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## **Faculteit Bedrijfseconomische Wetenschappen**

master in de toegepaste economische  
wetenschappen

### ***Masterthesis***

***Creating the entrepreneurs of the future: an empirical study on institutional facilitation  
of student entrepreneurship in Flanders***

**Thibaut Santermans**

Scriptie ingediend tot het behalen van de graad van master in de toegepaste economische wetenschappen

### **PROMOTOR :**

dr. Relinde COLEN



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*This master thesis was written during the COVID-19 crisis in 2020. This global health crisis has had an impact on the (writing) process, the research activities and the research results that are at the basis of this thesis. There was an impact on the data collection. Due to impact of the crisis on universities, it was not possible to complete two of the five interviews that were planned. Additionally, the impact of the crisis on student entrepreneurship and university support was discussed with two of the three interviews that could be completed.*

## **Prologue/introductory remarks:**

In front of you lies the master thesis "Creating the entrepreneurs of the future: an empirical study on institutional facilitation of student entrepreneurship in Flanders". This thesis was written as final piece of my master degree in Applied economic sciences. The completion of this master thesis would not have been possible without the support of certain people. As such, I would like to thank these individuals for supporting me throughout this endeavor.

First and foremost I would like to thank my promotor, prof.dr. Linde Colen. Although my behaviour left much to be desired, she was flexible with my deadlines and provided much needed feedback. I would like to sincerely thank her for her patience, advice and counsel during this journey.

I would also like to thank all counsellors that made time in their busy schedule to take part in the empirical study. Without them this thesis would not have been completed.

Finally I would like to thank my boss Jo Heylen for being so flexible with my working hours, and allowing me to take off time to complete this thesis. Without you this thesis wasn't possible.

Happy reading,  
Thibaut Santermans  
Hasselt, 05 June 2020

## **Summary/synopsis:**

In 2013 the European Commission presented "The Entrepreneurship Action Plan", a blueprint containing commitments by the European Commission and suggestions for member states designed to transform European entrepreneurial culture. A central role in the enactment of this plan is reserved for universities. Universities are expected to equip the future of the workforce with knowledge about and for entrepreneurship by providing entrepreneurial education and training. However, while entrepreneurship education and programs designed to cultivate entrepreneurial skills are effective tools for getting students interested in entrepreneurship, their role in the success of student entrepreneurship is contested. Although students starting a venture during their studies are still the exception rather than the norm, their ventures generate substantial economic and social benefits. As a result, extra-curricular entrepreneurial offerings have become increasingly popular at universities worldwide. These offerings are designed to provide additional support and resources to students attempting to start a venture. As student entrepreneurship is a recent phenomenon, there is no academic consensus on how to facilitate it effectively, and current approaches and offerings of universities vary. Therefore the goal of this thesis is uncovering how universities are facilitating student entrepreneurship and evaluating their methods against the findings in entrepreneurial literature.

This question is answered by means of a preliminary literary study, followed by an empirical study. In the literature study literature is reviewed in order to understand which internal and external factors are conducive to student entrepreneurship, the roles universities play in student entrepreneurship, and how it can best be facilitated. Depending on how far along students are in the venture creation process different factors are important for their success. Students in the early stages of this process benefit the most from activities that build their entrepreneurial knowledge and skills. Additionally, these students should be taught to have confidence in their abilities, not fear failure and take matters into their own hands. For students further along in the venture creation process, social capital is important. This allows them to locate and access resources such as financing and counsel, which are likely needed when a venture is close to starting up.

Universities aid these students by fostering an entrepreneurial ecosystem conducive to student entrepreneurship. This ecosystem isn't tangible, rather it is the term used to describe the combination of social, political, economic and cultural elements within a region that facilitate the creation, development and growth of ventures. An effective ecosystem promotes entrepreneurial culture and provides students with (access to) resources that are otherwise unavailable to them. These resources can be provided by universities themselves through programs and initiatives such as seed funds, incubators and accelerators. However, it is most effective to recruit other actors in the ecosystem such as private businesses or public organisations to provide these resources, especially for smaller universities. Creating an effective ecosystem is not straight forward, and extends beyond the provision of extra-curricular entrepreneurial offerings such as work space and business plan competitions.

Ecosystems develop over time, through the relationships and continuous interaction between various actors in the ecosystem such as entrepreneurs, investors and support providers. As such, universities must engage various stakeholders of student entrepreneurship to participate in the cultivation of the student entrepreneurship ecosystem. An extensive student entrepreneurship ecosystem allows universities to provide a superior continuum of support to students regardless of how far along they are in the venture creation process. Two frameworks are identified as important for the empirical study, the student entrepreneurship ecosystem model (Wright et al., 2017) and the student entrepreneurship encouragement model (Jansen et al., 2015).

During the empirical study the findings in the literature are used to evaluate how universities are creating a context conducive to entrepreneurship. The empirical study is comprised of a short document study to identify university offerings designed to support student entrepreneurs at the four Flemish universities and the VUB, as well as three semi-open interviews that were conducted with entrepreneurial guidance counsellors at UHasselt, UGent and KULeuven. These counsellors serve as an initial point of contact for students trying to launch a new venture, and as such can be considered as their guide through the student entrepreneurship ecosystem. Afterwards these interviews were analysed to identify elements of the student entrepreneurship ecosystem for each university according to the student entrepreneurship ecosystem model, and their role and importance for student entrepreneurship according to the SEEM model.

The empirical study reveals that all universities participating in this study provide a continuum of support for students at every stage of the venture creation process. This includes initiatives designed to foster entrepreneurial knowledge and skills (i.e human capital), and events that allow students to build up networks (i.e social capital). Additionally all universities actively engage other stakeholders in the ecosystem. However, each ecosystem varies in make up and maturity. As a result each university faces different challenges. The biggest challenges for universities is communication. Not all faculty members are open to entrepreneurship, and are unwilling to inform their students about university offerings. This can be a problem as spreading the knowledge about university offerings to students was seen difficult at each university. Finally, ecosystems grow and become more complex. As this happens, universities need to focus on guiding students to information and resources that are relevant for them, as well as coordinate efforts of stakeholders in the ecosystem to ensure the best continuum of support as possible.

There are a few important limitations that influence the ability to generalize the findings of this study. A important potential threat to the generalizability of these findings has to do with the number of interviewees. Due to the corona pandemic, only 3 of the 5 planned interviews could be conducted in time. While expanding the study to 5 universities would improve generalizability and provide valuable insights into more varied approaches, enough evidence was found to conclude that the findings have external validity, are relevant and in fact do reflect how universities facilitate student entrepreneurship. A threat to the internal validity of this study is the construction of the interviews. As the interviews were semi-structured, it is possible that counsellors did not cover all elements they felt were important in the ecosystem. Additionally, a number of questions did not yield useful or relevant answers for the purpose of this study, and as a result were omitted.

There are multiple avenues for future research. An important and under researched aspect of ecosystems is their life-cycle and their evolution over time. Therefore a qualitative longitudinal study interviewing the same counsellors can provide insights into how ecosystems develop, how individual initiatives have evolved and what challenges universities might encounter. Additionally, expanding the empirical study to other universities can be beneficial. As more ecosystems are evaluated and compared, more transferable findings can be identified. Individual initiatives can be examined as well.





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## **1. Introduction**

In 2013 the European Commission presented "The Entrepreneurship Action Plan", a blueprint containing commitments by the European Commission and suggestions for member states designed to transform European entrepreneurial culture. A central role in the enactment of this plan is reserved for universities. Universities are expected to equip the future of the workforce with knowledge about and for entrepreneurship by providing entrepreneurial education and training. However, while entrepreneurship education and programs designed to cultivate entrepreneurial skills are effective tools for getting students interested in entrepreneurship, their role in the success of student entrepreneurship is contested. Although students starting a venture during their studies are still the exception rather than the norm, their ventures generate substantial economic and social benefits (Astebro, Bazzazian, & Braguinsky, 2012).

As a result, extra-curricular entrepreneurial offerings have become increasingly popular at universities worldwide (Matt & Schaeffer, 2018). These offerings are designed to provide additional support and resources to students attempting to start a venture. As student entrepreneurship is a recent phenomenon, there is no academic consensus on how to facilitate it effectively, and current approaches and offerings of universities vary. Therefore the goal of this thesis is : how can universities facilitate student entrepreneurship?

In order to do this, an initial literature study is conducted. This study is meant to identify the internal and external factors that contribute to a student entrepreneur's success. As student entrepreneurship is a recent phenomenon, general entrepreneurship and nascent entrepreneurship literature is consulted to identify possible factors. Following the call of multiple researchers (Autio et al., 2014), the emphasis shall be placed on external factors. These external factors are discussed under the concept of the entrepreneurial ecosystem. The concept of ecosystems has gained popularity in academic literature as a tool to describe, explain and theorize on how economic agents interact with their environment (Acs, Stam, Audretsch & O'Connor, 2017; Butticiè, Colombo & Wright, 2017). (Spigel, 2017, p.1) defines entrepreneurial ecosystems as: "combinations of social, political, economic and cultural elements located in a region that facilitate the development and growth of startups, as well as encourage nascent entrepreneurs and other actors to take the risks of starting, funding and otherwise assisting high-risk ventures".

The findings in the literature are then compared to the approaches of 3 Flemish universities. This is done by means of an preliminary document study, to identify university entrepreneurial offerings meant to support students. Then university entrepreneurial guidance counsellors are interviewed. Entrepreneurial guidance counsellors serve as the initial point of contact for students seeking guidance in their entrepreneurial journey, and as such are important figures in the institutional facilitation of student entrepreneurship. The goal of these interviews is uncovering the relationships between the various university entrepreneurial offerings and student entrepreneurship, as well as how universities are creating a context conducive to student entrepreneurship, i.e a student entrepreneurship ecosystem. Through this, it is uncovered how universities with varying characteristics and strengths can facilitate student entrepreneurship.

## **2. Entrepreneurship: A synthesis of traits and context**

What is entrepreneurship? In 1989 Christensen, Peterson and Madsen defined entrepreneurship as the recognition, evaluation and subsequent pursuit of opportunity in a variety of contexts. Entrepreneurship materializes as observable behaviour such as the creation of a venture or organisation, or a project within an organisation in order to capitalize on an opportunity (Pendergast, 2003). The context refers to all external elements that influence the entrepreneur and their process of recognition, evaluation and pursuit of opportunity. This context is unique to each entrepreneur, and as such the factors that constitute the entrepreneurial context vary. Additionally many contextual factors have been found to vary among nations, regions and time (Wennberg, Pathak & Autio, 2013).

### **2.1. The context**

“All human action occurs in contexts: it is the context that regulates what individuals and teams get to see, what choices they are likely to make, and what the outcomes of those choices are likely to be. For this reason, context must play a central role in our understanding of the origins, forms, micro-processes, functioning, and diverse outcomes of entrepreneurial activities.” (Autio, Kenney, Mustar, Siegel & Wright, 2014, p.1099)

In “The Context of Entrepreneurship”, Patriotta and Siegel (2019) discuss how researchers of the context of entrepreneurship define context differently. For example, some use insights from economics to explain how organizational, institutional and market contexts shape entrepreneurial judgment, which is then viewed as the key determinant of entrepreneurial success (Patriotta & Siegel, 2019). Entrepreneurial judgment refers to the “cognitive faculty that humans deploy to be able to make decisions concerning the future in situations where it is not possible to meaningfully identify and use a clear decision model or rule, such as standards of rational behaviour, but at best crude decision heuristics” (Grandori, 2011; Patriotta & Siegel, 2019, p.1). Entrepreneurial judgement is used by entrepreneurs in the experimental process by which they assess, acquire, combine and deploy resources (Patriotta & Siegel, 2019). As such, entrepreneurial judgment is affected by organizational, institutional and market factors, which in addition to providing these resources also shapes the cognitive lense through which the entrepreneur evaluates them.

Alternatively, the theory of cultural entrepreneurship places entrepreneurial action within a sociological view of institutions. Here context doesn’t create opportunity, and it does more than simply inhibit or facilitate entrepreneurial judgment. Rather, context provides an entrepreneur with the tools they need to gain trust and standing with various stakeholders, which in turn opens up opportunities (Patriotta & Siegel, 2019). Context is enacted through symbolic actions, communication and interaction (Weick, 1979). As such, entrepreneurs gradually create the context as they make a name for themselves, which opens new doors.

“Entrepreneurs are neither passive receptors of cultural norms nor heroic change agents that throw off cultural influences, but rather skilled cultural actors who may navigate their cultural environments to obtain needed and valued resources” (Überbacher, Jacobs & Cornelissen, 2015; Pattiotta & Siegel, 2019 p.1). Here, institutions are paramount in creating the context of entrepreneurship as they provide resources, a ‘cultural stock of stories’ and examples which help new ventures form a clear organizational identity (Pattiotta & Siegel, 2019). In this theory, institutions are mainly cultural toolkits that affect and guide entrepreneurial action when they encounter uncertainty and ambiguity (Swidler, 1986), while organizational and market factors don’t constitute the context.

Entrepreneurship is situational regardless of how one defines the exact components of context, as opportunities are created or provided by the dynamic relationships between the various factors that make up the context (Pendergast, 2003). As these factors interact and influence each other they give rise to configurations of the (business) environment capable of supporting the creation of new, possibly profitable ventures (Pendergast, 2003). These environmental configurations also result in evolving markets, needs or technologies which present opportunities for the potential entrepreneur to capitalize on. Thus the context not only creates opportunity, but affects the ability of the entrepreneur to seize it.

### **2.1.1 The Entrepreneurial ecosystem**

The context that entrepreneurship is situated in is dynamic, extensive and unique to the entrepreneur. In order to capitalize on emerging opportunities the entrepreneur interacts with actors from the context. The concept of ecosystems has gained popularity in academic literature as a tool to describe, explain and theorize on how economic agents interact with their environment (Acs, Stam, Audretsch & O’Connor, 2017; Buttice, Colombo & Wright, 2017). (Spigel, 2017, p.1) defines entrepreneurial ecosystems as: “combinations of social, political, economic and cultural elements located in a region that facilitate the development and growth of startups, as well as encourage nascent entrepreneurs and other actors to take the risks of starting, funding and otherwise assisting high-risk ventures”.

Dubini (1989) first discussed the attributes of ecosystems under the moniker ‘environments’, and states that they are defined by the presence of family businesses and role models, strong business infrastructure, available investment capital, a diverse economy, a supportive entrepreneurial culture and public policies that facilitate business creation. Later a multitude of studies identify the presence of small-scale actors such as skilled workers, lawyers and accountants that specialize in the needs of new businesses in the ecosystem, as well as larger actors such as local firms or universities that act as a lightning rod for talent (Spilling, 1996; Kenney & Patton, 2005). Additionally, entities such as the World Economic Forum (WEF, 2013) advocate that the most vital components of an ecosystem are: the accessibility of local and international markets, available human capital and financing, mentorship and support systems, robust regulatory frameworks and major universities. (Isenberg, 2010) argues for their importance as well.

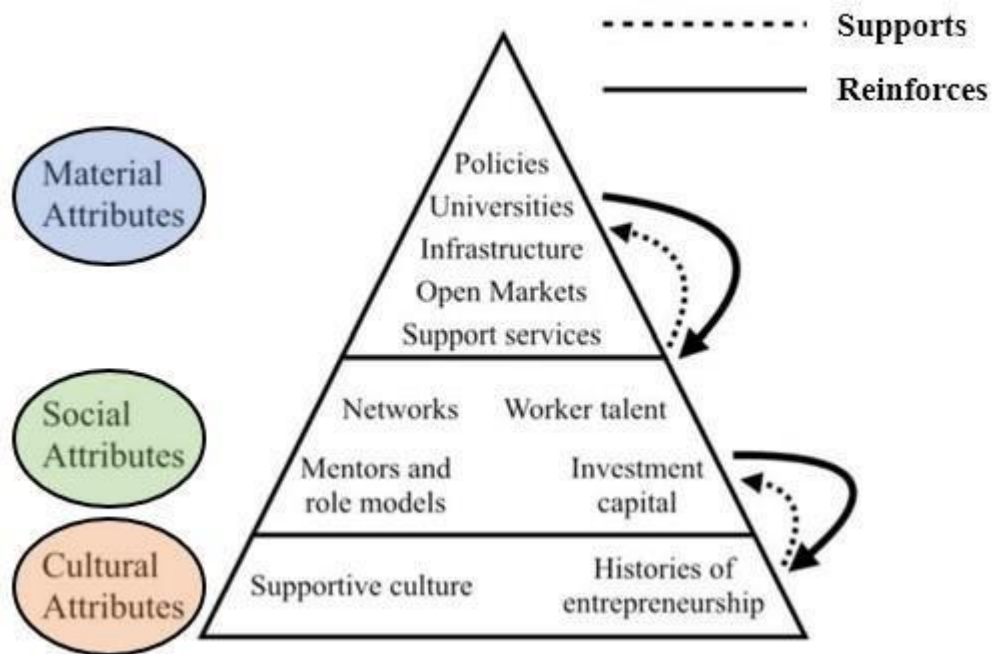


Figure 1: (Source: Spigel, 2015)

Entrepreneurial ecosystems are in essence the contextual factors directly or indirectly conducive to entrepreneurship in a given region. In “The Relational Organization of Entrepreneurial Ecosystems” Spigel (2015) proposes that ecosystems are composed of 10 cultural, social and material attributes. These elements provide advantages, benefits and resources to entrepreneurs, and the relationships between these attributes result in the ecosystem. Furthermore Spigel (2015) suggests that different configurations of these attributes result in ecosystems with different pronounced strengths. Ecosystems can be created and developed in multiple ways, and while some attributes are more important than others, a successful ecosystem (with as outcome high rates of local entrepreneurship) can be created even if some attributes are underdeveloped or nonexistent.



### **2.1.1.1 Cultural attributes of ecosystems**

Cultural attributes are defined by Spigel (2015, p.4) as “the underlying beliefs and outlooks about entrepreneurship within a region”. Spigel (2015) further divides cultural attributes into two separate attributes, namely cultural attitudes and histories of entrepreneurship. Cultural attitudes refer to the way cultural norms and values influence the societal perception of entrepreneurship, and through this an individual's perception. Culture influences the perceived desirability of entrepreneurship, and has been shown to stimulate entrepreneurial intent (e.g., Boyd & Vozikis, 1994; Krueger, Reilly, & Carsrud, 2000, Schlaegel & Koenig, 2014). Histories of entrepreneurship refers to the presence of local success stories and role models that can serve to inspire other potential entrepreneurs (Feld, 2012), and are an important determinant of local cultural attitudes (Feldman, Francis & Bercovitz, 2005). These (stories about) successful entrepreneurs and ventures are key in efforts to promote entrepreneurship as a possible career path.

