP
Year Founded	2005	2010
Alumni Network Number of companies	1801	44
# Exits	260 (14.4%)	14 (31.8%)
\$ Exits Total for all exited companies	\$5,906,233,100	\$0*
State: How many died? # dead (% dead)	119 (6.6%)	12 (27%)
Survival (# of companies - # dead)	1682 (93.4%)	32 (73%)
Average \$ (Valuations)	\$16,430,063	\$2,153,886
\$ Funding Total	\$29,590,543,510	\$94,771,014

*Exited companies were acquired and no public data available on the value, thus a zero is reported.

Data collected from Seed-DB (Christiansen 2019)

How to access the data on Seed-DB:

1. Visit the accelerators tab on Seed-DB (<https://www.seed-db.com/accelerators>) Search for the accelerator you are interested in evaluating. (Use the Find feature of your internet browser for assistance.)
2. Gather the overview information on the accelerator from the /accelerators page. This page displays the following data:
 - a. Location.
 - b. # Co's — number of companies that have been through the accelerator, which equals the alumni network size.
 - c. \$ Exits — total estimated value of exits for all exited companies from the accelerator.
 - d. \$ Funding — total value of raised financing for participant companies. Data taken from Crunchbase.
 - e. Average \$ — Average funding for companies in the accelerator with data listed on Crunchbase.
3. Click on the name of the accelerator to visit the data page specific to that accelerator. For example to visit the Y-Combinator page (<https://www.seed-db.com/accelerators/view?acceleratorid=1011>). This page displays the cohorts and companies that have participated in the accelerator.
4. Gather data on the following metrics from the top section of the page:
 - a. Date established.
 - b. Average funding invested and equity stake taken.
 - c. Number of exits.
 - d. Total estimated value of all exits.
 - e. Total funding raised by participating companies.
5. Select “View All Companies” to see all of the companies that have been through the selected accelerator program. On this page you will see the accelerator and select the name of the accelerator to view the various cohorts and the companies that have been through the accelerator. You will see data on exits, and failed companies as well as the exit values for those that exited. Gather the following data points:
 - a. **State** — this metric reveals whether the company is dead, alive or exited. Use the find feature of your browser to quickly search for “dead” and

identify how many companies did not survive. Calculate the percent dead.
 (# dead / # startups funded *100% = % dead)

- b. View the **exit value** for each company. The exit values are estimates and confidence of the accuracy is given by ratings of Low, Medium and High.
- c. View the **funding** to see the amount of financing each company raised. The value comes from Crunchbase.

Validation

Additional opportunities to validate the potential of an accelerator come by referencing rankings and membership in industry organizations. As discussed at length, SARP was administered by researchers who relied on historical performance data to select the accelerators on their list. Selecting an accelerator ranked by SARP is one way to ensure that you are selecting a program that has undergone scrutiny by the SARP research team who have determined that the program has a history of generating successful outcomes for many participants. The programs on the 2018 SARP rankings list are displayed below. (Hochberg, Cohen, & Fehder 2018)



Figure 12. Companies listed in Seed Accelerator Rankings Project 2018.
 (Hochberg, Cohen, & Fehder 2018)

Admission into the accelerators listed by SARP is highly competitive. All SARP accelerators are based in the US, though some do have overseas branches, such as

Techstars. Entrepreneurs who wish to broaden their search should turn to programs listed by the Global Accelerator Network (GAN). As discussed in the literature review, GAN is an invitation only organization that strives to help accelerator programs develop best practices aimed towards maximizing success of the accelerator ecosystem. There are over 100 GAN accelerators located around the world (GAN 2017).

GAN reported that over 9400 startups have participated in GAN accelerators with a survival rate of 85%. Furthermore, GAN claimed that most startups raise significant seed capital with an average funding of over \$750,000. Furthermore, GAN has worked to maintain the quality of the accelerators in their organization with a focus on connecting founders to “strategic support, human and financial capital, and unparalleled networking and connections” (GAN 2019). For reference, of the 26 accelerators listed on the 2018 SARP ranking list, seven belong to the GAN organization: MuckerLab, Techstars, AlphaLab, Brandery, Capital Innovators, and Lighthouse Labs.

5 Conclusions and Discussion

5.1 Integrative Model for Accelerator Assessment

When considering participation in an accelerator program, an entrepreneur should consider personal characteristics and goals, the program format, and the historical performance of the program. The framework presented below was based on the features of accelerators that researchers have shown to increase positive outcomes for participants in accelerator programs.

