

Understanding the emergence of the university-based entrepreneurial ecosystem: comparing the university and company actors perspectives

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**UNDERSTANDING THE EMERGENCE OF THE UNIVERSITY-BASED
ENTREPRENEURIAL ECOSYSTEM: COMPARING THE
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6. UNDERSTANDING THE EMERGENCE OF THE UNIVERSITY-BASED ENTREPRENEURIAL ECOSYSTEM: COMPARING THE UNIVERSITY AND COMPANY ACTORS' PERSPECTIVES

Katja Lahikainen

INTRODUCTION

Entrepreneurial ecosystems promote entrepreneurship within specific regional boundaries. They consist of a set of interdependent actors that aim for new value creation, the creation of spin-offs and start-ups as well as new jobs through entrepreneurial activities (Spigel, 2017; Stam, 2015). The distinctive feature of the entrepreneurial ecosystems is that they enable entrepreneurs to identify market opportunities and offer local resources, support and financing to grow new high-growth ventures (Spigel and Harrison, 2018).

Recently, universities have been identified as important contributors in entrepreneurial ecosystems (Belitski and Heron, 2017; Isenberg, 2010; Stam, 2015). Universities can provide a large variety of resources to entrepreneurial ecosystems: new technologies that create entrepreneurial opportunities (Lawton Smith et al., 2014); human capital (teaching activities), knowledge capital (technology and research) and entrepreneurship capital (creation of spin-offs and entrepreneurial mindset) (Audretsch, 2014; Guerrero et al., 2016; Huang-Saad et al., 2018). Additionally, universities may play an important role in creating and connecting entrepreneurs in their networks, thereby enabling entrepreneurs to acquire resources, knowledge and support from the actors of the entrepreneurial ecosystem (Spigel and Harrison, 2018). University-based entrepreneurship ecosystems can be researched as sub-systems of larger regional or local entrepreneurial ecosystems (Cavallo et al., 2018; Fuster et al., 2019) or as entrepreneurial ecosystems on their own (Greene et al., 2010; Miller and Acs, 2017). This study focuses on investigating a university-based entrepreneurial ecosystem on its own. This study defines the university-based entrepreneurial ecosystem (U-BEE) in accordance with Hayter (2016) as *the strategic and collective actions of various organizational components in order to maximize both the entrepreneurial and innovative contributions of universities.*

Research on U-BEE is still in a nascent stage and tends to focus on a narrow view on entrepreneurship that is limited to studies on new venture creation (Bishchoff et al., 2018). The current research has focused on investigating organizational structures, curricular and extra-curricular study programmes and support services, like technology transfer offices (TTOs), from the university point of view (Belitski and Heron, 2017; Greene et al., 2010; Hayter, 2016). Previous studies have acknowledged the importance of non-academic contacts of academics, diverse governance, openness and decentralization of activities as factors that enhance university-based entrepreneurship (Hayter, 2016; Miller and Acs, 2017). Spiegel and Harrison (2018) posit that university knowledge spillovers are important in entrepreneurial ecosystems, yet still less important than the universities' role as producers of skilled entrepreneurs and workers. This study addresses this statement by investigating university and company actors' perspectives on the different roles of the university in promoting entrepreneurship in the region. The objective of this study is to provide new insights on the immature theory of university-based ecosystems. The specific aim of the study is to compare the different perspectives of the university and company actors towards the university as a producer of new knowledge and start-ups and as a producer of skilled entrepreneurs and workforce. The research questions are: How do university and company actors perceive the university's role as a catalyst for entrepreneurship? Which factors constrain and reinforce the interaction between the companies and universities in the university-based entrepreneurial ecosystem? This study brings out the factors that enhance and hinder the emergence of U-BEE. The study presents the findings of an inductive case analysis of the university-based entrepreneurial ecosystem that is formed around a Finnish university campus.

This chapter is structured as follows: After this brief introduction, the literature on entrepreneurial ecosystems is reviewed. The following section presents the research method, including a short description of the case, as well as provides detailed information on the data collection and data analysis process. The findings of the study are then presented, focusing on four themes that emerged during the data analysis process. The chapter is concluded by discussing the main conclusions and implications of the study.

UNIVERSITY-BASED ENTREPRENEURSHIP ECOSYSTEMS (U-BEE)

In entrepreneurial ecosystems, entrepreneurs form the core of the ecosystem (Stam, 2015). The entrepreneurial ecosystems consist of social, material and cultural attributes. The success of entrepreneurial ecosystems is based on the interaction of these attributes that provide benefits and resources to entrepreneurs (Spigel, 2017). In regional entrepreneurial ecosystems, universities can be considered as one of the key material attributes (Isenberg, 2010; Spigel, 2017). The main social attributes include networks, investment capital, mentors and dealmakers, and worker talent. The cultural attributes consist of attitudes and histories of entrepreneurship (Spigel, 2017).