### **2.1.1.2 Social attributes of ecosystems**

Social attributes represent resources created by or obtained via social networks within a region (Spigel, 2015). The literature on the relevance and impact of social networks on the entrepreneurial process is extensive. Gelard and Saleh (2011) as well as Turulja (2020) find strong social networks (referred to as informal networks) to be a good indicator of future entrepreneurial behaviour in students. Shane and Cable (2002) find that social networks help new businesses unlock access to financing. Additionally, social networks are found to influence perceptions of entrepreneurship and skills (De Carolis & Saporito, 2006), and can act as transmitters for new knowledge about opportunities and technologies (Owen-Smith & Powell, 2004). In order to reap the benefits that social networks might provide, entrepreneurs must have or create relationships with entrepreneurs, potential investors and other economic actors. Additionally one needs to build up enough trust in order to promote the exchange of information and sharing of scarce resources (Davidsson & Honig, 2003; Kwon, Heflin, & Ruef, 2013). According to Spigel (2015), four components constitute the social attributes of entrepreneurial ecosystems: mentors and dealmakers, investment capital, worker talent, and the networks themselves.

Mentors and dealmakers are both important influences on an entrepreneur. Both refer to individuals with entrepreneurial experience and extensive social capital that aid entrepreneurs in the development of entrepreneurial capabilities and their localized social capital. Mentors influence the entrepreneur directly. The presence of a mentor has been shown to increase an entrepreneur's performance (Bosma, Hessels, Schutjens, Praag & Verheul, 2012). In the regional context Lafuente and colleagues (2007) find that their presence increases both overall firm formation and survival rates as well. On the other hand, dealmakers exert influence over the entrepreneur in an indirect manner. Their role can be viewed as a cultivator of relationships, using their own judgement and experience to guide other actors through the ecosystem, helping them identify potential partners, suppliers or other resource providers. Through this, dealmakers facilitate the growth of new connections between other entrepreneurial actors, resulting in higher firm formation rates and regional growth (Feldman & Zoller, 2012).

Investment capital encompasses all types of equity-backed financing that ventures have access to. Ranging from institutional investors like venture capitalists to individuals such as business angels, friends or family, investment capital is an integral part of an entrepreneurial economy (Malecki, 2011). The availability of investment capital is a vital instigator of new venture creation. Additionally investors can adopt an advisory role, providing guidance through the turbulent entrepreneurial process (Spigel, 2015).

The third social attribute of ecosystems is worker talent, i.e. human capital. Working in a startup, whether blue or white collar, requires a different set of skills than in a large organisation due to the ambiguity and lack of structure often associated with new ventures (Pendergast, 2003). Finding individuals suited for the job has been shown to be an integral part of a new venture's competitiveness, and in the modern knowledge economy superior human capital is almost a prerequisite for a new venture's success (Acs, Audretsch & Braunerhjelm 2012; Aldridge & Audretsch, 2011).

The final social attribute that entrepreneurs can use as a resource are the social networks themselves. Networks play a vital role in locating and accessing any of the previous social attributes in a region. They have been shown to aid entrepreneurs in the acquisition of market and technological knowledge (Greve & Salaff, 2003). Dense social networks are valuable due to their ability to provide access to knowledge streams otherwise unobtainable due to trust issues or simply not being exposed to them (Kwon, Heflin, & Ruef, 2013; Coleman, 1988; Granovetter, 1985). Social networks grow denser with subsequent interactions between actors, with face-to-face contact being the most powerful tool for fostering dense social relationships (Schutjens & Völker, 2010). Social networks have also been shown to provide access to investment capital (Greve & Salaff, 2003), and the vast majority of investments in startups is conducted through the social networks of investors (Fritsch & Schilder, 2008). Additionally social networks help entrepreneurs get on the radar of investors, and helps reduce adverse selection through reduced information asymmetry (Shane & Cable, 2002). Finally, social networks are used by entrepreneurs and workers alike in order to find suitable working relations (Van Hove, Van Hooft, & Lievens, 2009).

### **2.1.1.3 Material attributes of an Ecosystem**

Unlike cultural and social attributes, material attributes of an ecosystem represent tangible elements in a region. These attributes constitute the elements often referred to by academic literature as the institutional context (Wright, Siegel & Muster, 2018). They can take form as entities with physical locations such as universities and government departments, or as Spigel (2015) states: “ formalized rules like entrepreneurial policies and well-regulated markets which materialize locally”. Material attributes are further divided into four types: universities, support services and facilities, policy and governance, and open markets.

Contributions by universities to the entrepreneurial ecosystem are threefold. The first resource they provide is new technology capable of creating a business opportunity (Smith et al., 2014). The second are academic entrepreneurs that can bring this technology to market. Otherwise, other entrepreneurs may acquire know-how or technology via knowledge spillovers, by hiring former researchers for example.

The second material attribute of an ecosystem are support services and facilities geared towards assisting new ventures. Examples of these resource providing support services are accountants, IP lawyers and HR specialists who understand the various obstacles start-ups encounter, and provide services tailored to their unique situation (Kenney & Patton, 2005). These support firms and services provide new and small ventures with access to skills and expertise that they require, but do not possess. As most new ventures do not have the resources to acquire these skills and expertise themselves, support firms represent a low-cost solution. Incubators, accelerators and coworking facilities are other examples of actors that provide support services and facilities. They can provide subsidized working spaces for new ventures, provide advice and assist them in network creation (Totterman & Sten, 2005). These actors are viewed by Spigel (2015) as a key stimulator of entrepreneurial activity, and are often an integral element of an ecosystem. However there are some studies that question the current magnitude of their impact on entrepreneurship such as (Tamasy, 2007). Tamasy (2007) suggests technology-oriented businesses incubators are best run by private entities with limited public funding rather than institutions, as politics and systemic inefficiencies might ultimately hinder them in supporting entrepreneurship in an efficient manner.

The third material attribute of an ecosystem are policies and governance. Although they lack a physical location, they are considered material as they “materialize” in government rules and regulations that have a quantifiable impact on entrepreneurial activity (Spigel, 2015). The term policies covers all laws and directives that result in publicly funded support programs designed to incentivise entrepreneurship. These initiatives can provide the entrepreneur with tax benefits, reduce bureaucratic regulation or invest public funds in a manner that is conducive to entrepreneurship (Huggins & Williams, 2011; Mason & Brown, 2013). Policies and governance are essential components of both the economical and political context entrepreneurship takes place in. As such, they are important attributes for regional entrepreneurship.

The presence of strong local markets is very beneficial for the formation of opportunities within entrepreneurial ecosystems. The prevalence of local customers with specialized needs has been shown to birth opportunities for potential businesses (Spilling, 1996). Further entrepreneurs are perfectly situated to identify local opportunities early on due to their proximity to the local market and their ability to easily interact with local potential customers. This can grant them early feedback about potential offerings, lets them set up an early customer base and sharpen their skills before targeting other markets (Feldman, 2001). Although not a prerequisite for an entrepreneurial ecosystem, strong local markets can be the catalyst for the development of an entrepreneurial ecosystem (Spigel, 2015). An example of a strong local market being a catalyst for development of an ecosystem would be the U.S military contractors in California, who were some of the largest early customers of microelectronic ventures, who later helped shape the landscape of current day Silicon Valley (Markusen, 1991).

### **2.1.2. The dynamics of the entrepreneurial ecosystem**

The various attributes in an entrepreneurial ecosystem should not be viewed as independent components that supply resources to the entrepreneur. As previously stated these attributes interact and influence each other in a dynamic fashion, and as a result their development is related (Spigel, 2015; Pendegast, 2003). Linan, urbano, & Guerrero (2011) find that a community's perception of the social desirability of entrepreneurship influences the desire of entrepreneurial actors to think and respond favorably to the entrepreneurial efforts of their peers. The cultural attributes in an ecosystem, i.e cultural attitudes, role models and success stories are thus able to create a context that births supportive social attributes (Spigel, 2015). As the standing of entrepreneurship in a region rises, the formation of dense networks between entrepreneurial actors is facilitated. Without these networks the material attributes like policy and governance would be less effective, as more entrepreneurs would struggle with obtaining the knowledge and information required to make use of these (Spigel, 2015).

Spigel (2015) proposes that different types of attributes in an ecosystem all interact and sustain each other, so their relationships aren't hierarchical where cultural attributes lead to the creation of social ones that amplify material ones. Rather entrepreneurial ecosystems can be configured differently, with differing prominent attributes. Spigel (2015, p.8) redefines entrepreneurial ecosystems as :“ the presence of multiple overlapping sets of attributes and institutions that encourage entrepreneurial activity and provide critical resources that new ventures can draw on as they expand and evolve”. Further Spigel (2015, p.8) suggests that ecosystems containing dense relationships between attributes are maintained and developed through “a supportive entrepreneurial culture; networks of entrepreneurs, workers, and investors; and effective public programs and organizations”. In lesser developed ecosystems one key attribute encourages the creation and growth of other attributes, such as universities creating new technologies and human capital, which in turn create opportunities for entrepreneurs.

## **2.2. The intrinsic qualities of the entrepreneur**

Entrepreneurs are either drawn to opportunity by their potential to improve the entrepreneurs monetary or socio-cultural situation, or pushed to embrace it in order to escape a precarious economic or socio-cultural outcome (Amit & Miller, 1995). In order to grasp opportunity provided by the context and achieve their desired outcome an entrepreneur must be proficient in exploiting opportunity, i.e the process of recognition, evaluation and pursuit. For this researchers have turned to traits, which are used to explain why certain individuals are better suited to tackle the challenges of entrepreneurship. Until two decades ago, entrepreneurship literature focussed the majority of their efforts on the research of these traits while neglecting the influence of context (Autio et al., 2014). This unilateral approach was heavily criticized outside the entrepreneurship research community (Autio et al. ,2014), who are now shifting their focus to context (e.g: Autio et al., 2014; Sigel, 2015; Sigel 2017; Patriotti & Siegel, 2019). Still, the intrinsic qualities can provide useful insights into the possible success of entrepreneurs. The traits most commonly identified as key factors of entrepreneurial action and success are self-efficacy, locus of control, need for achievement, innovativeness, tolerance of ambiguity, risk taking, autonomy and independence (Chatterjee & Das, 2015).

### **2.2.1. Self-efficacy**

In the chaotic environment that is new venture creation certain traits are thought to enable entrepreneurs to thrive. Researchers hypothesize that entrepreneurs possess an innovative mind, allowing them to find and exploit opportunity, and the self-efficacy to forge their own path. Starting your own business is impossible without believing that it will be successful. This hope for a successful outcome is what drives entrepreneurs through the struggles and risks associated with venture creation. Without self-efficacy this hope would be blind, and attempting to start a business foolish.

Self-efficacy is the term used to describe a person's "belief that he/she can perform tasks and fulfill roles, and is directly related to expectations, goals and motivation" (Cassar & Friedman, 2009). In other words self-efficacy describes the confidence an individual has in his or her abilities. Literature makes the differentiation between generalized self-efficacy and domain-specific self-efficacy. In the context of entrepreneurship, the term entrepreneurial self-efficacy (ESE) is often used. High self-efficacy has been shown to correlate with small business growth (Baum & Locke, 2004), work-related performance (Stajkovic & Luthans, 1998), career choice (Lent & Hackett, 1987) and academic performance (Brown,Lent & Larkin, 1989).

In the context of this literary review ESE is the more interesting variant of self-efficacy. It is also the more studied. ESE, although given a clear definition, is still a rather vague term. (Chen, Greene & Crick, 1998) is one of the more cited publications that measures ESE. In their study, ESE is defined as a combination of self-efficacy in five domains : innovation, risk-taking, marketing and financial control. (Chen et al., 1998) compares the ESE of three groups, namely students enrolled in one of three business study programs. Students enrolled in entrepreneurship were found to have higher perceptions of their abilities in the domains of marketing, management and financial control as opposed to their organizational psychology and management counterparts. Additionally (Chen et al., 1998) identified business founders to have higher ESE levels in both innovation and risk-taking than non-founders.

However, there are serious questions to be asked about comparing the ESE of entrepreneurs to other subsets of the population. It is only logical that entrepreneurs have more confidence in their entrepreneurial capabilities than non-entrepreneurs. Additionally, it is likely that entrepreneurial business programs attract some individuals with inherently high levels of ESE, and others build their entrepreneurial self-confidence thanks to the program. Isolating effects is incredibly difficult. As such, much of the new age literature on SE and ESE focuses on the mediating effect of ESE on firm performance instead.

The general consensus among entrepreneurial scholars is that dynamic environments influence firm performance (Cumberland, Meek & Germain, 2015). In "Entrepreneurial self-efficacy and firm performance in challenging environments: Evidence from the franchise context", Cumberland and colleagues surveyed 204 franchisees from Kentucky, U.S. to investigate the relationship between the five dimensions of ESE as proposed by Chen and colleagues (1998) and firm performance. Additionally Cumberland and colleagues included two moderators, namely competitive intensity and technological turbulence. These moderators were added based on the commonly accepted rhetoric that entrepreneurial ventures are more susceptible to failure when operating in challenging environment (McGrath, 1999).

Cumberland and colleagues found all five ESE dimensions to individually contribute to firm performance, adding validity to previous research that focusing on strengthening individual dimensions of ESE is important for both the startup phase of a venture and firm performance in later stages (Cumberland, Meek & Germain, 2015; Barbosa et al., 2007; Drnovšek, Wincent & Cardon 2010; McGee, Peterson, Mueller & Sequiera, 2009). Additionally it was found that in markets characterized by **only** high competition **or** high technological volatility the individual ESE's did not contribute to better firm performance. Two possible explanations are given for this. One is specific to the entrepreneurial subset of franchisees, namely that the franchisor's presence acts as a buffer and source of social capital in moderately challenging market conditions (Cumberland, Meek & Germain, 2015). The other explanation is that "different stages of the business venture may impact whether any specific ESE dimension is more important during competitively intense or technologically volatile times" (Cumberland, Meeks & Germain, 2015 p.15). Further it is found that in markets where both competition and technological turbulence were present, three individual ESE's were important, namely innovation, management and financial control (Cumberland, Meeks & Germain, 2015).

These findings lead Cumberland and colleagues to conclude that ESE has varying importance depending on the stage of the venture, and is especially important in tough markets, which implies that ESE is more important for growth-and-technology-driven entrepreneurs. They suggest that "nascent entrepreneurs who are in the process of starting a business, or even those individuals who have the smallest entrepreneurial intention, many want to consider their scores on all five ESE dimension and pursue opportunities in a less competitive and less technologically volatile industry if their scores are low in finance, innovation and management" (Cumberland, Meek, & Germain, 2015, p.16).

### **2.2.2. Innovativeness**

The relationship between innovativeness and the entrepreneurial personality has been understudied, especially when compared to the amount of research that has been done on other facets of traits and entrepreneurship. The common definition given to innovativeness is how individuals respond to new things (Goldsmith & Foxall, 2003), and like self-efficacy it can be generalized or domain-specific. Because quantifying innovativeness is a tall task, and identifying its determinants is very subjective the little literature on it displays various differing findings.

(Chen et al., 1998) did find business founders to have higher ESE levels in both innovation and risk-taking than non-founders. The link between higher ESE and risk-taking is self-evident. The link between ESE and innovation less so. There is some evidence that point to innovativeness being a mediating factor of SE. (Utsch & Rauch, 2000) found that innovativeness is a mediator of achievement orientation, which in turning was defined as a composite measure of self-efficacy, higher-order need strength, need achievement and internal locus of control. Innovativeness was found to positively and significantly correlate with SE, higher-order need strength, and need achievement but not with internal locus of control.

There are two likely factors that render innovativeness understudied. The first is the issue of measuring innovativeness. Possibly related factors such as risk preferences have standardized sets of surveys questions that result in comparability. On the other hand, literature on innovativeness knows a plethora of different metrics, resulting in the absence of a meaningful framework to measure entrepreneurial innovativeness. The second factor is related to the identification of ESE traits. These are hugely sensitive to both reverse causality and omitted variable bias issues like (Chen et al., 1998). This significantly hinders efforts to study it or interpret results (Bandura, 1997). Research on innovativeness and the entrepreneurial personality is currently stuck in a devilish cycle. It is stuck between the non-existence of measuring tools, leading to difficulty interpreting and comparing findings, which result in fear of limited publication possibilities that dissuade researchers from studying the field and in turn identify the proper measuring tools.

### **2.2.3. Locus of control**

An internal locus of control (LOC) is thought to be an important trait for entrepreneurs. The concept of different loci of control was first introduced by J.B Rotter in 1954 as a way to categorize an individual's belief in "destiny". Those with an external LOC believes that chance, fate or environmental factors are the true determinants of their path. On the other hand, those with an internal LOC believe that they forge their own destiny, and that their decisions control their lives. As a result, individuals with an internal LOC see their individual ability, skills and work ethic as tools to control the outcome of their efforts. Compared to other subsets of the population, entrepreneurs are thought to have a stronger internal LOC. This has been supported by longitudinal studies such as (Levine & Rubenstein, 2016; Evans & Leighton, 1989) and cross-sectional studies such as (Gürol & Atsan, 2006).

LOC has been the focal point of many newer studies. There are studies such as (Barrick & Mount, 2005) that find characteristics such as LOC, need for achievement or risk tolerance better suited to predict entrepreneurial performance than Big-5 traits, which were at the epicenter of early research of entrepreneurial traits. These traits are more easily measured compared to macro traits like the Big-5 which are hard to quantify in the entrepreneurial context as "specific traits rely on explicit description of entrepreneurial activities that may be situated in time, place and role." (Barrick & Mount, 2005, p. 370). Another reason put forth by literature studying the relevance of LOC is that findings can be more easily applied onto decision-making in the professional field (Caliendo, Fossen & Kritikos, 2009).



National culture is an important influence on entrepreneurship, showing the influence of context on personality traits. In 2000 (Mueller & Thomas, 2000) found LOC to be a culturally dependent trait. Their results reveal that LOC varies within different types of cultures. Individuals in countries with individualistic cultures (such as the U.S and most western european countries) exhibit higher LOC than their counterparts in collectivist cultures. In general cultures are becoming less collectivist as time progresses (due to the globalisation of values and the evolving role of religion). Additionally (Mueller & Thomas, 2000) found that both LOC and innovativeness are learned traits. The variance of LOC between cultures was validated by (Tajeddini & Mueller, 2009). Measuring and comparing LOC of Swiss and British entrepreneurs active in the high-tech industry found that those in the british subset have higher LOC. (Tajeddini & Mueller, 2009) suggest that the difference could be impacted by variations in cultural characteristics like individualism, uncertainty avoidance and risk propensity, as defined by famous organizational psychologist Geert Hofstede in 1980 (A. Dellner, 2014).

#### **2.2.4. Need for achievement**

The need for achievement is a trait often associated with entrepreneurship. It reflects the need of an individual to achieve their goals. Some are driven by the need for external recognition of their success, others have an intrinsic desire that feeds their will to attain their dreams. They enjoy the challenge of mastering skills, performing significant feats and find meaning in accomplishment. Research has suggested that high need for achievement characterizes entrepreneurs (Frank, Lueger & Korunka, 2007). Although a lot more uncertain and risky, venture creation allows individuals to put their talents on display in a manner that employment can never do. Similarly to LOC, need for achievement has received a lot of literary attention, which has led to strong support arguing for the importance of need for achievement in entrepreneurship.