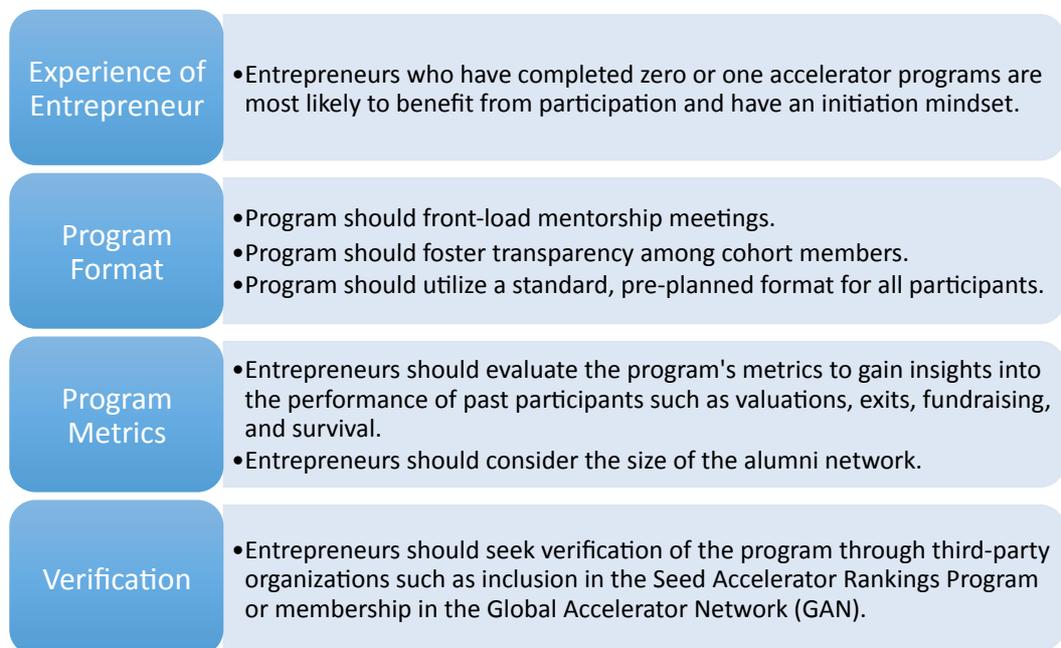


Figure 13. Framework to evaluate accelerators

5.2 Answers to the first research question

The first question asked by the author was: What program model should an entrepreneur seek when applying to an accelerator? Entrepreneurs could utilize the framework provided in section 5.1 to investigate accelerators and select a program with a history of success that meets their specific interests and needs. The developed framework shows what program model an entrepreneur should seek when applying to an accelerator.

Entrepreneurs should consider their own personal history with accelerator programs. Research indicated that entrepreneurs who had already participated in two or more accelerator programs tended to have a structure mindset which caused them to prefer planning and organizing prior to initiating tasks. These entrepreneurs were said to be joining accelerators to seek a level of structure and guidance that was negatively correlated with success. In contrast, entrepreneurs participating in their first or second accelerator program tended to have an initiation mindset that was indicative of a tendency to take action and start new tasks. The initiation mindset was positively correlated with success. In light of these findings, entrepreneurs considering accelerators should consider their own mindset and motivations for participating in an accelerator program.

Next, entrepreneurs would do well to investigate the program design and select accelerators that use the models shown to correlate to successful outcomes. Accelerators that stacked the front end of the program with a heavy schedule of mentor meetings were correlated with successful outcomes for the participating companies. The theory was that entrepreneurs gathered lots of advice and had to filter the advice and make rapid decisions on the actions to take. Entrepreneurs also benefitted from programs with a standardized education program. Due to the required participation in organized educational events, entrepreneurs were given the opportunity to reconsider every aspect of their company. Sometimes those considerations led to important strategic changes in areas the entrepreneurs had previously believed to be firmly established. Finally, the researchers found that programs that required transparency between the companies in the cohort were more likely to have successful outcomes than programs that fostered privacy. Companies in transparent programs reported learning from the experiences and expertise of fellow cohort members. Companies also reported feeling inspired by the intensity of others in the group, which led to an increase in their ability to work longer and harder on company development tasks. The cohort relationships became a part of the larger alumni network. Researchers indicated that the alumni network was important for future development needs and business deals. Seeking accelerators with a large and active alumni network would be prudent for entrepreneurs as the network could provide ready access to funding, talent, and customers.