Need for achievement was first presented by psychologist Henry Murray in 1938, but only achieved academic popularity after David McClelland refined and popularized the concept (McClelland, Clark & Lowell, 1958). His "acquired-needs theory" suggests that numerous needs influence an individuals behaviour in a workplace context, with need for achievement being one of the most prominent. In entrepreneurial literature many identify a high need for achievement as a predictor of entrepreneurial entry, for example (Frank et al., 2007). There are some studies that challenge this, albeit only in specific contexts, again showing the heterogeneity of entrepreneurship (Frank et al., 2007).

Gürol and Atsan (2006) provide evidence of the increased need for achievement in entrepreneurial students as compared students without entrepreneurial inclination. On the other hand, this wasn't found in the study of Swedish entrepreneurship students by (Hansemark, 2003). In the meta-analysis of studies comparing entrepreneurial and managerial subsets, (Stewart and Roth, 2007) finds that entrepreneurs are driven more by their need for achievement than their managerial counterparts. The country of origin did not affect the difference between the entrepreneurs and the managers.

As previously mentioned, (Mueller & Thomas, 2000) compared British and Swiss entrepreneurs, and found differing levels of need for achievement. They suggest that, just like LOC, need for achievement varies across countries and cultures. Need for achievement is thus also an acquired trait, which leads

to interesting implications for institutions and policy makers. There is research linking need for achievement to both entrepreneurial intentions and better business performance (Collins, Hanges & Locke, 2004; Rauch & Frese, 2007). Studies such as (Frank et al., 2007) argue that the relevance of personality factors such as LOC and need for achievement on venture performance pales in comparison to both contextual influences and organizational structure. However, as they have been shown to be more prevalent in entrepreneurs than in other subsets of the population, and imply entrepreneurial intent, it stands to reason that they play a role becoming an entrepreneur.

### **2.2.5. Independence and autonomy**

Independence requires an individual to take responsibility to perform an act of self-judgement process as opposed to blindly following the opinions of others (Chatterjee & Das, 2015). Being self-reliant and being capable of acting autonomously are seen as important characteristics for entrepreneurs (Rauch & Frese, 2000). Independence and autonomy accelerates entrepreneurial growth, and the desire for independence is shown to develop interest towards entrepreneurship in individuals (Hisrich, 1985). Additionally it has been linked to entrepreneurial success in Chinese entrepreneurs (Ang & Hong, 2000).

### **2.2.6. Optimism**

Optimism reflects an individual's propensity to positively perceiving situations. Multiple studies have found that entrepreneurs make decisions and judgements based on their optimistic outlook (Timmons, 1990; McCarthy, Puffer & Shekshnia, 1993; Cooper, Woo & Dunkelberg, 1988; Ivanova & Gibcus, 2003). Although there is literary consensus on optimism as a characteristic of entrepreneurial tendency, there is little research on the magnitude of influence optimism plays for entrepreneurship, and its actual role in the entrepreneurial decision making process (Chatterjee & Das, 2015).

### **2.2.7. Tolerance of ambiguity**

Ambiguous situations are situations where an individual receives any information that they perceive as complicated, insufficient or conflicting (Norton, 1975). How an individual handles this information refers to their tolerance for ambiguity, which is defined by Budner (1962) as the "ability to perceive ambiguous or doubtful situations as open and neutral or as desirable". Tolerance of ambiguity has been linked to both entrepreneurial intention and success as an entrepreneur (Begley & Boyd, 1987; Shepherd, 2006), and is found to be more common in entrepreneurial subsets than their non entrepreneurial counterparts (Sarachek, 1978; Schere, 1982). In "Testing hypotheses of entrepreneurial characteristics: A study of Hong Kong MBA students", Koh (1996) investigates if entrepreneurial inclination is significantly associated with need for achievement, locus of control, propensity to take risk, tolerance of ambiguity, self-confidence (i.e self-efficacy) and innovativeness by surveying 100 MBA students in Hong Kong. Koh (1996) found that students who were entrepreneurially inclined had greater innovativeness, more tolerance and ambiguity and higher propensity to take risks when compared to those not entrepreneurially inclined. Descriptive statistics also suggested that higher need for achievement, internal locus of control and self-confidence were more frequent in entrepreneurially inclined individuals as well, although this was found to have a not statistically significant impact (Koh, 1996). Tolerance for ambiguity is closely linked to fear of failure, and fear of the unknown is one of the business related fears that entrepreneurs might experience (Deniz, Boz & Gülen, 2011).

### **2.2.8. Risk-taking propensity**

Risk-taking propensity describes an individual's propensity to either undertake or avoid risk (Petrakis, 2005). In entrepreneurial literature specifically it is defined as the inclination to take moderate risks (Begley, 1995), and is thought to be a primary attribute for entrepreneurial success (Rauch & Frese, 2000). Although its importance for entrepreneurial activity has been established, there is research to be done on how levels of risk-taking might differ between entrepreneurs and non entrepreneurs and entrepreneurs from differing industries (Chatterjee & Das, 2015). It is narrowly linked to fear of failure, as fear of failure affects an individual's perception of risk (Gómez-Araujo, Lafuente, Vaillant & Gomez-Nunez, 2015; Vaillant & Lafuente, 2007).

### **2.2.9. Fear of failure**

Entrepreneurial situations that give rise to opportunity are by nature uncertain and are characterized by a lack of structure (Pendergast, 2003). As context is dynamic, it is possible that an opportunity disappears due to changing markets or a competitor taking advantage of it first. This results in uncertainty about potential success, which is one of the primary sources of perceived risk in decision making situations (Sitkin & Pablo, 1992). This uncertainty is further amplified by the absence of structure that is inherent to starting a new venture. As an opportunity is essentially a possibility to serve a unmet societal need or want, there is no blueprint to surefire fulfilment as otherwise someone would have satisfied it already. This absence of structure and information in combination with uncertainty about potential success constitute the risk associated with opportunity (Pendergast, 2003). During the 2005 Innovate Europe Conference, a unique Pan European gathering of venture capitalists, technology innovators, entrepreneurs and CEO's, these aforementioned entrepreneurial stakeholders discussed which issues Europe needed to address in order to commercialize innovation successfully (Tebbutt, 2015). 10 issues were listed, with fear of failure being the first, fear of failure being second and risk-aversion, essentially the antithesis of fear of failure, third (Collins, 2007; Tebutt, 2005). Entrepreneurs must thus be willing to take risks and face the fear of potential failure in order to succeed in entrepreneurial situations.

From a socio-psychological perspective fear of failure is viewed as a sociocultural trait. It reflects the awareness of an individual that their actions might result in a response or change in his social environment (e.g., Gómez-Araujo et al., 2015; Vaillant & Lafuente, 2007). Studies that take this viewpoint hypothesize that social norms that view failure as a shameful experience affect people's approach toward failure (Tezuka, 1997; Hessels, Grilo, Thurik & Van der Zwaan, 2010). Additionally in this literature fear of failure is synonymous to risk aversion. Consequently, fear of failure inhibits individuals, making it less likely for them to engage in behaviour defined by its risk of failure, such as venture creation.

Despite its complex nature, researchers taking an economics-based view of fear of failure (as opposed to a social psychological view or purely psychological view) tend to reduce fear of failure to its most basic definition where fear of failure leads to avoidance. This is in large part due to most studies utilizing the Global Entrepreneurship Monitor (GEM) database. While being one of the premier tools for analyzing entrepreneurship, GEM measures fear of failure through only one item: "fear of failure would prevent me from starting a business" (Bosma, 2013). When fear of failure is viewed solely in the context of venture creation, it has been found that fear of failure perceptions reduce the attractiveness of entrepreneurship as a career path (e.g., Arenius & Minniti, 2005; Kihlstrom & Laffont, 1979). Naturally, reducing these fear of failure perceptions increases the likeliness of venture creation (e.g., Arenius & Minniti, 2005; Langowitz & Minniti, 2007; Minniti & Nardone, 2007). Failure is also still one of the most stigmatized business outcomes (Shepherd & Haynie, 2011). Additionally fear of failure has been found to have a strong influence on firm performance (Collins, 2007).

In "The relationship between Entrepreneur's Level of Perceived Business-Related Fear and Business Performance" Deniz, Boz and Gülen (2011) divide fear of failure into different types of fear : fear of work/social stress, fear of the unknown, fear of not having non-monetary support, fear of uncertainty and fear of legal issues. Deniz and colleagues investigate the relationship between these types of fear and firm performance by surveying 255 turkish entrepreneurs in the city of Istanbul. Their research suggests that only the fear of legal issues impacts firm performance, highlighting the need for further research into possible differences in origin of fear of failure and firm performance. Additionally, these findings support other studies that find fear of failure to be heavily influenced by context, particularly its institutional aspects (GEM, 2009). As it is in part a socio-cultural trait understanding fear of failure can help institutions and policymakers create an environment conducive for entrepreneurship.

### **2.3. Individual characteristics: predictors of conducive context**

Aside from traits, there are other individual characteristics that have been shown to influence entrepreneurial entry. These characteristics are intrinsic factors that cannot be affected by the entrepreneur or the context such as age, gender, ethnicity or their family's entrepreneurial background. These factors undoubtedly influence propensity towards entrepreneurship (Shirokova ,Osiyevskyy & Bogatyreva, 2016). However, unlike traits these factors cannot be taught or acquired, and unlike contextual factors they cannot be influenced to become more conducive for entrepreneurship. Additionally, characteristics themselves do not facilitate successful entrepreneurship. Rather, individuals with characteristics identified as predictors of entrepreneurial entry such as an entrepreneurial family background are more likely to be exposed to a context that educates and provides them with the tools to become an entrepreneur (Parker & Belghitar, 2006). It is possible to alter context to become specifically more conducive for individuals with a perceived lower propensity towards entrepreneurship (such as female or minority entrepreneurs). However, this falls outside the scope of this thesis which investigates how universities facilitate the evolution from nascent student entrepreneur to new-business owner.



### **3. Student entrepreneurship: what, why, and how can universities facilitate it?**

#### **3.1. What is Student Entrepreneurship?**

There are various definitions of student entrepreneurship. Some researchers classify any attempt to launch a new venture undertaken by one or several students as student entrepreneurship (Reynolds, 2005). The largest and likely most influential research project on student entrepreneurship, the GUESSS Project, and its related studies seem to follow this definition. These studies differentiate between non-entrepreneurially inclined students, entrepreneurially inclined students who want to start a business directly after their studies or sometime in the mid-term future (5+ years after graduation), nascent student entrepreneurs and active student entrepreneurs in their Global GUESSS reports (Sieger, Fueglistaller, Zellweger & Braun, 2019).

The GUESSS Project ( Global University Entrepreneurial Spirit Students' Survey) is likely the largest contributor to student entrepreneurship research, and regularly releases reports on the state of student entrepreneurship. As the name states, this survey is given to students at various universities worldwide and is designed to gauge students' inclination towards future, possibly entrepreneurial career choices. Additionally it examines both nascent and active student entrepreneurs, as well as the impact of individual characteristics, university environment, the roles played by family and socio-cultural context on entrepreneurial intent. The most recent GUESSS report contains data from surveys of over 280,000 students enlisted at one of 3,000 universities from 54 countries. (Seiger et al., 2019) reveals that many nascent student entrepreneurs haven't progressed to active entrepreneurship since the previous report. Additionally almost four times as many students intend to start their own business five years after graduation as opposed to starting directly after their studies. This supports the line of thought that many students follow: gain experience before venturing off on their own (Collins et al., 2004). While this has its merits, it is also very likely that more of these individuals end up not pursuing a entrepreneurial career (Holienska, Gal, & Kovacicova, 2017). A main reason for this is the rising opportunity cost of entrepreneurship that accompanies the experience that is gained through employment. Additionally, (Seiger et al., 2019) present recommendations for various stakeholders that would improve the state of student entrepreneurship. For universities and public institutions these recommendations include (Seiger et al., 2019):

- Further improvement and expansion of entrepreneurship education offerings
- Provide an objective view on what it means to become an entrepreneur
- Focus on creating successful entrepreneurs and not just more
- Actively promote entrepreneurial ecosystems
- Attempt to reduce administrative barriers that discourage individuals from becoming an entrepreneur
- Be aware of the gender gap in entrepreneurship, and systematically promote female entrepreneurs in different ways

As stated in the previous chapter, entrepreneurship is strongly context dependent. For many student entrepreneurs, their context is heavily dictated by their university. Every university is situated in a specific spatial context, which might influence how individuals associated with the university perceive opportunities, and how feasible capitalizing on these opportunities is (Sternberg, 2009). For other entrepreneurs deeply connected to the university, such as academic entrepreneurs (faculty or researchers), there is a plethora of evidence that both internal and external university context is important (Casper, 2013; Geissler, Jahn & Haefner, 2010). Internal university context represents factors such as perceived entrepreneurial climate within the university or facilities, while external context primarily refers to the previously mentioned spatial/regional context. However, unlike researching academic entrepreneurship, researching student entrepreneurship is a phenomenon that has just recently started to gain traction in the academic community (Sternberg & Hundt, 2016).

While startups created by students are a lot more prevalent than those created by their academic counterparts, and their economic impact is considered substantial (Astebro, Bazzazian, & Braguinsky, 2012; Backes-Gellner, Demirer & Sternberg, 2002), multiple factors have likely contributed to them historically receiving less academic attention than one would expect. However, the most important reason is without a doubt the evolving role of entrepreneurship and the university in society. Understanding how these roles evolve yields the answers to two important questions: Why is student entrepreneurship important, and why is it underrepresented in entrepreneurship literature?

### **3.2. Why student entrepreneurship has become relevant: the evolving roles of entrepreneurship and universities in society**

Throughout the times, the role that institutions play in society has shifted (Audretsch et al., 2006). In the 1950's when Robert Solow received a Nobel prize for his research identifying physical capital and labor as the drivers of economic growth, institutions were considered as only marginal contributors to economic growth. Fast forward three decades, and changes in society lead to Romer and Lucas expanding on Solows' work and including knowledge and knowledge spillovers as perhaps the most important drivers of economic growth. The shift from a capital and labor driven economy to a knowledge driven one had large consequences for the role institutions played in the economy (Audretsch, Keilbach & Lehman, 2006). Where institutions' contributions to economic growth used to be tangential at best, they were now expected to drive the economy as the main source of knowledge and knowledge transfer.



To better understand their change in role, institutions started to research the different ways that they could use their acquired knowledge to create commercial opportunities and foster economic growth. An important finding related to the new role of institutions is the existence of the knowledge filter. "The knowledge filter is defined as the barrier or gap between the investment in new knowledge and its commercialization. The knowledge filter poses a barrier that impedes or preempts the commercialization of investments in research and knowledge" (Audretsch et al., 2012, p. 317). Commercialization of knowledge is the main driver that leads to innovative activities and when successful, economic growth (Guerrero, Kirby & Urbano, 2006). The discovery of the knowledge filter gave institutions some clarity as to how they could serve their role as both a hub of knowledge and a driver of economic growth. Educating, researching and creating technology would not suffice to create economic growth. Rather universities would need to proactively engage in entrepreneurial activities as to ensure knowledge spillovers that would result in commercialization outside of institutions (Shane, 2004).

Ultimately this led to the creation of the concept of the entrepreneurial university, where institutions are viewed as active players in the pursuit of economic growth (Shane, 2004). While the definition of the entrepreneurial university isn't set in stone, Guerrero and Urbano (2006, p.5) defines it as : "a university that has the ability to innovate, recognize and create opportunities, work in teams, take risks and respond to challenges on its own, seeks to work out a substantial shift in organizational character so as to arrive at a more promising posture for the future. In other words, is a natural incubator that provides support structures for teachers and students to initiate new ventures: intellectual, commercial and conjoint."

As such, universities adapted and have attempted to become this natural incubator, and have in part succeeded. The ultimate goal of the entrepreneurial university model is the creation of ventures to disseminate knowledge which can be commercialized, and maximize the return from intellectual property (Matt & Schaeffer, 2018). Historically entrepreneurial characteristics were thought to be inherent rather than acquired. As such, the vehicle of choice for knowledge propagation became academic entrepreneurship (Hayter, Nelson & O'Connor, 2018). Spin-offs and spin-outs would often involve faculty members with high human capital partnering with established entrepreneurs to bring new technology to market (Vanaelst et al. 2006; van Geenhuizen & Soetanto, 2009). By doing this, these ventures could tap into regional and industrial ecosystems, increasing the chance of venture success (Hayter et al., 2018; Grandi & Grimaldi, 2003). While Guerrero and colleagues' (2006) definition of the entrepreneurial university includes support structures for students to initiate new ventures, this was much less of a focus, both in practice and as a result in academic literature (Matt & Schaeffer, 2018).

One reason for this is due to the involvement level of universities in student entrepreneurship (Matt & Schaeffer, 2018). This level varies from directly involved when the student entrepreneurs venture idea originates from within the university, i.e based on university research, to indirect or non-involvement when the idea originates from outside the university context. In the latter case, universities can play a supporting role by guiding, advising and facilitating the student entrepreneur, or no role at all if the student feels that they have no need for support. As such, some instances of student entrepreneurship are only indirectly linked to their university by virtue of their founders enrollment, and go unnoticed. These entrepreneurs are still influenced by the university context, albeit in a less pervasive manner. As a result, until the creation of the GUESSS project, universities had at best limited information on the scope of student entrepreneurship and its potential value to society. Additionally data collection was a challenge (Sieger, Fueglistaller & Zellweger 2014).

On the other hand, academic entrepreneurial efforts are by definition directly linked to their universities, as most founders are employed by the university and their inspiration for starting a venture almost always originates from within the university. Therefore, as these ideas are based on research done at the university, the university holds ownership of the IP (intellectual property) rights (Matt & Schaeffer, 2018). As a result, data is much more accessible and transparent. In addition to this, the ideas driving these ventures are predominantly innovative and technology driven, and as such tend to have vast economic potential (Sternberg & Hundt, 2016). Therefore the university not only plays a role in the form of context but also as a partner in entrepreneurship, so universities stood to gain much by understanding academic entrepreneurship. However with time the needs of the economy have evolved, resulting in institutions taking on an additional role in the creation of economic growth. Therefore academic attention should shift to understand the requirements of this new role (Matt & Schaeffer, 2018).

As previously stated, the key drivers for economic performance as defined in the Solow economy is physical capital. In the Romer economy the most important driver is knowledge. In our modern entrepreneurial economy, Audretsch and colleagues (2006) identify entrepreneurship as the driving force behind economic growth. (Audretsch et al., 2006) observes: an entrepreneurial society facilitates this entrepreneurially driven economic growth through an institutional context which is conducive to entrepreneurial activity. The role of institutions in the entrepreneurial society is not limited to generating technology transfers via patents, silences and university-sanctioned start-ups. The expanded role of institutions in the entrepreneurial society is to both contribute and provide leadership to create entrepreneurial thinking, actions, institutions and entrepreneurial capital (Acs et al., 2012; Audretsch et al., 2006).