The final section of the framework recommends that entrepreneurs seek programs that are vetted in some way by third-party evaluators. The Seed Accelerator Rankings Program uses an extensive data analysis to determine which accelerators are worthy of being listed. Entrepreneurs would do well to consider the programs listed by SARP. Another source of third party vetting for accelerator programs is the Global Accelerator Network (GAN), which is an invitation-only network of leading accelerator programs. Membership in GAN indicates that an accelerator is committed to GAN's founder-first mindset. GAN also coordinates lessons learned among their accelerator members leading to shared knowledge to develop best practices in member accelerators. Also, by selecting a GAN accelerator, an entrepreneur may increase the likelihood of networking with other GAN accelerator mentors, alumni, and investors around the world.

5.3 Answers to the second research question

The second research question posed by the author was: Where can entrepreneurs locate the data that will allow them to evaluate the track record of a given program prior to submitting an application? During the course of this research, it was revealed that entrepreneurs could use public data sources to gather metrics on accelerator programs. Entrepreneurs could then consider those metrics as a part of their evaluation of accelerator programs. Researchers have indicated that the following metrics are useful when evaluating the quality of an accelerator program: Alumni network, the number of exits, the value of the exits, the survival rate of participating companies, the average valuations of participating companies, and the total funding of participants. After entrepreneurs gather these metrics, they could determine their own level of comfort with the historical results the accelerator has generated for participating companies. Clearly, using data on performance is a more logical approach to selecting a program than entrepreneurs have reportedly used in the past. As noted earlier, researchers indicated that entrepreneurs tended to be unaware of accelerator program quality differences and instead reported selecting accelerators based on the start date and location of the program.

Entrepreneurs can access the metrics to evaluate 190 accelerators on Seed-DB.com. Metrics for additional accelerator programs may be available on Crunchbase.com. Researchers indicated that more than 90% of founders were satisfied with their

participation in accelerators and would recommend the experience to others. Entrepreneurs could reach out to former accelerator participants and ask them about their experience in accelerator programs. Given the knowledge that founders have been quite satisfied in research surveys, negative reviews from accelerator participants would be a red flag. If an entrepreneur were to discover a high percentage of former participants had been disappointed with an accelerator, it would be wise to investigate further prior to enrolling in that program.

5.4 Practical and managerial implications

Entrepreneurs have ample opportunities to pursue admittance to accelerators in their quest to obtain access to guidance, education, and networks to help grow their startup. The accelerator model is a recent phenomena that has gained significant traction. As entrepreneurs consider applying to an accelerator, they could reference this research and the resulting framework to start evaluating programs that could be beneficial to their firm.

This thesis gathered data on the factors entrepreneurs should consider prior to joining an accelerator. Furthermore, this thesis highlighted where entrepreneurs can access data on accelerators during their evaluation process. Entrepreneurs invest considerable time and equity to participate in accelerator programs, and it is in their interest to spend time evaluating the programs prior to applying and joining. This thesis could guide entrepreneurs in that evaluation process.

5.5 Theoretical implications

The literature review highlighted that entrepreneurs have reported using metrics of convenience to determine which accelerators receive their application. For example, Hallen, Bingham, and Cohen (2017) reported that entrepreneurs select accelerators based on the program start date and/or the location of the accelerator program. The framework presented in this thesis provides entrepreneurs with a more robust set of metrics to guide the application and selection process in the hopes that a given company's approach to choosing an accelerator would be aligned with accelerator best practices as revealed through data and research.

The framework developed in this thesis was based on research studies as discussed in the literature review and data sections. Researchers continue to study the accelerator

industry, and as noted in the data analysis, best practices are developing over time as researchers identify the metrics aligned with successful outcomes. Consequently, this framework should serve as a starting point. It is quite possible that an entrepreneur will not easily locate public data required by the framework for assessment of a program. In those cases, the entrepreneur will at least be equipped with the types of questions to ask of the accelerator managers to make an informed decision prior to submitting an application. For example, the entrepreneur can at least seek to understand the accelerator program design and inquire regarding the size of the network and the experience of the mentors associated with the accelerator.

5.6 Assessment of research process and quality of results

While this research has highlighted the metrics used by leading researchers to determine the best accelerators, the research was limited to accelerators with a long enough history to have measurable results. It is not possible to use these metrics to evaluate recently formed accelerators. Furthermore, certain metrics are based on the size of the accelerator network. It is possible that this ranking would overlook smaller accelerators with excellent potential results. It is also possible that smaller accelerators will never achieve a competitive position in the rankings simply due to the relatively smaller size of the networks they are building. Entrepreneurs should not exclude smaller accelerator programs from their consideration, rather they should understand that network size is considered highly valuable and thus when joining smaller accelerators, the entrepreneur should consider whether other program attributes are strong enough to overcome any deficiency in network size. For example, smaller accelerators within the Global Accelerator Network (GAN) may foster connections for their participants with other programs across the GAN network, thereby effectively expanding the size of the network for participants.

The data used in this study was taken from secondary sources. The accelerators evaluated by researchers represented only a sample of the existing accelerators. The algorithm used by the Seed Accelerator Rankings Project (SARP) is not public, thus the author considered the general statements from SARP regarding the metrics which they weight more or less heavily in their algorithm. The results section revealed that SARP has been modifying their algorithm over time to include and exclude metrics as the researchers updated their understanding of the most relevant metrics to drive

successful outcomes. This shows the emergent nature of this research (Bradley 1993). While the framework was developed using the most recent model taken from SARP as well as other research published in 2018, it is likely that this model would be changed in the future as researchers gain greater clarity on which accelerator program metrics are most closely correlated with their interpretation of successful outcomes.

Much of the data evaluated in this research was taken from the Seed-DB.com website. The site contained a wealth of information regarding companies that have participated in accelerators and what has become of them (failed, acquired, still active, etc). The site claimed to be “a centralized resource for all information on seed accelerators and the companies that have gone through them.” However, Seed-DB also listed several disclaimers. These should be considered as cautions as they show the reliability of the data is dependent on external sources and estimates. Most notably, Seed-DB cautioned that the data is not complete. Larger accelerator program data was stated to be mostly complete, but many smaller programs failed to give information on a number of participant companies. Data provided on exit values of companies was stated to be “guesses.” Although the data was extracted from published reports when possible, the data was self-reported by the exiting company and could not be vetted for accuracy. Seed-DB did provide a metric to indicate their level of confidence in the reported valuations as low, medium, or high. Seed-DB relied on the data collected by Crunchbase, much of which was entered by the stakeholders of participating companies. Hence, the data was largely self-reported, and some data was explicitly stated to be speculative based on media reports. These circumstances impact the reliability and validity of the data (Silverman 2005). Consequently, the data derived from Crunchbase and Seed-DB should be used as a guide with full understanding and acknowledgement of the limitations of the provided information. (Christiansen 2019.)

This research was motivated by the author’s interest in accelerators from an entrepreneur’s perspective, which follows the advice of Tashakkori and Teddlie (1998) that researchers should “study what interests you and is of value to you” with the aim of bringing about positive consequences. While personal interest motivated the research, the author sought to gather and analyze knowledge from a neutral, unbiased perspective (Saunders, Lewis, & Thornhill 2009). The author relied on the literature to guide the direction of the research and the development of the framework. Locating peer-reviewed literature conducted by neutral university researchers ensured

that the metrics identified for the framework were based on scientific data. In some cases, the data conflicted with widespread opinions. For example, customized programs were widespread and some programs listed customization as an important aspect of their program design (Mucker 2019). Yet the research revealed that standardized program formats led to the best outcomes for participants, while customized programs correlated with neutral or negative outcomes (Cohen, Bingham, & Hallen 2018). Cohen et al. note that their understanding of these phenomena were an emergent theoretical framework, Further investigations on how to locate data and build a framework were guided by the metrics used by the university researchers in the SARP ranking project.

The author's personal experience with the NEXT program was cited to more fully explain the importance of giving entrepreneurs access to information that could be used to evaluate programs prior to admission. The literature cited examples of entrepreneurs who selected accelerators based on factors unrelated to program quality, such as the program start date. The author's experience at NEXT highlighted the need for a framework that could guide entrepreneurs to gather data and make a rational, thoughtful evaluations prior to making the commitment to join an accelerator program.

5.7 Recommendations for future research

The accelerator industry is continuing to grow and develop. Researchers will continue to evaluate program structure, methods, and outcomes. The focus of this thesis was to consider accelerator programs from an entrepreneur's perspective. The framework gives entrepreneurs a starting point from which to evaluate accelerator programs.

Additional studies could help entrepreneurs gain greater clarity on how to prepare to take full advantage of participation in an accelerator. How should participants engage with the alumni network? How can participants discover which mentors are the best fit to help their team thrive? What strategies can entrepreneurs employ to maximize the value of their time in an accelerator? What are the key causes of failure during and after accelerator participation and how can those be mitigated? What can an entrepreneur do to increase his or her chances of admittance to the leading accelerators?

Additional research should also develop methods to evaluate and report on the quality of the hundreds of accelerator programs that are not included in SARP or GAN. Developing an accreditation system for accelerators so that entrepreneurs could enjoy the assurance of an independent third party evaluator could be helpful for entrepreneurs. Also, creating a ranking system for former participants to rate accelerators in a manner that makes the ratings accessible to entrepreneurs could be helpful to give entrepreneurs insights into the programs that generate the most positive feedback from participants.

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