With the rise of the entrepreneurial society the role of universities has shifted. In addition to creating economic growth in a hands-on manner, universities should configure themselves to support the entrepreneurial society (Audretsch et al., 2006), a society where knowledge-based entrepreneurship has become an important driver for economic growth (Audretsch, 2007). As such, in order to support the entrepreneurial society, universities should facilitate knowledge-based entrepreneurship, and they are perfectly positioned to do that. Students are the future of the economy, have high human capital, which is required for knowledge-based entrepreneurship and the majority has entrepreneurial intentions (Seiger et al., 2019). Ambition is not an uncommon trait in students, and many choose to explore different avenues parallel to their academic endeavours (Sieger, Fueglistaller, & Zellweger, 2011). Additionally, there is a strong case to be made that universities are the ideal context for testing ones entrepreneurial capabilities (Houser, 2014).

While students that take this step during their academic career are still the exception rather than the rule, the insights and experiences they gain remain extremely valuable. (Bergmann, Hundt & Sternberg, 2016, p.4) state: "the gathering of entrepreneurial experience can be assumed to facilitate subsequent startup endeavours of students and graduates". As the societal shift continues and the presence of (potential) student entrepreneurs becomes increasingly relevant the need to research and understand how universities can best support them rises. Identifying and fostering entrepreneurial talent early on is paramount, and may help develop student entrepreneurship into a fully fledged engine of innovation.

### **3.3. How can universities facilitate student entrepreneurship?**

#### **3.3.1 Insights from student entrepreneurship literature**

As the relevance of student entrepreneurs is a recent development the literature on student entrepreneurship is relatively scarce. The research on student entrepreneurship that does exist focuses primarily on individual level determinants such as traits taught via entrepreneurship education (Martin, McNally, & Kay, 2013; Pittaway & Cope, 2007), or characteristics such as age, gender, ethnicity and family background (e.g: Shirokova et al, 2016; Sieger, Fueglistaller & Zellweger, 2016; Birkner, Ettl, Welter & Ebbers, 2019) rather than contextual influences. The studies that do investigate contextual influences such as (Alvarez & Lopez, 2019; Bergman, Geissler, Hundt & Grave, 2018) investigate effects of perceived university entrepreneurial climate and entrepreneurship courses on entrepreneurial intent.

As previously mentioned, the majority of entrepreneurial literature pertaining to student entrepreneurship is based on the concept of entrepreneurial intent and how various traits, characteristics and contextual factors influence it, such as a multitude of studies that use the GUESSS dataset. Entrepreneurial intent or intention has evolved to become the most used dependent variable for student entrepreneurship research (Marchand & Sood, 2014), and finds its origin in social psychology literature. Aijzen's (1991) "Theory of Planned Behaviour" (TPB) is the predominant model for intention, theorizes that intentional behaviour is planned ahead of time, and defines intentions as cognitive states of mind at the moment directly before the decision to act. As such, intentions can be seen as a good indicator of behaviour. If an individual has intent it is reasonable to assume that they will act, and in many research domains intent has been found to be the most immediate predictor of actual behaviours (Armitage & Conner, 2001). It is highly unlikely for someone to start a business by accident, so entrepreneurship is intentional (Garcia-Rodriguez, Gil-Soto, Ruiz-Rosa & Sene, 2013). As a result the concept of intentions and planned behaviour was adopted for use in entrepreneurship literature (Kreuger, 2005).

In the TPB framework, intention is determined by three antecedents (Aijzen, 1991). The first is the attitude toward behaviour (ATB), which reflects an individual's views on the action that is intended. A favorable or unfavorable outcome associated with the action will affect one's intention to perform the action. The second is an individual's perception of social pressure to (not) perform the behaviour (henceforth referred to as perceived social norm, social norm or SN). The final antecedent is the individual's perception of how easy or difficult it would be to perform the action (perceived behaviour control, PBC). Applied to entrepreneurship, ATB refers to an individual's personal beliefs and views on becoming an entrepreneur, SN refers to an individual's perception of other people's opinions on the ramifications of becoming an entrepreneur, and PBC reflects how an individual perceives the difficulty of becoming an entrepreneur (Ramos-Rodriguez, Medina-Garrido & Ruiz-Navarro, 2019). Additionally, in entrepreneurship literature PBC is synonymous to perceived feasibility and self-efficacy (Geissler, 2013). Together, ATB, SN and PBC constitute an individual's entrepreneurial intent, with stronger intent being more likely to lead to action. However, there is a very important distinction to be made. Harboring entrepreneurial intent is not the same as actively trying to start a business.

The concept of entrepreneurial intent as a predictor of entrepreneurial behaviour provides valid insights for increasing nascent (student) entrepreneurship, shows us how factors can influence the rate of business creation in the long term or how students view entrepreneurship. Additionally, it can tell us who nascent student entrepreneurs are likely to be. However, research methods based on entrepreneurial intent are less suited to describe the process from nascent (student) entrepreneur to entrepreneur. Ultimately, entrepreneurial intent is a predictor of an outcome (in this case new venture creation), while for the venture creation process it is more important to identify factors that influence the success of the outcome. Even disregarding the disconnect between entrepreneurial intent and success, looking at strong entrepreneurial intent as a determinant of student venture creation is suboptimal. This is in large part due to the intention-action gap, which refers to intention not always leading to action. As the temporal distance of the intended action increases, it is less likely to be taken, as intrinsic and contextual factors might result in intention changing (Shirokova et al., 2016).

As a result, many findings pertaining to student entrepreneurship are useful for instilling entrepreneurial spirit in student bodies, creating nascent entrepreneurs and improving overall entrepreneurial culture. Improving in these areas will create a more favorable entrepreneurial environment in the long term, and thus indirectly facilitate the nascent student entrepreneurs. However, these findings say relatively little about the direct influence of the various factors on students trying to make the jump from nascent student entrepreneur to new business owner. As such the literature on nascent entrepreneurship rather than the student entrepreneurship literature provides insights on the factors that influence the success of the venture creation process.

### **3.3.2. Insights from the nascent entrepreneurship literature**

Much like entrepreneurship literature, early nascent entrepreneurship literature emphasizes the importance of human capital. Opportunity confidence, i.e self-efficacy or perceived behavioural control, is seen as key. One of the earliest papers on nascent entrepreneurship is "The Role of Social and Human Capital Among Nascent Entrepreneurs" by Davidsson and Honig (2003). They divide the venture creation process into two distinct stages, namely discovery and exploitation, based on the differentiation made by Shane and Venkataraman (2000) that entrepreneurship consists of discovering and subsequently exploiting opportunities. The discovery stage is closely linked to who the nascent entrepreneur is, and traits such as self-efficacy are seen as important while the exploitation stage is determined by factors that shape the development and performance of the venture (Shane & Venkataraman, 2000). Using this distinction numerous studies have found that human capital and social capital are important in the discovery stage of the venture creation process (Davidsson & Honig, 2003; Parker & Belghitar, 2006; Hundt & Sternberg, 2016), while the value of human capital diminishes and social capital rises as the venture process reaches maturity.

Much of the literature focussed solely on nascent entrepreneurship are longitudinal studies, primarily using the Panel Study of Entrepreneurial Dynamics (PSED) and its successors as their dataset (e.g Parker & Belghitar, 2006; Dimov, 2010; Reynolds & Curtin, 2007). The iterations of the PSED follow a set of american individuals identified as nascent entrepreneurs throughout their venture creation process, as well as the eventual launch, growth or death of their business. Participants are interviewed six time per year until their business folds. Longitudinal studies are superior for identifying success factors as there is no survivor bias (Parker & Belghitar, 2006). Additionally interviews reduce self perception bias that self administered surveys are privy to. However, as the original PSED only contains american nascent entrepreneurs so one should be careful extrapolating findings to entrepreneurs from other countries, as entrepreneurship is very context dependent, and context is found to vary heavily between countries (Wennberg et al., 2013).

Parker and Belghitar (2006) analyse the PSED and provide some findings that can be useful for nascent student entrepreneurs. Nascent entrepreneurs with post-high-school degrees were more likely to not quit on their nascent venture and significantly more likely to reach venture creation (Parker & Belghitar, 2006). An important finding is that characteristics that influence the likelihood of becoming a (nascent) entrepreneur such as age, ethnicity, gender, general experience, or experience in business ownership do not influence the success of the venture creation process. This finding highlights why it is important to differentiate between factors as antecedents of entrepreneurship and those that facilitate success. What could have been the most important finding is that participating in business assistance programs (created by universities or institutions) did not significantly affect success of venture emergence. However Parker & Belghitar (2006) remark that their study does not take into account the possible long term indirect effects these programs, and more information on nascent entrepreneurs that participated in these was needed to verify this.

Dimov (2010) is one of the more recent studies that focuses on the importance of human capital in the venture emergence process. Using the PSED, Dimov (2010) found that nascent entrepreneurs with more opportunity confidence (i.e self-efficacy) were more likely to advance in the venture creation process. Additionally, experience in the nascent venture's industry was found to be beneficial as well. On the other hand, prior entrepreneurial experience and early planning were found to only indirectly affect the likelihood of venture success by increasing opportunity confidence, validating findings by Parker and Belgithar (2006) (Dimov, 2010). In contrast, earlier literature had suggested that these factors would directly affect the process. Delmar and Shane (2004) had previously found that legitimising activities such as writing a business plan would be beneficial for a ventures development and growth, while (Rotefoss & Kolvereid, 2005) found prior entrepreneurial experience to be related to successfully starting a business.

(Bergmann et al., 2016) and (Tamasy, 2010) are studies on nascent entrepreneurs that investigate context rather than human capital. Tamasy (2010) finds that German nascent entrepreneurs are heavily influenced by their entrepreneurial context, with high quality entrepreneurship policy and a well-developed entrepreneurial culture occupying the most important roles. (Bergmann et al., 2016) is the only study that was found to primarily focus on nascent student entrepreneurs. Their study is based on data from the GUESSS dataset, but does not use the concept of entrepreneurial intent. Although their study only includes business and economics students, these students are most likely to be nascent entrepreneurs (Sieger et al., 2019; Bergmann et al., 2016), where a student is considered a nascent entrepreneur if they've "made an explicit decision to found a company, have a concrete time plan when to do the different steps for founding, or have already started with the realization" (Bergmann et al., 2016). Furthermore, the student must have completed or be in the process of one of the following gestation activities: formulated a business plan, looked for potential partners, purchased equipment, worked on product development, or asked financial institutions for funding (Bergmann et al., 2016).

In line with Parker and Belghitar (2006) they find that entrepreneurial learning through courses did not affect success. However, it was found that duration of study does affect the likelihood of successfully starting a venture (Bergmann et al., 2016). A possible explanation for this is that as students come closer to graduation, they become more aware of entrepreneurship as a viable option after getting their degree. Bergmann and colleagues (2016) also find that nascent student entrepreneurs are more likely to be driven by an idea that originated outside the university i.e. not based on university technology, which was to be expected due to the additional challenges associated with leading a technology-driven venture. Additionally regional prosperity, which has been found to be a determinant for start-up activity for general entrepreneurship, appears to be less important for nascent student entrepreneurs success (Bergmann et al., 2016). However, this does not mean that the regional context is less important for nascent student entrepreneurs, as prosperity is only one component of the context.

Similarly to Davidsson and Honig (2003), Bergman and colleagues (2016) find that human capital is more important in the early "discovery" phase of the venture creation process, and social capital becomes more important as the nascent student entrepreneur attempts to exploit the opportunity. Only building human capital isn't enough to start a business (Davidsson & Honig, 2003). Therefore the best way to facilitate (nascent) student entrepreneurship would be by assisting the (nascent) student entrepreneur in building their social capital. Social capital is built throughout time, and is cultivated through dynamic relationships with various players from the context. Therefore, in order to aid them in this process their context must become conducive to entrepreneurship. As stated earlier in this literary review, student entrepreneurship and thus nascent student entrepreneurship is characterized by the university context.

### **3.4. How can universities facilitate nascent student entrepreneurship?**

Building human capital remains important, due to most students lacking entrepreneurial experience (Sieger et al., 2019). It is likely that they have less developed traits associated with entrepreneurial success such as those mentioned in the previous chapter. These traits enable students to make (better) use of the advantages and opportunities the context can provide in the first place. An ever increasing amount of university resources is awarded towards cultivating skills such as critical thinking and leadership within the student body. Since the start of the new millenium the number of university courses aimed at fostering entrepreneurial competencies has skyrocketed, particularly in western society (European Commission, 2012; Hoppe, 2015; Kuratko, 2005). In addition to these types of courses becoming more common as part of standard curriculums, universities are increasingly providing extra-curricular options such as trainings, workshops, experiential learning and extra credit courses (Wright et al., 2017).

While effects of these educations on entrepreneurial intent are well established (Martin et al., 2013; Pittaway & Cope, 2007), their importance in the venture creation process remains unclear (e.g: Parker & Belghitar, 2006, Sternberg & Hundt, 2016). Regardless of their actual importance, it can be assumed that universities are providing sufficient opportunity for individuals with entrepreneurial intent to cultivate human capital. However, in order to facilitate student entrepreneurship, providing entrepreneurial education and a favorable internal environment are required but not sufficient (Holienska et al., 2017). Spending time and resources on initiatives to increase entrepreneurial inclinations in student bodies will not create more (successful) student entrepreneurs (Holienska et al., 2017).

Therefore focusing on creating a context that aids (nascent) student entrepreneurs in building social capital seems reasonable. Additionally researchers from all disciplines of entrepreneurship literature are discovering that context plays a more important role than was previously thought, and as such many papers call for research on context and entrepreneurial ecosystems (Sieger et al., 2019; Davidsson & Honig, 2003; Bergmann et al., 2016). While both student and academic entrepreneurship are situated in the university context, it is clear that they are affected differently and the findings on contextual influences from academic entrepreneurship literature don't automatically hold for students (Geissler, 2013). Barring few exceptions, academic entrepreneurs are further along in their professional career, and have typically amassed more experience, resources and relationships than students. Therefore it is reasonable to assume that the university context and by extension the regional context where the university is placed in are even more important for a students success, as they often lack these advantages (Geissler, 2013). As such, a logical next step for universities is to create or foster an entrepreneurial ecosystem conducive to student entrepreneurship.



#### **4. The university ecosystem: creating the context for success**

Looking back at the entrepreneurship literature, ecosystems are composed of various elements that can be classified into three categories, cultural attributes, social attributes and material attributes (Spigel, 2017). The cultural attributes of ecosystems develop from the dynamic relationships between actors in the ecosystem over time (Spigel, 2015), and as the university is an actor in this ecosystem it can be beneficial to learn which university actions can contribute to improve cultural attributes of ecosystems. Material attributes were identified by Spigel (2015) as key components of entrepreneurial ecosystems, and are closely linked to institutions and universities, so identifying how universities can provide (access to) material attributes is important. However, building social capital has been identified as the key driver of successful venture creation (Bergmann et al., 2016). Therefore it seems prudent to focus primarily on the relationship between universities and social attributes.

Ecosystems are complex structures and take a while to develop (Spigel, 2015), but universities do not have to start from scratch (Wright et al., 2017). Universities are situated in a regional context, and thus some form of regional entrepreneurial ecosystem. Under the entrepreneurial university model many universities have been important and active players in these systems for a while now (Audretsch et al., 2006). As such, many larger universities have configured their context to be conducive for academic entrepreneurship (Hayter et al., 2018). Matt & Schaeffer (2018)'s "Building Entrepreneurial Ecosystems Conducive to Student Entrepreneurship: New Challenges for Universities" chooses to view student entrepreneurship as an extension of academic entrepreneurship rather than a separate phenomenon.

While student entrepreneurship is definitely different from academic entrepreneurship this approach does make sense when discussing entrepreneurial ecosystems. As university ecosystems are typically already configured for academic entrepreneurship and grow dynamically they can be expanded to include student entrepreneurs and become conducive to student entrepreneurship. In order to do this, the important stakeholders in student entrepreneurship must be identified and integrated. Additionally, a university must decide which actions take precedence and contribute the most to the creation of an effective ecosystem that suits their specific needs, and divide their resources accordingly (Vanaelst et al., 2006). As this occurs the ecosystem expands and becomes more complex (Spigel, 2015). Therefore universities are likely required to become more active in dealmaking and guidance of student entrepreneurs (Spigel, 2017).

The relevance of student entrepreneurship is a recent phenomenon, and influencing ecosystem configuration requires a lot of time and resources (Matt & Schaeffer, 2018), so it is reasonable to assume that many universities are in the early stages of the ecosystem reconfiguration process. A academic entrepreneurship oriented ecosystem is the starting point for most universities in this process, therefore it is important to identify their stakeholders (Matt & Schaeffer, 2018). By doing this we can evaluate their (potential) importance for student entrepreneurship, which provides insights on how to facilitate the reconfiguration process.

#### **4.1 Attributes of academic entrepreneurship ecosystems**

Hayter and colleagues (2018) reviews the literature on academic entrepreneurship and presents eight factors that contribute to academic entrepreneurship: characteristics of academic entrepreneurs, human capital, social networks, entrepreneurial environment, financial resources, scientific, technical, and product characteristics, academic entrepreneurship programs, and university management and policies. While characteristics of academic entrepreneurs, human capital, financial resources and scientific, technical and product characteristics don't fall under any of Sigel's classifications for ecosystem attributes they affect the ecosystem indirectly by being present in entrepreneurs and ventures active in the ecosystem. In this sense, they can be seen as drivers of ecosystem development, for example within ecosystems containing universities with well developed computer science, engineering or life sciences departments. In addition to these factors, Hayter and colleagues (2018) include nine other attributes identified by literature as important for the academic entrepreneurship ecosystem. Hayter and colleagues (2018) further provide a visual representation of the relationships of these factors and attributes in a conceptual ecosystem framework using network images.

"Network conceptualizations- the consideration of the structure that connects a multitude of individual elements- lie at the heart of an ecosystem perspective. In the network images that follow, each node is a subtheme and the size of the node corresponds to the number of articles that include that subthema. Two sub themes are connected with a line if a given article considers both subthemes. Thicker lines indicate a greater number of articles that include a given combination" (Hayter et al., 2018, p. 31).

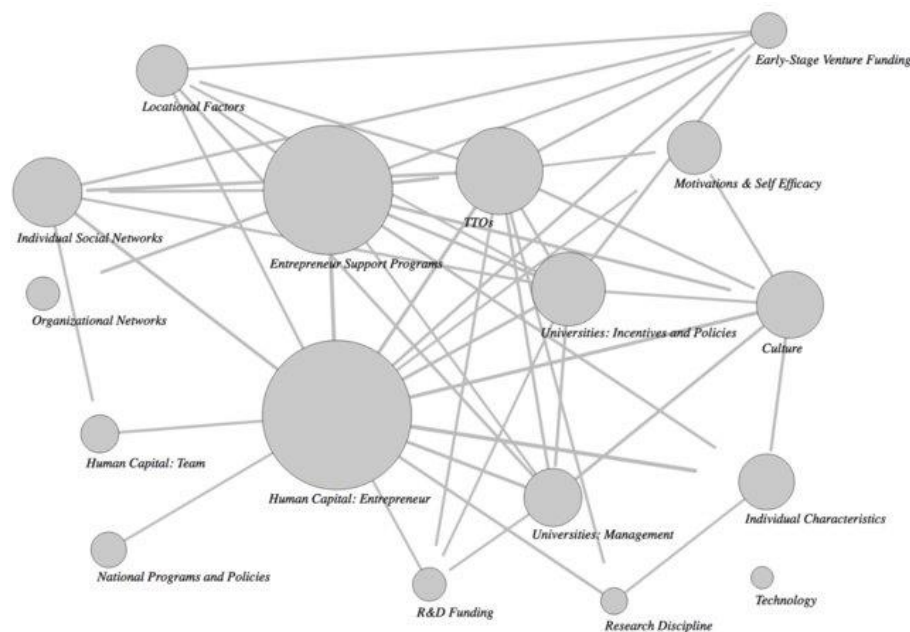


Figure 2:(Source: Hayter et al., 2017)

Their review includes 212 articles, so this conceptualization give us a good indication of the important elements for academic entrepreneurship and their most important relationships (Hayter et al., 2018). Historical bias likely results in an overinvestment in research and overestimation of the role of human capital as opposed to true “context” factors such as social networks. Still, this visualisation style allows us to better grasp the ecosystem (in this case the purely academic entrepreneurship ecosystem), and identify attributes in the ecosystem that universities need to keep in mind during the ecosystem reconfiguration process. As can be seen above, material attributes such as entrepreneurship support programs, technology transfer offices (TTO’s) and university incentives and policies have received the most literary attention in the academic entrepreneurship ecosystem outside of human capital.

#### **4.2 Existing material attributes in the university entrepreneurship ecosystem**

Most universities have at least a few initiatives that can be categorized under university entrepreneurship programs. These programs vary in scope, cost and contributions. Additionally, some programs are likely to be ill-suited for student entrepreneurship, as historically the focus of most universities has been academic entrepreneurship. Academic entrepreneurship literature differentiates between incubators, sciences parks (Wright et al., 2007), university seed funds (Rasmussen & Sorheim, 2006), entrepreneurship education (Pittaway & Cope, 2007), Proof-of-Concept (PoCCs) (Bradley et al., 2013), business plan competitions (Boh, De-Hahn & Strom., 2016) and hackathons (Shah & Pahnke, 2014).

The effectiveness of incubators and science parks on academic entrepreneurship is debated (Van Geenhuizen & Soetanto, 2009), much as it is in classical entrepreneurship literature (Tamasy, 2007). They are expected to play a role primarily by providing physical space to like-minded individuals, and by extension provide access to networks, and possibly mentorship, guidance and resources. However, successful academic spin-offs aren’t likely to have issues with physical space, which reduces the incubators’ usefulness (Van Geenhuizen & Soetanto, 2009). On the other hand, the typical characteristics of student entrepreneurs, such as age and lack of financial capital suggest that this might not be the case for them.

University seed funds are also an important component of the academic entrepreneurship ecosystem. Academic entrepreneurship ventures are technology-driven, and as such are likely to require significant upfront financing that most individuals cannot provide themselves. Finding investors can be difficult as well, as many potential investors such as VC capitalists aren’t willing to invest large sums in early stage ventures (Wright et al., 2006). Therefore, in addition to providing funding these funds send a signal to external stakeholders about the universities commitment to promoting entrepreneurship (Munari, Rasmussen, Toschi & Villani, 2015). For nascent and early stage ventures, receiving seed funding is likely to build up social capital and increase the likelihood of access to other resources within the ecosystem (Hayter et al., 2018). Funding is also likely to be an issue for student entrepreneurs. However, the ventures of student entrepreneurs are less likely to need the degree of funding most academic spin-offs would require.

Entrepreneurship education programs exist as part of degree programs or as extra-curricular offerings and are designed to boost confidence and build entrepreneurial skills in students or faculty (Bergmann et al., 2016). They should fit within the overall commercialisation strategy of a university (Rasmussen & Solheim, 2006), and should materialize as a selection of educational offerings, programs and policies that foster human capital (Hayter et al., 2018). These programs are predominantly designed for students, to awaken entrepreneurial intent in the future workforce and provide the cognitive tools to find and judge opportunity in a new entrepreneurial society (Bergmann et al., 2016). Additionally, research suggests that individuals engaging in entrepreneurship education influence their peers, even those that do not participate in entrepreneurship education, and as a result contribute to a better entrepreneurial climate (Bergmann et al., 2018).

PoCCs are programs designed to bridge the the gap between the conceptualization and materialization of the venture, acting like a womb for recently conceived startups. This support mechanism emulates a mature entrepreneurship ecosystem, and offers a combination of entrepreneurship education, mentoring, networking and technology development services to promising spin-offs (Hayter et al., 2018). This is often combined with some degree of funding (Bradley et al., 2013). Their emergence is a recent occurrence, and as such there isn't enough literature to be sure of their effectiveness, but initial studies such as (Hayter & Link, 2015) do find that universities with PoCCs are likely to create more spinoffs. PoCCs would likely be very useful for student entrepreneurship. However, the cost of such a program requires high return and limits the amount of suitable ventures. PoCCs are still likely to be useful for technology-driven student entrepreneurship.

With the emergence of the entrepreneurial society, some universities have launched business plan competitions to encourage students and faculty to take entrepreneurial action (Boh et al., 2016). Through these competitions individuals with an idea are encouraged to view it in terms of market viability, and come in contact with like-minded individuals. Many award funding and prizes for winners as extra incentives (Swamidass, 2013). Hackathons are another type of program geared towards students rather than faculty. Finding their roots in the software industry, hackathons provide participants with the opportunity to focus on developing software or applications in a short period of time, with the intention of using them as the core for future entrepreneurial activity (Shah & Pahnke, 2014). Recently, hackathons have become popular within other academic disciplines as well, such as business plan hackathons where students are placed in small groups and given limited time to develop a business plan.

TTO's are created by universities in order to increase licensing efficiency, start-up creation and researcher mobility (Matt & Schaeffer, 2018). Hayter and colleagues (2018) conclude that TTO's are integral to the ecosystem, as under the entrepreneurial university model the commercialization of knowledge is mainly achieved through patenting, licensing, start-up creation and university-industry partnerships (Etzkowitz, Webster, Gebhardt & Terra, 2000). They provide players in the ecosystem, predominantly academic entrepreneurs, with management support in the early stage of the venture, financial support, technical expertise and connections to fellow researchers or private partners (Huyghe, Knockaert, Wright & Piva, 2014). However there is an ongoing debate in academic literature about their ability to provide meaningful entrepreneurial assistance beyond initial spin-off establishment (Mosey & Wright, 2007). While TTO's are important for academic entrepreneurship, it is unlikely that they are important for the majority of student entrepreneurship. However, for technology-driven student entrepreneurship they might be able to play a significant role. As such, universities with PoCCs and strong engineering, life science or IT faculty would likely benefit from work closely with their TTO's and make their presence visible to their student bodies.

In general, the individual characteristics of students would suggest that material attributes of ecosystems are more important for (nascent) student entrepreneurship than its academic counterpart (Morris, Shirokova & Tsukanova, 2017). Parker and Belghitar (2006) find that engaging in activities, particularly those that involve money, such as establishing credit with suppliers or receiving money increase the likelihood of venture emergence. This finding could be of some importance for universities and policy makers. Deniz and colleagues (2011) researches the perceived barriers that entrepreneurs encounter that dissuade them from starting their own venture. The biggest perceived barriers are financially related, namely their perceived need to take personal financial risks in order to start a venture and the perceived lack of available equity and debt capital. Other barriers are economic conditions (business environments and economical cycle), individual risk-taking, the lack of courage to take the risk of entrepreneurship, their lack of knowledge of business related matters, and fear of failure.

Many of the other barriers cited such as lack of individual risk-taking and lack of knowledge of business related matters can be reduced by building human capital, and entrepreneurship education is designed to achieve this. However, only alleviating (perceived) financial barriers is likely to significantly affect the success of new venture creation. This can be done in multiple ways. Universities can provide material support, financial support or funding themselves like the various programs discussed above. However, the investment required to provide large scale support for student entrepreneurs poses a significant barrier for most universities. Additionally, it is the universities role to facilitate student entrepreneurship, not become a financier (Jansen, Van de Zande, Brinkkemper, Stam & Varma, 2015). As such, it is advantageous to recruit external actors to provide this (Audretsch, 2015). Engaging regional actors in initiatives is likely to be beneficial for all parties (Spigel, 2017). Additionally universities should make nascent entrepreneurs aware of possible regulatory support and guide them through the regulatory process.

### 4.3. Attributes of the student entrepreneurship ecosystem

Wright, Siegel and Muster (2017) propose a conceptual framework to understand the requirements for an ecosystem that allows students to launch (successful) startups. This framework proposes that such an ecosystem emerges over time through the dynamic relationships and actions of investors and entrepreneurs, which takes place in the synthesis of the university and regional contexts where universities and other stakeholders provide support mechanisms and activities to stimulate student entrepreneurship (Figure 4). The exact elements of ecosystems are fluid and as such different university ecosystems contain different actors, with varying importance (Spigel, 2015). For example, universities with a historical focus on teaching rather than research might not have TTO's, and smaller universities are unlikely to have university seeds funds. However, this framework can still serve as a reference point for evaluating the maturity and expansiveness of a student entrepreneurship ecosystem.

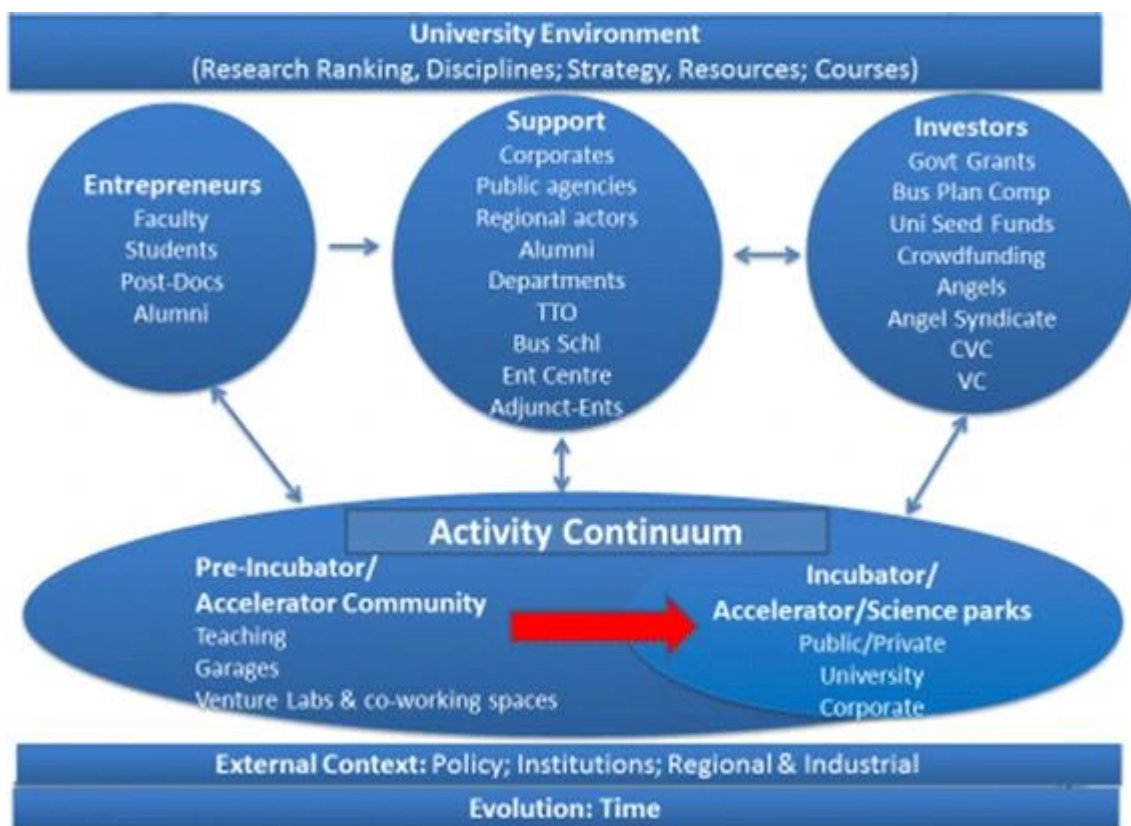


Figure 3: Source: (Wright et al., 2017)

### **4.3.1 The spatial context of student entrepreneurship ecosystems**

An important element of this framework is the variety of university contexts, specifically in terms of scale, scope, research quality, history and culture, location and local networks, resources and capabilities (Wright et al., 2017). Universities differ in size, resources and areas of specialization, and as such they have different goals and objectives. Differences in vision and heterogeneity of context have been shown to influence the nature and extent of academic spin-offs (Vanaelst et al., 2006), so this is likely to be the case for student entrepreneurship as well. The presence of strong and well-established faculties likely plays a role in the types of student entrepreneurship that is facilitated, for example at universities with prestigious science or engineering faculties as opposed to institutions with a focus on humanities or arts (Wright et al., 2017). Aside from affecting the types of student entrepreneurship that are likely to take place, university heterogeneity influences the resources different universities have at their disposal to facilitate student entrepreneurship. This has more implications for smaller universities as they are more likely to be financially restrained from heavily investing in entrepreneurial support actions. Finally, universities have different relationships with other actors in their region. Some universities are deeply imbedded in their region, allowing them to reconfigure their ecosystem efficiently by engaging local actors more easily than universities less ingrained in the region (Wright et al., 2017).

As seen in the most recent GUESSS study (Sieger et al., 2019), the majority of students have entrepreneurial intent. The important questions for these individuals are how, when and where to start their venture. In a study of Swedish graduate entrepreneurs Larson, Wennberg, Wikilund and Wright (2016) find that these individuals' answers to the previous questions are influenced by where the superior opportunities are to be found and by the extent that the graduate entrepreneur is locally embedded. As such, the external university environment, i.e. external context, is likely to play a significant role for student entrepreneurship. This external context consists primarily of the regional context a university might be situated in, so by extension country and possible industrial contexts are a factor as well (Wright et al., 2008).

The external university environment contributes to the university ecosystem predominantly through social attributes, providing different means to acquire customers, suppliers, finance, human capital or other resources (Wright et al., 2017). Additionally Wright and colleagues (2017) believe that material attributes of the external university environment such as: the nature of the local, state regional and national government policy, government objectives concerning the role of universities in society, and the ownership of IP between universities and faculty/students are key in shaping an efficient university ecosystem. This is to be expected, as these material attributes are the manifestation of institutional policies, which can be considered as the "rules and guidelines" players in the ecosystem have to abide by (Autio et al., 2014).

### **4.3.2. The temporal context of student entrepreneurship ecosystems**

Ecosystems require time to develop (Vanaelst et al., 2006), and this temporal context is especially important for early stage ecosystems such as those conducive to student entrepreneurship. Government policies and university's strategic goals change, and the implementation of programs to develop ecosystems doesn't occur without its fair share of challenges. As such, the growth of an ecosystem is unlikely to be linear (Wright et al., 2017). Therefore the development of an ecosystem requires long term planning by multiple stakeholders to streamline the creation or reconfiguration process.

### **4.3.3. Actors and mechanisms conducive to student entrepreneurship**

#### **4.3.3.1. Investors**

It is unlikely for (nascent) student entrepreneurs to possess the financial fortitude to start and grow a venture on their own, although the birth of the internet has reduced entry barriers and startup costs significantly (Wright et al., 2017). Additionally crowdfunding has emerged as a viable financing alternative for entrepreneurs seeking modest amounts of funding (Bruton, Khavul, Siegel & Wright., 2015), which implies its potential for student entrepreneurship. Alternatively, material attributes provided by the university can serve as funding, such as the university seed funds or business plan competitions mentioned above (Hayter et al., 2018). In some countries governments have created grants in order to support the development of student entrepreneurship, for example France (Wright et al., 2017). For the 2016 version of the Price PEPITE-Tremplin for Student Entrepreneurship program, 600 startups created by students or recent graduates under the age of 29 took part. From this pool of candidates, a jury selected 53 laureates who would receive sizeable grants (Wright et al., 2017), which were awarded upon the actual creation of the venture.

However, the majority of startup funding is procured through social relationships with investors (Fritsch & Schilder, 2008). As such, the presence of actors in the ecosystem that can provide financing is required. While VC capitalists play a role for academic entrepreneurship and general entrepreneurship, they are likely minimally important for student startups (Wright et al., 2017). Rather, the presence of actors like business angels and angel syndicates could be important. These provide financing, but many also act as mentors, providing access to business experience, strategic advice and a large social network (Fraser, Bhaumik & Wright, 2015). A strong alumni network can provide the same advantages and as such should also be considered essential to the ecosystem.



#### **4.3.3.2. Support**

Next to investors a successful student entrepreneurship ecosystem requires supporting mechanisms and actors. These actors can be internal to the university or external such as private organisations originating from the regional context. Internal actors include university programs such as the material attributes mentioned above (Hayter et al., 2018), or university philanthropy officers who can attract funding for student entrepreneurship through their relationships with alumni and other contacts (Wright et al., 2017). An important internal actor would be entrepreneurial guidance counsellors, who are an initial point of contact for students with entrepreneurial intent.

They can be seen as an evolution of the career service professional at universities, who instead of connecting students with corporate employers or further education, make them aware of and give access to the student entrepreneurship ecosystem. Many German universities have employed such counsellors (Klandt, 2004) for a while now. Historically faculty bound, they serve as a point of contact for all students wishing to start a venture in the industry related to their faculty (Klandt, 2004; Walter et al., 2013). They have become common at universities around the world as part of the institutionalisation of entrepreneurship (Bergmann et al., 2016), and many aren't associated to one specific faculty.

External support mechanisms are provided by actors such as corporations, foundation and public sector institutions at the national and state/regional levels (Wright et al., 2017). As previously mentioned, these actors can potentially provide financing through business plan competitions or other forms of sponsoring. Additionally, external actors such as corporations might provide mentorship and resources such as free legal counsel (Wright et al., 2017). Some actors such as alumni and adjunct professors blur the line between external and internal context, showing the complexities of the ecosystem concept. They can provide guidance and share experience to student entrepreneurs through initiatives such as in-residence entrepreneurship days, as teachers of entrepreneurship or as coaches for business plan development or entrepreneurial creativity (Wright et al., 2017).

#### **4.3.3.3 Entrepreneurs**

An ecosystem is designed to support entrepreneurs, and as such the entrepreneurs themselves are the most integral piece of the ecosystem. Students, faculty, post-docs and alumni entrepreneurs are part of the ecosystem (Wright et al., 2017), as well as other regional entrepreneurs who can provide resources through interaction. Societies or student organisations likely play an important role in support of student entrepreneurship (Wright et al., 2017). They can serve to create and facilitate relationships within the student body through network events (Kailer, 2009), which surrounds student entrepreneurs with their peers and connects students from different academic backgrounds.

#### **4.3.3.4. Pre-accelerators, accelerators and incubators**

In order to support nascent student entrepreneurs, universities have created a continuum of support activities tailored to the venture creation process (Janssen et al., 2015), supporting conceptual venture ideas in the early stages and facilitating further development primarily through incubators or accelerators (Wright et al., 2017). The main goal of these has been briefly discussed above, but in essence they are meant to assist the nascent student entrepreneur in fleshing out their venture idea and locate potential markets and financing options (Wright et al., 2018; Matt & Schaeffer, 2018; Hayter et al., 2017). They are either publicly or privately owned and run, and there is evidence that the type of ownership affects their success in facilitating entrepreneurship (Tamasy, 2007). Publicly owned incubators are most often part of the university or materialise through government initiatives, while privately owned incubators have close ties to regional businesses (Tamasy, 2007; Wright et al., 2017).

As mentioned above, incubators offer services that may provide access to physical resources and space, office support services, access to capital, process support and networking services (Hayter et al., 2018; Wright et al., 2017). While the resources and space can already be significant for student entrepreneurship, it is possible that their role in student entrepreneurship can become more important, as many incubators have evolved to focus more on providing services such as assisting nascent ventures in evaluating market opportunities, access to knowledge intensive services such as legal counsel and access to entrepreneurial networks (Bruneel, Ratinho, Clarysse & Groen, 2012). Additionally they have become more specialized over time, often focussing on one discipline such as healthtech, becoming better suited to fulfil specific entrepreneurial needs for various industries (Phan, Siegel & Wright, 2005). This likely due to influences from the ecosystem such as the presence of strong faculty and human capital, or a strong regional market.

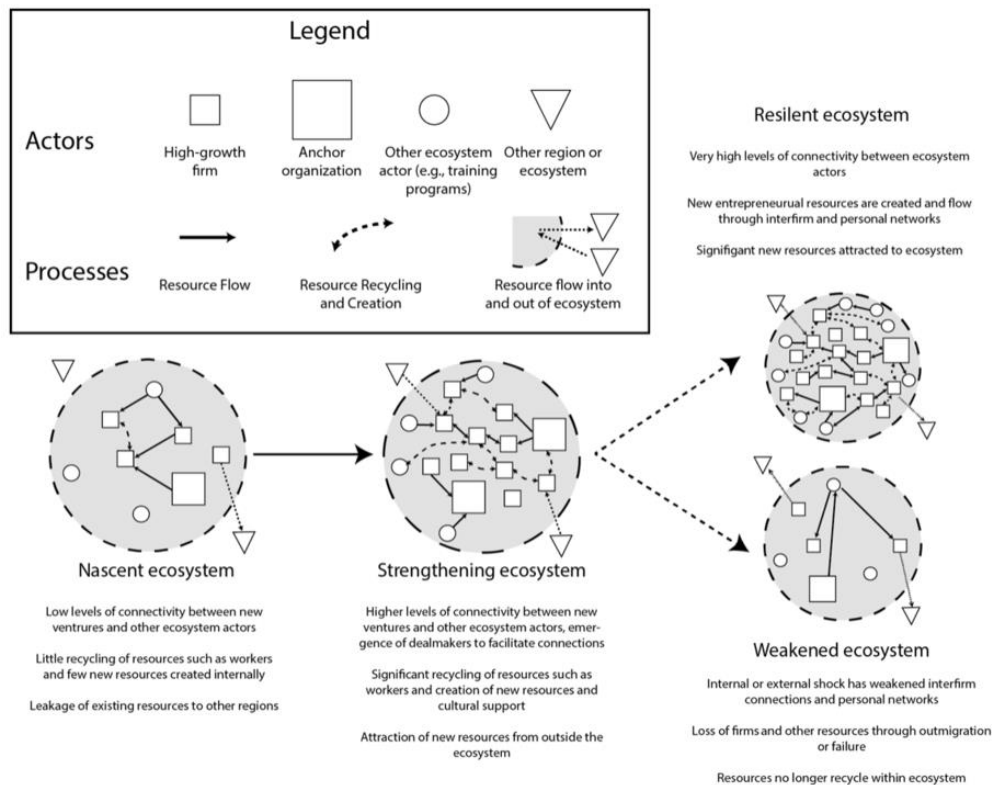
Aside from incubators, some universities or external parties have created accelerators. They are a relatively new phenomenon, that were conceived to improve upon the perceived shortcomings of incubators (Wright et al., 2017). Accelerators are organisations or programs that aim to provide tailored incubation services to accelerate successful venture creation (Pauwels, Clarysse, Wright & Van Hove, 2016). They are typically short and intense programs focussed on education, guidance and mentoring (Pauwels et al., 2016). As the entrepreneurial society emerges, governments, universities and policymakers are exploring different avenues to expose the public to entrepreneurship as early as possible (Audretsch et al., 2006). Very early stage pre-accelerators are programs designed to help potential student entrepreneurs develop embryonic venture ideas, transforming them from individuals with intent to nascent entrepreneurs (Wright et al., 2017). These programs often involve experiential learning or hands-on teaching methods, and can be created by various stakeholders. As Wright and colleagues (2018) point out, the line between these various programs isn't clear. Rather different initiatives are created consisting of various combinations of elements and actors from the ecosystem.

#### **4.4 Challenges and objectives for the development process of entrepreneurial ecosystems**

An important question that is posed in entrepreneurship ecosystem literature is: who plays a role in the configuration of the ecosystem (Spigel, 2017; Audretsch, 2018)? In the case of a student entrepreneurship ecosystem, universities are sure to play a crucial role, but they do not drive it (Wright et al., 2017). Spigel (2017) contends that institutions can only influence configuration to a degree. Multiple stakeholders, each with their respective strategic goals, values and standard, influence the development process (Spigel, 2015; Spigel, 2017; Audretsch et al., 2018). Multiple stakeholders exist inside the university as well. Various faculties might want to become the focal point of the ecosystem (Wright et al., 2017), especially if external financial incentives are concerned. While the capacity of the university to configure the ecosystem is important, it is dependent on the specific context of each individual university and ecosystem. On the other hand, universities that might not have the tools to heavily influence the ecosystem can still facilitate student entrepreneurship.

At its core, the concept of entrepreneurial ecosystems is still just a concept. Entrepreneurial ecosystems aren't tangible, and only exist in the minds of individuals wishing to research and explain the intricacies of entrepreneurship. What creates and shapes ecosystems are the dynamic relationships between the actors (Spigel, 2015; Spigel 2017). These actions create the cohesion between actors, and fortify the "structure" of the ecosystem (figure 5). As such, structural outlines of ecosystems such as the ones above are useful for identifying actors that facilitate entrepreneurship, whose actions and relationships meaningfully shape the ecosystem and provide resources. However, although resources might be present, they mean very little if they are inaccessible (Spigel, 2015; Spigel, 2017). Figure 4 Source:(Spigel, 2017)

Trust is paramount to engage in these relationships and access resources, both inside and outside of the university context (Wright, Sieger & Muster, 2018; Spigel 2017). As such, in order to make full use resources in the ecosystem, entrepreneurs must be able to build up social capital. This is especially true in ecosystems with sparse networks and little trust (Spigel, 2017). In ecosystems with dense networks and high levels of trust, entrepreneurs can obtain access fairly easily which implies that well developed ecosystems require less social capital (Kwon et al., 2013). This dynamic implies the importance of strong networks within the ecosystem regardless of the quality and quantity of resources.



In the context of student entrepreneurship, universities with limited resources or less pronounced faculty strengths might still provide meaningful assistance to (nascent) student entrepreneurs by engaging regional actors, preferably those that provide access to strong regional markets, or by providing guidance on how to build and leverage network relationships (Kailer, 2009). Joint initiatives allow (nascent) student entrepreneurs to build social capital with them, and students should be provided other opportunities to build these relationships (Morris et al., 2017). Additionally, the student entrepreneurship ecosystem is cyclical due to most students only staying in the university context for a handful of years, so it is important to recycle resources and maintain relationships. Investing in a strong alumni network might also be worthwhile as over time they might become an actor with easily accessible dense networks and region resources (Kailer, 2009; Twaalfhofen, 2007).

Universities must also decide on their strategic goals, which should align with their strengths as well as that of their region. For universities that have adopted a variant of the entrepreneurial university model, the development of an ecosystem will be different than for those with limited material attributes in place. Those with established academic entrepreneurship ecosystems need to decide whether to view student entrepreneurship as a separate phenomenon and thus foster separate ecosystems (Hayter et al., 2017). If this is the case, they face questions as to the amount of investment they should make. In either case, universities should find a way to encourage faculty and (nascent) student entrepreneurs to interact and share resources. While some of these attributes such as TTO's might not be useful for many (nascent) student entrepreneurs, those that are helped are those likely to be found at universities that already possess TTO's. Additionally, other material attributes conducive to student entrepreneurship are low cost in comparison to academic entrepreneurship oriented mechanisms (Hayter et al., 2017). Therefore, universities without extensive academic ecosystems in place should seriously consider making student entrepreneurship a priority.

In order for universities to advance their goals and create a suitable and effective ecosystem for student entrepreneurship, there is a need for coordination and open communication between the various actors (Morris et al., 2017). Universities should aim to create a diverse portfolio of extra-curricular activities and events that supplement entrepreneurship education, preferably with external involvement (Kailer, 2009). It is important to keep in mind that these activities should not be viewed in isolation, as their effectiveness is largely tied to how they mesh (Morris et al., 2017), and their ability to collectively provide a continuum of support for students at any point of the entrepreneurship process.

The student entrepreneurship encouragement model (SEEM) proposed by Jansen and colleagues (2015) provides a framework for universities aiming to create or improve their continuum of support (Fig. 5). The SEEM divides the responsibilities of universities for student entrepreneurship into three distinct stages: stimulation, education and incubation (Jansen et al., 2015). The stimulation stage focuses on activities and attributes provided by universities that create entrepreneurial intent in their student bodies. Activities and attributes in the education stage are designed to support students in fleshing out their idea and providing them with the human capital to create a viable business plan. In the final stage, universities "incubate" nascent and early stage ventures, supporting and providing them with resources until they become self-sufficient.

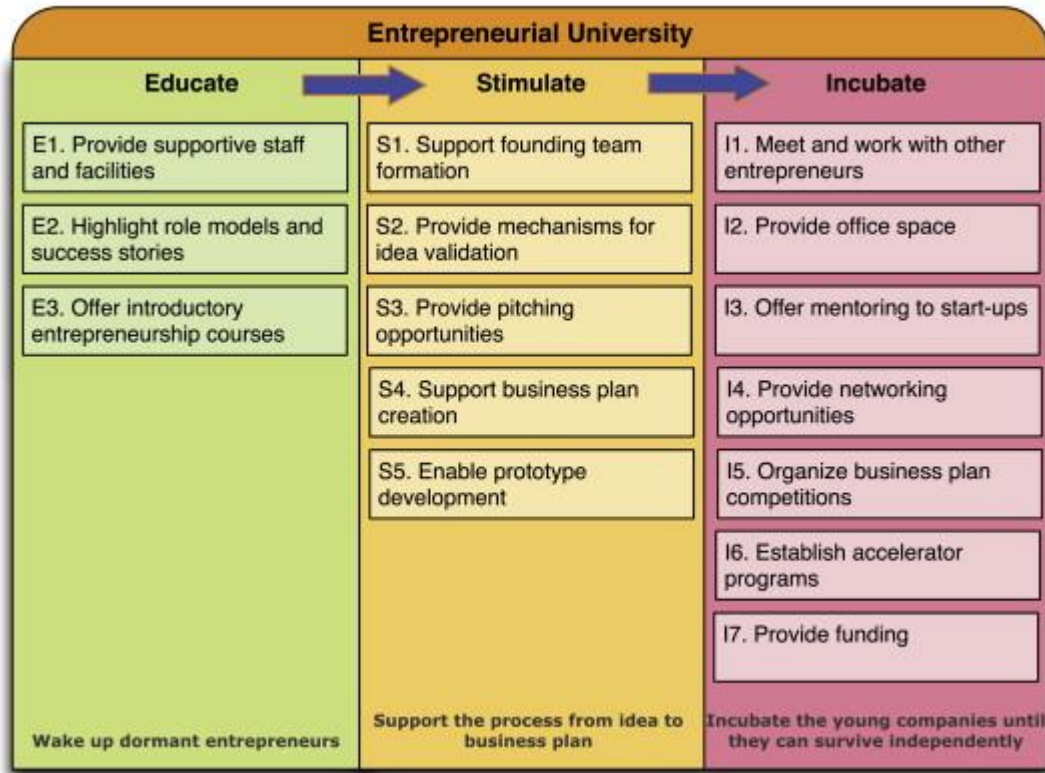


Figure 5: (Source: Jansen et al., 2015)

The most recent GUESSS study indicates that universities are doing a good job at the first two stages of the SEEM, as nascent entrepreneurship and entrepreneurial intent is steadily rising (Sieger et al., 2019). However, the conversion rate of nascent student entrepreneurs to active student entrepreneurs staying near constant justifies taking a closer look at the incubation stage (Sieger et al., 2019). Research on the individual components of this stage has provided mixed insights, with different studies supporting or discrediting the importance of these components on student entrepreneurship (e.g: Tamasy, 2007; Delmar & Shane, 2004) . However, it is incredibly difficult to isolate their individual impact, as they are interdependent (Kailer, 2009). As such, viewing student entrepreneurship support as an ecosystem allows us to examine the relationships between these components. Recruiting regional players to invest time, effort and resources into this incubation stage, and thus expanding the ecosystem might be the most effective way to facilitate student entrepreneurship.

## **5. Empirical Study**

### **5.1. Methodology**

The goal of this thesis is to identify through which means universities facilitate student entrepreneurship, and specifically the transition from nascent student entrepreneur to new business owner. This is investigated through qualitative research, in the form of case studies of entrepreneurial guidance and support at the four Flemish universities (UHasselt, UGent, UAntwerpen and KULeuven) and the VUB. These universities were chosen as they all fall under the Flemish community. Therefore factors such as national culture, policies and support, which have been shown to be very influential for entrepreneurship, are held constant. Additionally, these universities vary in size, scope, resources and specializations, so insights can be gained on how universities in different contexts facilitate student entrepreneurship.

These case studies are comprised of short document studies to identify the various university offerings designed for students, and in-depth semi-structured interviews conducted with entrepreneurial guidance counsellors at these universities. The performed document study only contains information that is available publicly and accessible by individuals looking for guidance. The interview protocol is attached in the appendix. Entrepreneurial guidance counsellors were chosen as interviewees as they are the initial point of contact for (nascent) student entrepreneurs seeking guidance, and can therefore be considered key supporting actors in the student entrepreneurship ecosystem. Additionally, entrepreneurial guidance counsellors have front row seats to the journeys of student entrepreneurs. They are continuously exposed to student entrepreneurship, and over time, through observation and interaction, develop their perception of student entrepreneurship. They see what works and what doesn't, how offerings influence them, and which traits and skills are important for success.

These counsellors were approached in the same manner as (nascent) student entrepreneurs would contact them. Due to the corona pandemic, these interviews were conducted and recorded (with consent) via video chat rather than at the university facilities where (nascent) student entrepreneurs would normally come for guidance. Two interviews could not be completed due to the increased workload of two interviewees during this time period. Additionally, the impact of the corona pandemic on student entrepreneurship and university support was discussed in the completed interviews.

The interviews were then analyzed using thematic analysis and a deductive and semantic approach to identify additional material and social attributes of the student entrepreneurship ecosystem, and their roles in the ecosystem. Additionally, the same approach is used to look for themes identified in the literature such as the provision of a continuum of support, building and fostering a strong and resilient ecosystem. Then the findings are discussed, and conclusions are drawn on how universities are facilitating student entrepreneurship.

## **5.2. Document study**

During this document study information was collected on programs and initiatives offered by the respective universities that are meant to facilitate student entrepreneurship. While not present at UAntwerpen and VUB, the other universities have an initiative that can be classified as a center of (student) entrepreneurship. These centers act as a centralized hub of information on offerings for individuals interested in entrepreneurship. These centers also act as a point of initial contact. At UHasselt and UGent these centers are not part of their universities respective TTO's, while at KULeuven the center. Although UAntwerpen does not have a named initiative, they do employ counsellors to advise and guide (nascent) student entrepreneurs. Additionally, it is likely that the role of center of student entrepreneurship is played by TAKEOFFANTWERP, a large scale joint initiative backed by various student entrepreneurship stakeholders in Antwerp. This was to be investigated in the interview.

### **5.2.1 UHasselt**

Center of student entrepreneurship: StudentStartUP

The center of student entrepreneurship at UHasselt, StudentStartUP, is a coordinated effort by UHasselt and community college PXL.

Employees: 1

Mission: StudentStartUP provides advice and guidance to any student or alumni of the PXL or UHasselt, regardless of where they individual is in the process of venture creation ("StudentStartUP: studeren en ondernemen, dat kan samen", n.d).

Goal: According to the website of UHasselt ("StudentStartUP: studeren en ondernemen, dat kan samen", n.d.), the StudentStartUP offerings are designed to accommodate the following needs and questions of students coming for advice:

- I do not want to start my own business yet, but I want to develop entrepreneurial skills.
  - UHasselt offers three educational courses designed to help students develop entrepreneurial skills: Ondernemerszin (Entrepreneurial spirit), Bouwstenen van OndernemerSCHAP (Building blocks of entrepreneurship) and Business Plan in de praktijk (Businessplan in practice). These are multidisciplinary elective courses.
- I want or am trying to start my own business, and am in need of guidance.
  - UHasselt offers one on one entrepreneurial guidance counselling.



- What can StudentStartUP mean for me? The answer to this last question is summarized as followed:
  - Hosting a variety of activities such as pitch-events, info sessions, and workshops
  - Access to a extended network of experts for free advice
  - Access to a wide network of socio-economic organisations and entrepreneurs
  - Connections to local incubators and accelerators
  - Student entrepreneur status: a intra-university statute designed to alleviate educational burdens of student entrepreneurs.

Additionally, StudentStartUp provides annual reports containing data on how many and which students have sought guidance, their initiatives (including attendance rates), and goals and objectives for the future. In the latest annual report from 2018-2019 StudentStartUp reveals that 86 UHasselt students sought guidance. 9 students already owned a business, 23 started as new business owner, 24 are in the pre-startup phase, 15 are revisiting their idea, 8 are postponing their aspirations and 16 had decided to stop pursuing their venture idea ("Jaarverslag", n.d.).

### **5.2.2. UGent**

Center of student entrepreneurship: DO! (Durf Ondernemen)

Employees: 7

Mission: DO! serves as an initial point of contact for any university student who is considering starting their own venture. Additionally DO! acts as " a springboard towards other entrepreneurial organizations and initiatives in the ecosystem"("About DO!", n.d.).

Goal: According to the website of DO!, its goal is to provide students with an accurate representation of what it means to pursue an entrepreneurial career, to equip as many students as possible with entrepreneurial competences, and provide optimal support for student-entrepreneurs through counsel and guidance during all phases of their ventures. This is done through offerings that consider the three pillars of DO!: inspire, connect and professionalize ("About DO!", n.d.).

- Inspire: DO! attempts to inspire students to think about entrepreneurship through events. These events can be split into two categories, inspirational events for specific faculties and domains such as RETHINK HEALTH and RETHINK SCIENCE, and events for the DO! student entrepreneur community to allow students to inspire each other.
- Connect: "The entrepreneurial ecosystem in Ghent is exploding"("About DO!", n.d.). Therefore DO! focuses on communicating their role in the ecosystem to students and student entrepreneurs, and connecting students with relevant stakeholders both inside and outside of the university context.
- Professionalize: In order to professionalize student entrepreneurship, DO! offers a variety of services, programs and support mechanisms to help students make the jump to new business owner and growth their business. As listed on their website these offerings include:

- The provision of advice and coaching.
- The availability of the student entrepreneur status.
- Elective courses on entrepreneurship: four general courses for individuals with varying levels of knowledge of entrepreneurship, eight faculty specific courses for master students.
- DO! Trainings, short and intense programs on various topics for student entrepreneurs, UGent faculty and external partners. First pilot projects are expected to launch this academic year (2019-2020).
- Expedition DO! A student acceleration track for promising innovative and growth-driven concepts from the DO! student entrepreneurship community.
- Physical space for student entrepreneurs in the form of a meeting room at the DO! facilities.

There were no annual reports of student entrepreneurship available publicly. According to their website, On 20/05/20, 339 students could be considered nascent student entrepreneurs and 133 had started their ventures ("About DO!", n.d.). However, there is no indication if these figures are since the inception of DO! or if they are annual.

### **5.2.3. KU Leuven**

Center of entrepreneurship: KU Leuven KICK

"The one stop shop for students, researchers, professors and alumni of KU leuven with questions related to entrepreneurship" ("About KU Leuven Kick", n.d.). KU Leuven KICK is part of KU Leuven Research & Development (LRD), which is the TTO of KU Leuven .

Employees: 5

Mission: The mission of KU leuven KICK is the promotion, growth and support of entrepreneurship among all employees and students of KU Leuven ("About KU Leuven Kick", n.d.).

Goal: "In this entrepreneurial community, KICK has a coordinating and facilitating role by bringing the right people together, fine-tuning initiatives, sharing tips & tools, offering tailored coaching and helping to launch innovative ideas by engaging its network where necessary". On the KU leuven website of KICK, offerings are categorized under skills and coaching ("About KU Leuven Kick", n.d.).

- Skills: These offerings are various entrepreneurship education programs designed to instill an entrepreneurial mentality or teach specific entrepreneurial skills.
  - Product innovation project (PIP): a multidisciplinary elective course where students are placed into teams and then tasked with designing and creating a solution for a problem provided by a project sponsors.
  - Learning garage: An extra-curricular initiative open to all students, created together with Cronos Leuven (a private business focussed on investing and cultivating software startups). Interdisciplinary teams of students work together to draft a business case based in a predetermined technological domain.

- LCIE entrepreneurship academy: A extra credit course package containing courses on entrepreneurship that is available to all students of KUL.
  - Postgraduate in innovation & entrepreneurship for engineering students.
  - Postgraduate tech innovations in ventures & teams, for (bio)tech teams and (pre)start-ups.
  - Major/minor in entrepreneurship for master students in the applied economic sciences & business economics.
- Coaching: These offerings are tailored towards individuals already attempting to start a business.
    - Advice and coaching by entrepreneurial guidance counsellors
    - Various work spaces to work on entrepreneurial projects.
    - Kick challenge: A business plan competition open to all university faculty and students, with a focus on business concepts that tackle societal challenges.
    - Funding: Students that receive coaching are eligible to apply for a young innovators grant to finance the first steps of venture creation. Applications for the grant are composed in consultation with the supervising coach or counsellor.

No annual reports or quantitative data on student entrepreneurship at the KUL are available publicly.

#### **5.2.4. VUB**

VUB does not have a center of student entrepreneurship, and centralizes all information on their entrepreneurial support on their website under the subpage Entrepreneurship and Start-up. Like the other universities in this empirical study the VUB offers a student entrepreneur statute. This "Reflex-statute" is designed to provide student entrepreneurs with flexibility to combine education and entrepreneurial efforts ("Ondernemen and Start-up", n.d.).

Entrepreneurship education: VUB offers entrepreneurship education in various forms. Aside from elective courses that are available to all students, there are specific elective courses for those in high-growth domains such as biotechnology and software. Additionally the VUB offers:

- A postgraduate innovative entrepreneurship for engineers.
- A master of science in management for students that have a non-economic bachelor or master.
- Starter seminars aimed at masters students, PHD's, researchers and faculty without economic or entrepreneurship knowledge. These are open to those unaffiliated with the VUB as well.
- Advanced starter seminars for aspiring entrepreneurs with prior economic or entrepreneurial knowledge.

Chair of social entrepreneurship: In 2015, Solvay Business School (which is part of VUB) partnered with Close the Gap, BNP Paribas Fortis and Euroclear to create the chair for social entrepreneurship. It's mission is to become a center of excellence for social entrepreneurship, and foster an interdisciplinary network of academia and business that supports social entrepreneurs in the development of entrepreneurial and innovative endeavours that want tackle sustainability issues in society ("Connecting Social Entrepreneurs", n.d.). The chair acts as a support platform where anyone can donate funds to support endorsed projects.

Start.VUB: Start.VUB is the VUB's student entrepreneurship incubator ("Start.VUB", n.d.). At the beginning of each academic year, (nascent) student entrepreneurs and entrepreneurial teams with at least one member enrolled at the VUB can apply to be admitted to Start.VUB. After initial contact, potential candidates pitch to a jury, and 15 (nascent) ventures are selected for the incubator program. In the incubator these students receive:

- Free individualised coaching and mentoring
- Access to a co-working space
- Various workshops around entrepreneurial topics, some are accessible by students not in the incubator program.
- Network events with external stakeholders organized by Start.VUB to allow them to build social capital.

Employees: 4

No annual reports or data on student entrepreneurship was available publicly. Additionally, entrepreneurial guidance counsellors exist in Start.VUB, but not for students not in the incubator program.

### **5.2.5. UAntwerpen**

UAntwerpen does not have a named initiative or department that can be classified as a center for (student) entrepreneurship. As such, there are no stated missions or goals. However, UAntwerpen does centralize their information on the subpage “Discover your entrepreneurial talent” of their website (“Studeren en Ondernemen”, n.d.). Offerings on the subpage are categorized under coaching, entrepreneurship education within the curricula, co-working spaces and testimonials of student entrepreneurs. Based on the contact information available under the subpage, at least three employees work for UAntwerpen to facilitate student entrepreneurship (“Studeren en Ondernemen”, n.d.).

Entrepreneurship education: Exists in multiple forms, such as elective courses for certain educations, a postgraduate for sciences and life sciences graduates or a general innovative entrepreneurship postgraduate for other graduates, or extra-curricular as entrepreneurship experience summer school.

- Coaching: Students can contact different individuals depending on their coaching needs.
  - Coaching consists of a first contact counsellor who can be contacted with questions about entrepreneurship while completing an education, and a entrepreneurial guidance counsellor for specific questions and coaching during the various venture stages. Additionally, coaching is provided by partners, predominantly through TAKEOFFANTWERP, an joint initiative between most stakeholders of student entrepreneurship in Antwerp.
- Co-working spaces: Various workspaces throughout Antwerp, provided by incubators and accelerators associated with TAKEOFFANTWERP.

No annual reports or qualitative data about student entrepreneurship was available publicly.

### **5.3. Preliminary findings**

As expected, each university appears to approach the facilitation of student differently. However, there are some recurring elements present at each university. All universities provide extensive entrepreneurship education which was to be expected based on findings from the literature review. Additionally they all offer a statute designed to relieve academic pressure on student entrepreneurs. Looking back at the SEEM model (Jansen et al., 2015), universities offer or provide access to varying ranges of support mechanisms meant to “incubate” nascent ventures. For example, while UHasselt and UAntwerpen provide work spaces via external partners, larger universities provide these themselves. All universities except for VUB offer entrepreneurial guidance to all their students. It is unclear what roles entrepreneurial counsellors from Start.VUB play for students not in the incubator program. The nature of their relationship and the relationship between the chair of social entrepreneurship and student entrepreneurship were to be investigated in the interview.

The goals and mission statements of the universities with a center for (student) entrepreneurship indicate that viewing the facilitation of student entrepreneurship as a continuum of support provided by an entrepreneurial ecosystem holds merit. DO! views itself as a guide for student entrepreneurs in the ecosystem of Ghent, StudentStartUP state that their networks can be beneficial for students seeking guidance, and KICK views itself as a facilitator and coordinator in its network. UHasselt views student entrepreneurship separately from academic entrepreneurship as StudentStartUP is specifically aimed at students. DO! and KICK are mainly focused on student entrepreneurship, but do offer some services for faculty. For VUB and UAntwerpen it is not possible to say if they take the same approach through this document study. It is possible that TAKEOFFANTWERP and Start.VUB fulfil a similar function, but this was to be investigated in the respective interviews.

#### **5.4. Interview analysis: results and discussion**

The interviews were thematically analyzed, as explained in the methodology. The semi-open questions were designed to let the interviewee talk about themes identified as important for student entrepreneurship in the literature review. Due to the corona pandemic, interviews were limited to UHasselt, UGent and KUL. The following subthemes were uncovered in the interviews: the continuum of support, building human capital, building social capital, actors in the ecosystem: entrepreneurs and financing, support mechanisms and actors, role of university support, and fostering the ecosystem. These subthemes were further combined into 4 themes that can be considered as the most important elements of institutional facilitation of student entrepreneurship. Additionally differences and similarities between universities for each theme are discussed, and suggestions are given to improve student entrepreneurship support.

##### **5.4.1. The continuum of support**

All centers of student entrepreneurship were all established in the last decade. DO! is the oldest and largest center, was founded in 2012 and currently consists of 7 employees, with 5 of them involved with daily business. StudentStartUP was founded in 2015, and consists of 1 employee, while KICK is the most recently established center in 2017 and consists of 5 employees. Aside from the size differences, which were to be expected based on the different characteristics of the universities, they all are integrated in their university context differently. DO! exists as a stand-alone department and isn't bound to any specific faculty. StudentStartUp is technically part of the faculty of business economics, but the interview revealed that they operate independently (E. Huysman, personal communication, 04 may 2020). On the other hand, KICK is a sub department of LRD, the TTO of KULeuven. All centers are looking to expand by adding new courses, and starting new initiatives.

Through the centers of entrepreneur all universities provide a continuum of support as recommended by Jansen and colleagues (2015). In relation to the SEEM model, all provide and coordinate activities that cover the inspire, educate and incubate stages. All centers of entrepreneurship were responsible for integrating entrepreneurship education into curricula. Except for a few KICK programs, all of these courses can be considered as activities Jansen and colleagues (2015) classify as introductory courses in the stimulate stage. Additionally, all centers create activities that serve to educate and incubate. As suggested in the framework for a student entrepreneurship ecosystem provided by Wright and colleagues (2017) universities engage other actors in the ecosystem to provide services, and create initiatives together to cover these activities. The role of the interviewed counsellors can be seen as a facilitator of students that have been inspired but need help refining their idea, and as a guide for students in the ecosystem.

All entrepreneurial guidance counsellors indicated that there is enormous heterogeneity in the students that come for guidance. Students with varying knowledge of entrepreneurship, in various stages of their entrepreneurial endeavours come for guidance. Therefore, counsellors look at two things, the student and their venture idea (M. van den Heuvel, personal communication, 27 May 2020). All counsellors evaluate this in their intake meeting with the student, however there are differences in approach. At DO!, the initial focus is more on the student.

“To be honest, the first session, I always do sessions of an hour, it can easily take half an hour before we talk about the business plan. For me this is important to really create a personal bond with them, and then we proceed” (T. van Damme, personal communication, 04 May 2020). “It is important that I understand at what level of entrepreneurship the person im coaching is” (T. van Damme, personal communication, 04 May 2020). This includes what education they have, and if they have relatives or friends in entrepreneurship (T. van Damme, personal communication, 2020). This is done to get an idea of what knowledge the student needs to be successful (T. van Damme, personal communication, 04 May 2020).

At StudentStartUP students are first asked “what is your idea, what do you want to accomplish with it and what is your ambition?” (E. Huysman, personal communication, 04 May 2020). By starting with the idea, the counsellor can easily determine the level of entrepreneurial knowledge the individual possesses by going into dialogue and inquiring about the business plan, business model canvas and so forth (E. Huysman, personal communication, 04 May 2020). If the individual is far along in their venture idea, the counsellor starts inquiring about the person behind their idea and what resources they might need.

Both counsellors state that they focus on asking critical questions with the intention that the student notices the important elements that they need to work on, and encourage them to take a critical look at their own ideas (E. Huysman, personal communication, 04 May 2020; T. van Damme, personal communication, 04 May 2020). “I’m not going to do it for them... I let them discover it themselves” (T. van Damme, personal communication, 04 May 2020). This is important because many students that first come for guidance have a romanticized view on entrepreneurship, and haven’t considered the practical implications and requirements of their idea. By doing this, counsellors and by extension universities are providing an objective view of what it means to be an entrepreneur, which is one of the recommendations for universities and institutions in the latest GUESSS study (Sieger et al., 2019).



Some students will inevitably be disillusioned about their initial idea after the first meeting, so it is important for the counsellor to keep the student motivated and engaged. "If it's the first contact, the only thing I'm concerned with is how can I motivate them to go on and keep on trying. The last thing I want is for this to be the last time they think about entrepreneurship. This is really what a lot of coaches forget. We have to see at which state someone is" (T. van Damme, personal communication, 04 May 2020). Combining studies with entrepreneurial endeavours is very difficult for many students due to both being very time consuming (M. van den Heuvel, personal communication, 04 May 2020) so unmotivated students are likely to quit following their entrepreneurial aspirations. The various student-entrepreneur statutes can allow students to be more flexible combining the two, but these are only available to students that have officially started a venture.

Counsellors try to keep the student motivated by focusing on positive elements of the initial idea and challenging the student to think about different ways to build on them. (T. van Damme, personal communication, 04 May 2020). "Students are encouraged to plan follow-up meetings at their own pace, so we can give them feedback and help each step of the way towards starting their business"(E. Huysman, personal communication, 04 May 2020). "We often see students that come to an event, become inspired and come visit us. Often they find out over time that their idea isn't achievable, but then we'll see them again after half a year with a new idea."(E. Huysman, personal communication, 2020).

If the student is further along in the venture creation process and is coming for specific advice or has a specific need the counsellors approaches are the same. If the university cannot provide the resources or expertise the student needs, counsellors will search their centers network for a stakeholder that is able to help. " When they need specific advice we often work with referrals to experts in our network, most often for legal advice or patents.." (E. Huysman, personal communication, 04 May 2020). The approach of the counsellors reflects the distinction made by Shane and Venkataraman (2000) between the discovery and exploitation stages of the venture creation process. For the students in the discovery stage, the counsellors play a advisory and in some cases a mentorship role, while for those in the exploitation stage they serve as guide to and dealmaker within the ecosystem. "If we see that we can help students go faster we introduce them to our personal networks, but we can just as easily introduce them into the ecosystem" (T. van Damme, personal communication, 04 May 2020).

#### **5.4.2. Building human capital**

Most of the students that come for guidance are identified as being in the discovery phase. As such, building human capital is most effective to help these students along the venture creation process (Bergmann et al., 2016; Davidsson & Honig, 2003). As identified in the preliminary document study, all universities offer a wide array of entrepreneurship education and extra-curricular entrepreneurial offerings designed to build entrepreneurial knowledge, or give them an idea of what life as an entrepreneur is like (E. Huysman, personal communication, 04 May 2020). However, KICK also offers an initiative designed to teach participants entrepreneurial soft skills and expose them to situations similar to those encountered during venture creation (M. van den Heuvel, personal communication, 27 May 2020).

KICK's Product innovation project (PIP), is a multidisciplinary course where students are put in groups of 9 and given a problem to think about by a project sponsor (M. van Heuvel, personal communication, 27 May 2020). The project sponsor can be anyone, from private business to the government. The teams are given a year to think of a solution to the problem, and build a prototype of the solution. "It's really the best tool that we have I think, the students love it, they are always really excited about doing this and we receive a lot of positive feedback at the end, what we aim to teach is to get your hand dirty, get out of a theoretical and academic mindset and start putting those skills to work on the one hand, and on the other hand to realize what your own worth is in a bigger interdisciplinary team, and also what the worth of others is in a team, what their input can be and give them a taste of other disciplines." (M. van Heuvel, personal communication, 27 May 2020). The PIP project covers all activities suggested in the Educate phase of the SEEM model (Jansen et al., 2015), but also fosters multiple important traits for entrepreneurial success.

During the interviews the counsellors were asked the question: In your opinion, which traits are most important for a student entrepreneurs success? All counsellors answered that taking initiative and being hands-on was incredibly important. Looking back at the literary review, this can be seen as the trait locus of control. Individuals with a high locus of control believe that their actions are what changes their situation, and is one of the only traits identified in both older and newer entrepreneurship literature (Chatterjee & Das, 2015). "Being somebody that takes action and taking initiative is hugely important. I think we see that most of the times where an idea fails to become a startup is where people create a theoretical idea but fail to make the step to take action and put in the work" (M. van den Heuvel, personal communication, 27 May 2020). "There are alot of students that have strong ideas, but struggle putting them into action. These people really benefit from finding partners that can help and push them to finish the idea" (E. Huysman, personal communication, 04 May 2020).

Even if taking action results in failure, it is likely to be an important experience for students. "Mostly I tell them the first time we see each other, a fast failure is really something to aim for... either fail or succeed fast. I always try to convince them, while you are studying, you don't have anything to lose, there is no failure possible. There are only enriching experiences. It's a given that first entrepreneurial experiences lead to better second" (T. van Damme, personal communication, 04 May 2020). This is a good mindset to teach students, as universities are considered the ideal context for individuals to attempt to start a business (Houser, 2014), and an individual's opportunity cost is likely to be the lowest (Holienska et al., 2017).

Aside from LOC, self-efficacy was seen as important by the counsellors. "I think that a huge part of our task is giving students the confidence to take action for those that don't have it already, so that they can see that they can do this as well, and that they can be an entrepreneur" (M. van den Heuvel, personal communication, 27 May 2020). This confidence ties in with the motivation of a student to continue the venture creation process (T. van Damme, personal communication, 04 May 2020). Therefore helping students build confidence in their abilities is an important part of the universities role in facilitating student entrepreneurship. Additionally, learning to work in entrepreneurial teams is a crucial skill for students trying to start a venture, as ¾ student ventures that are created are comprised of more than one student (Sieger et al., 2019). As such, initiatives such as PIP can be considered a very effective tool for universities, as their core aim is fostering LOC and self-efficacy.

#### **5.4.3. Incubate to exploit**

For students in the exploitation stage of the venture creation process, incubation activities are the most beneficial. Additionally, social capital is seen as essential to complete the process (Bergmann et al., 2016), as it unlocks access to resources in an ecosystem. Therefore, exposing students to actors in the ecosystem can be considered very important, and this is mentioned by all counsellors. This is especially important for students who aren't already surrounded by a good network (T. van Damme, personal communication, 04 May 2020). Each university has integrated external actors from the ecosystem into initiatives, which was recommended by Kailer (2009). For example, all centers of entrepreneurship run a business plan competition, where judges are known local entrepreneurs or company executives. DO! arranges for partners to advise and mentor students every month in their "experts in the house" sessions (T. van Damme, personal communication, 04 May 2020), and StudentStartUP has various private partners that students can contact for free counsel (E. Huysman, personal communication, 04 May 2020).

None of the universities where an interview was conducted had an incubator. Instead the centers have close ties with local incubators, and work with referrals by the counsellors. Only DO! has an initiative with elements of an accelerator. Although DO! does not consider itself a true accelerator, they do offer a pre-acceleration track. Expedition DO! is an initiative that combines elements of a business plan competition with an accelerator (T. van Damme, personal communication, 04 May 2020). "First individuals or teams are selected for their idea and then undergo a 7 month long program, with the purpose of them starting up their business after these 7 months. ... these ventures go through different phases very quickly. We are surrounding them with experts and coaches and the results are very good for this program" (T. van Damme, personal communication, 04 May 2020).

#### **5.4.4. Fostering an ecosystem conducive to student entrepreneurship**

As student entrepreneurship keeps growing (Sieger et al., 2019), universities will need to do three things to help students in the venture creation process. First they must set their goals for student entrepreneurship, and identify their role in the ecosystem (Matt & Schaeffer, 2018). Second, they should interact and engage with stakeholders in the ecosystem, and strengthen the bonds with important actors. By doing this, the ecosystem becomes stronger and more resilient (Spigel, 2017). Third, as the ecosystem expands and becomes more complex, they should evaluate the role they play for students (Matt & Schaeffer, 2018). By doing this, universities can promote the growth of the ecosystem as suggested by Sieger and colleagues (2019).

Based on the document study and the interviews it can be said that the role of each center of entrepreneurship in their ecosystem is different. This is reflected accordingly by their goals and mission statements. DO! views its role as a lynchpin in the regional ecosystem of Ghent. While their main focus is student entrepreneurship, DO! does provide services and support to faculty, and aims to incorporate (student) entrepreneurs into the regional ecosystem. The regional ecosystem is expansive, with many actors and dense networks. "We are really well-known in the ecosystem, and as a result our referral carries a lot of weight for other organisations" (T. van Damme, personal communication, 04 May 2020).

Additionally, DO! can be said to be fostering a sub ecosystem for student entrepreneurship, the DO! community. The primary purpose of this sub ecosystem is to motivate students to continue pursuing entrepreneurship. "I think networks are always important, at least in my experience. When you are starting your venture, at each moment in your timeline you need your network, informal or formal. To really get a push to start, these networks are important. For students being surrounded by other student entrepreneurs is important, that is why we really focus on creating a community and allowing students to build these networks, both formal and informal. They push each other forward, we really notice this, for example with expedition DO" (T. van Damme, personal communication, 04 May 2020).

On the other hand, StudentStartUp is not likely to play a significant role in the greater regional ecosystem for other players. During the interview, the counsellor focussed primarily on the role StudentStartUp plays in creating a student community. StudentStartUP was specifically created for students, and its primary goal is the creation of a student entrepreneurship ecosystem. "Initiatives such as StudentStartUp need to grow from the bottom, we can't force anyone, not the students, not the professors... we see that our events really help, we attract like-minded young people " (E. Huysman, personal communication, 04 May 2020).

Although UGent and KULeuven are both large universities, the role of KICK differs from DO!. KICK is integrated into LRD, which serves to improve communication between academic and student entrepreneurship. Like Matt & Schaeffer (2018), KU Leuven seems to view student entrepreneurship as an extension of academic entrepreneurship. As such, rather than creating a separate student entrepreneurship ecosystem KICK is responsible for providing material and social attributes to students in a larger university ecosystem. During the interview, the counsellor emphasized the role KICK plays in coordinating its own initiatives rather than the importance of working with other actors. The relationships with other actors were mentioned when enquired about, but were not elaborated on in great detail. While these are undoubtedly important, this would suggest that KICK and by extension KU Leuven are less reliant on the regional ecosystem for facilitating student entrepreneurship.

In order to strengthen their ecosystems, universities need to continuously interact and engage with stakeholders. These stakeholders can be part of the university or external. Getting professors and faculty on board with entrepreneurship is crucial for the ecosystem, especially at the larger universities. "We have many deans and professors who support us, also give us the opportunity of going in their classes and using their forums to spread our word. On the other hand there are plenty of professors that aren't into the entrepreneurial setting. That is also the reason we have a communications director, because we found out that there is a direct link between the fact that they know you exist and their willingness of letting them into their courses. Because when I go into the courses, to share my story, which doesn't take more than 15-20 minutes, we always see a spike in new entries and guidance at DO!. A lot of students that come to us tell us they didn't know we existed before see me in their class. But we know this, and we work on it." (T. van Damme, personal communication, 04 May 2020).

At KICK, communicating about entrepreneurship support with the student body is seen as a key obstacle as well, and faculty are seen as a key player in remedying this. "One thing is that students really have to search for it. We have to go looking for the students for the PIP, some professors are very helpful in communicating about us, but many are not, but I think this would be our main working point, spreading the word more and that the people that find out about us that they can actually do something with it." (M. van den Heuvel, personal communication, 27 May 2020).

" We see professors for example, but also the communication employees, as our ambassadors inside the KUL. As I told you we are not part of any faculty, which has a plus as we can be very flexible and quick to work but we really need the support of the faculty to get the word to the students, so we try to find professors in every faculty that are enthusiastic about entrepreneurship to help us, and we've managed to find some in every faculty so that's nice, we keep in close contact and keeping them up to date about us, so that if they notice any student with something entrepreneurial, so that they know how to guide them to us as well." (M. van den Heuvel, personal communication, 27 May 2020).

Universities are also engaging other internal stakeholders, such as alumni and student organisations. KICK has a large launching event at the start of the academic year meant for faculty and students, and organize a yearly event with the student unions. In turn, these invite alumni and faculty to widen the exposure of KICK (M. van Heuvel, personal communication, 27 May 2020). StudentStartUP organizes entrepreneurs in action, an informal initiative where students that have regular contact with StudentStartUp are gathered. This initiative exists as a closed group on social media, but also meet offline. Both of these initiatives have gained in popularity and attendance. Keeping a close relationship with students and alumni was a focal point of the centers of entrepreneurship according to the counsellors. By doing this, the ecosystem stays populated, which is important for cyclical ecosystems (Spigel, 2017). " The student body is a very difficult to reach audience, especially because they change every 4-5 years, so it's a continuous effort to keep this up, but through the years we've managed to keep growing" (M. van den Heuvel, personal communication, 27 May 2020).

All centers of entrepreneurship have joint initiatives with their local governments, other local institutions and VLAIO, the Flemish agency for innovation and entrepreneurship. Gentrepreneur, Pitch Please and LEON were all considered as important supporting actors by the counsellors. These joint initiatives allows stakeholders to pool information and resources together, so they are more easily accessible (M. van den Heuvel, personal communication, 2020). Additionally, these initiatives are used to maintain relationships with the public players, and allows actors in the ecosystem coordinate their efforts (T. van Damme, personal communication, 04 May 2020). This is needed as differing agendas is seen as a main inhibitor of ecosystem growth and efficiency (Morris et al., 2017; Wright et al., 2017). Additionally, these initiatives encourage the formation of a strong ecosystem by allowing regional resources to be recycled (Spigel, 2017).

Finally, universities must evaluate the role their centers of entrepreneurship play for student entrepreneurship based on their goals, their role in the ecosystem and their relationships with other actors. As their ecosystems grow and become more complex, students will need more guidance through the system, and coordination efforts need to be increased (Spigel, 2017). It was stated by all counsellors that guiding students towards the proper support and information is crucial. "I feel this is a big one. I feel that many students that come to me for coaching cannot deal with the amount of information or lack thereof that is available to them online from many different agencies and stakeholders and organisations, that are or are not from the government. They have trouble identifying what information can help them, and which businesses might just be trying to make money off of them. There are so many different players that it isn't clear where they need to be. We help them navigate it, provide them links, tell them which subsidies they could go for, things like that" (M. van den Heuvel, personal communication, 27 May 2020). "It's very complicated and its very hard to find the right channels for support. Also, there are a lot of things that are unclear for the concerning parties as well" (T. van Damme, personal communication, 04 May 2020).

A possible solution for this is given by Matt and Schaeffer (2018). Larger universities should consider building sub ecosystems within their larger ecosystem, for example for software or biotech entrepreneurship. This can be done by centralizing all the information and access to resources typically needed by a certain type of venture. In order for this to be worthwhile, universities must have strong faculty to build around, and enough resources to coordinate such an effort. In the near future, KICK is planning to categorize students that come for guidance into trajectories based on the type of venture they want to create (M. van den Heuvel, personal communication, 27 May 2020), which suggests that KULeuven might be building such sub ecosystems. Considering the extensiveness of the LRD and the in-house expertise KULeuven possesses this seems like a smart move. In order to do this, KICK might consider installing faculty entrepreneurship officers to help students connect to these sub ecosystems.

Another interesting finding from the interviews can help centers of entrepreneurship facilitate student entrepreneurship better. Of the 3 interviewed counsellors, one indicated that they acted as a dealmaker. The counsellor at DO! revealed their extensive history as an entrepreneur, and believes it allows them to be of extra value for those who need guidance, especially those without a strong personal network (T. van Damme, personal communication, 04 May 2020). "I use quite some personal relations, lawyers, marketing specialists, these are more informal, they like to help young people. They provide guidance and advice for free, it's all-volunteer work, they do it because I asked them and because they want young entrepreneurs to succeed. I do not send everyone towards them. I only send them if it is useful and if the student is ready. If this later involves into a collaboration, then even better"(T. van Damme, personal communication, 04 May 2020). As such, universities could better facilitate student entrepreneurship by installing coaches or counsellors that have the personal network to act as dealmakers which have been identified by Spigel (2015) as important for a successful ecosystem. However, the large majority of students seeking guidance are in the discovery stage, and do not require dealmakers so installing these should be viewed as a luxury, not a requirement.





## **6. Conclusion**

So, how do universities facilitate student entrepreneurship? The literature review reveals that entrepreneurship can be seen as the process of recognition, evaluation and exploitation of opportunity. In order to be successful at this, students need the skills and resources that allow them to recognize, evaluate and exploit opportunity. Therefore, in order to facilitate student entrepreneurship, universities should create activities so students can acquire these entrepreneurial skills and resources. However, the process of entrepreneurship is extremely heterogeneous. Every individual has a different level of entrepreneurial knowledge and experience, and the important skills and resources vary depending on how far along a student is in the process of entrepreneurship. Therefore, universities should organize their activities and initiatives to provide a continuum of support.

This continuum of support should cover all phases of the venture creation process, from student with no entrepreneurial aspiration to new (and successful) business owner. Activities in this continuum can be categorized based on their purpose. Activities are meant to inspire students and pique their entrepreneurial interest, educate students and foster cognitive abilities to evaluate and develop feasible ideas, or incubate the students and their (nascent) venture. However, there is a limit to how much support a university can offer by themselves, and they aren't the only stakeholders of student entrepreneurship.

Just like any form of entrepreneurship, student entrepreneurship is heavily influenced by the context, and it doesn't occur in an isolated university context. The regional context and by extension the various regional stakeholders play an important role as well. Therefore, in order to improve their continuum of support universities can recruit and coordinate with various regional players. As such, universities can facilitate student entrepreneurship by creating student entrepreneurship ecosystems, a context conducive to student entrepreneurship where various stakeholders work together to provide a continuum of support.

During the empirical study student entrepreneurship support at each university is examined and evaluated using the SEEM and student entrepreneurship ecosystem frameworks. The empirical study reveals that viewing the facilitation of student entrepreneurship as a continuum of support provided by an entrepreneurship ecosystem holds merit, thereby validating both frameworks. Both papers had called for validation through case studies (Jansen et al., 2015; Wright et al., 2017). Various characteristics and relationships of their ecosystems were identified, and approaches by the different universities were compared and discussed. Additionally, obstacles for ecosystem growth were identified, and suggestions for improvement are offered. In conclusion, in order to effectively facilitate student entrepreneurship, universities cultivate an entrepreneurial ecosystem that provides a continuum of support through activities designed to inspire, educate and incubate student entrepreneurs.



## **7. Limitations and avenues for further research**

There are a few important limitations that influence the ability to generalize the findings of this study. Originally, the empirical study was meant to include data on the number of students that receive guidance and how many officially start a venture to provide an indication as to how well each university was doing at facilitating student entrepreneurship. However, as only data from one university was available this was omitted. However, this is a qualitative study that was designed to identify expected elements and examine the nature of their relationships, so this does not threaten this study's validity. Additionally, by combining a document study with interviews this study can be viewed as having internal validity. A bigger threat to the generalizability of these findings has to do with the number of interviewees. Due to the corona pandemic, only 3 of the 5 planned interviews could be conducted in time. While expanding the study to 5 universities would improve generalizability and provide valuable insights into more varied approaches, enough evidence was found to conclude that the findings have external validity, and are relevant and in fact do reflect how universities facilitate student entrepreneurship.

Perhaps the chief limitation is related to the boundaries of ecosystems. When is an actor considered part of an ecosystem? Where does one ecosystem end and another start? Should student entrepreneurship ecosystems be considered as separate ecosystems within a region, or is there one regional ecosystem that can become conducive to student entrepreneurs? Ecosystems themselves are purely conceptual and only take form in the minds of individuals that wish to describe the dynamic relationships between actors that they consider part of the ecosystem. As such, those studying the ecosystem determine its components and its boundaries. However, by using the framework provided by Wright and colleagues (2017) this study does gain content validity.

There are multiple avenues for future research. An important and under researched aspect of ecosystems is their life-cycle and their evolution over time. Therefore a qualitative longitudinal study interviewing the same counsellors can provide insights into how ecosystems develop, how individual initiatives have evolved and what challenges universities might encounter. Additionally, expanding the empirical study to other universities can be beneficial. As more ecosystems are evaluated and compared, more transferable findings can be identified. Individual initiatives can be examined as well.



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## **9. Appendix**

### **Interview protocol:**

Research question:

How do universities facilitate the evolution **from nascent entrepreneur\* to new-business owner?**

\*A nascent entrepreneur is the term used in literature for someone who has undertaken steps to start their own business (such as creating a business plan, doing a market survey or finding potential business partners), but hasn't set the business up (no VAT number or official registration).

### **Introductory questions**

1. How long has your institution offered extra-curricular entrepreneurial guidance and support?
2. What does this entail?
  - Are you a dedicated department, or are you a subdepartment?
  - How many employees are working on entrepreneurial guidance and support?
  - Which functions are there and could you give me a short job description?
  - Which facilities do you offer (incubators)?
3. How successful would you say your institution has been at stimulating student entrepreneurship?
  - How many students are enrolled at your institution, and how many have sought aid?
  - How many students that have sought aid have officially started a venture (have a VAT number)?
  - Are there any plans to expand?

## **Main questions**

### **The initiation of support**

1. Does your institution offer different levels of support for different types of ventures?
  - If there is a differentiation, how is this made?
2. Could you describe the process of initial contact between yourself and a student seeking guidance?
3. Could you describe the process after the initial contact?
4. Have you noticed any relation between the engagement level of students (i.e involvement with your institution/ network, particular courses, events) and the likeliness of them taking entrepreneurial action?

### **General key elements of students moving on to a startup**

5. Which traits do you find are most important for an entrepreneur to be successful?
6. What are in your experience the key reasons for students interested in being an entrepreneur to ultimately not start up their business?

### **Educational Support**

7. What types of educational support does your institution offer?
  - What are you aiming to teach students through this support?
8. What feedback have you received from students enjoying educational support?
  - Which questions do students still have that seem to be less well addressed by current educational support?
9. Are there plans to increase the offering of educational support (i.e new types of courses, more courses, guidance)?

How involved are other faculty members ( professors)?

### **Informal Networks**

10. Do you organize any initiatives aimed at cultivating a students informal network (i.e business clubs, networking events, pitch events)?
- How do you believe that it helps students form a network?
  - Are students interested?
  - Did you notice an impact on the student (entrepreneurs) after this initiative had been launched?
  - Do you think that you could improve existing initiatives, or create new ones?
11. Research suggests that informal networks are more important in the earlier stages of nascent entrepreneurship and become gradually less important as the nascent entrepreneur comes closer to starting their business.
- Do your experiences reflect this?
  - Why do you think this might be?

### **Formal Networks**

12. Do you work together with public entities to help students with their business creation efforts?
- Which public entities do you work with?
  - Do you actively create initiatives together? Do you share resources?
13. Do you work together with private entities to help students with their business creation efforts?
- Which private entities do you work with?
  - Do you actively create initiatives together? Do you share resources?
14. Research has found that formal networks become more important as the nascent entrepreneur gets closer to officially starting a business.
- Do your experiences reflect this?
  - Why do you think this might be?

### **Regulatory Support**

15. A students perception of regulatory support through regulations and laws, has been shown to affect the likelihood of them taking entrepreneurial action.
- How do you help students navigate regulatory support?
  - Do you provide in-house counselling on these matters?
  - Do you engage formal networks to help?
  - Do you organize any events to spread information about regulatory support?

### **Self-Efficacy**



Self-efficacy is the term used in literature to describe someone's confidence in their ability to reach a certain goal, and is thought to have a strong influence on an individual's likelihood to take entrepreneurial action.

- Do your experiences reflect this?
- How big of an issue is (the lack of) self-efficacy for students seeking guidance?
- (How) does your institution address self-efficacy?

### **Fear of Failure**

Fear of Failure refers to the risk aversiveness of an individual, and is thought to have a strong influence on an individual's likelihood to take entrepreneurial action.

- Do your experiences reflect this?
- How big of an issue is fear of failure for students seeking guidance?
- (How) does your institution address fear of failure?