In a similar vein, UBEEs consist of similar attributes as entrepreneurial ecosystems in general. According to Brush (2014), the key dimensions of U-BEE are stakeholders, resources, infrastructure and culture. The stakeholders include internal and external stakeholders that have different needs, connections and motivations. Resources include for example, intellectual knowledge and research capabilities, physical facilities, and monetary and human resources. The infrastructure includes elements related to connectivity, for example technological platforms as well as formal and informal networks. Culture includes the symbolic aspect, norms, values and traditions (Brush, 2014). A distinctive feature of U-BEE is that entrepreneurship activities revolve around curricular, co-curricular and research activities and that they can be implemented by university staff, students or specific organizational structures of universities, such as TTOs or incubators (Greene et al., 2010; Brush, 2014).

U-BEE can emerge as a proactive or reactive response to the internal or external needs of a university (Lahikainen et al., 2018). In a proactive development, the university creates for example new educational or economic initiatives, whereas in a reactive development the university may address the unfulfilled needs of students or local entrepreneurs (Rice et al., 2014). The academics tend to collaborate with their like-minded social networks. In order to increase market-oriented motivations, values and practices, academics need to bridge the gap between the traditional academic networks and more entrepreneurial market-oriented entrepreneurial networks (Hayter, 2016). The engagement of faculty members and students with the outside world is crucial for developing U-BEE, since U-BEE can be attractive for the local companies because of the academic freedom that its students and faculty members enjoy (Miller and Acs,

2017). However, the development of U-BEE is not an endeavour of a single active and engaged individual; instead, it requires a team of people and the involvement of all stakeholders to be successful (Rice et al., 2014). Additionally, some of the faculty would rather focus on research and teaching that are the traditional tasks of universities (Lahikainen et al., 2018) than participate in entrepreneurial activity. This means that universities need to complement the faculty staff with staff members who excel in both traditional tasks and entrepreneurship (Rice et al., 2014).

The entrepreneurs and company representatives are the most frequently involved external stakeholder groups in U-BEE. Moreover, the collaborative partners tend to be small and medium-sized companies. Collaboration with large companies is favoured in case SMEs are underrepresented in the region (Bishchoff et al., 2018). University spin-offs can have an important role in U-BEE by acting as a knowledge hub that transfers the knowledge and connects U-BEE to wider business ecosystems. In order to reinforce these interactions, the universities should develop a proactive strategy to support university-based spin-offs, for example, through the intermediate functions like TTO and university-focused venture capital (UVC) (Fuster et al., 2019).

Empirical research highlights the need for a coordinated stakeholder management approach to strengthen the university-based entrepreneurial ecosystem through strong and focused stakeholder networks and collaboration (Bischoff et al., 2018). The universities have a potentially important role to play in the promotion of regional entrepreneurship, but they face challenges in societal interaction, especially in the commercialization of research outcomes (Lahikainen et al., 2018), and not all faculty want to be entrepreneurs (Huang-Saad et al., 2018). Additionally, the identified challenges usually relate to the orientation of universities and the transactions involved in for example conflicts over IPRs and dealing with university administration. Trustful long-term relationships can lower these barriers, whereas increased scrutiny and formalized relationships can increase the transaction-related barriers (Bruneel et al., 2010). Universities can have a strong influence on the specialization of regions. The successful re-orientation of industry depends on different factors, for example, organizational and incentive structures of universities as well as the universities' capacity to establish external links with their regional stakeholders (Braunerhjelm, 2008).

METHOD

This paper presents the findings from the case analysis of the U-BEE that is formed around Lappeenranta University of Technology (LUT). LUT, established in 1969, is located outside the capital region in southeast Finland. The region is by tradition dominated by large industry, but due to the industrial restructuring in recent years, the company base has become more diverse. Even so, the region is still lacking in start-ups and SMEs.

Since its establishment, LUT has had extensive collaboration with industrial partners. LUT is strongly focused on seeking high-tech solutions that combine technology and business in the field of cleantech. In 2015, *Times Higher Education World University Rankings* awarded LUT for business interaction. LUT's latest strategy, launched in 2014, includes entrepreneurship in its mission, stating that LUT will be the first Finnish entrepreneurial university and emphasizing the broad scope of entrepreneurial actions. In actions related to new business creation, LUT collaborates closely with Saimaa University of Applied Sciences (Saimaa UAS), located in the same campus area. The role of Saimaa UAS is to provide, amongst others, practical applications for the inventions originated from LUT research. The campus formed by the LUT and Saimaa UAS has centralized support services for research and innovation services, including a TTO and an investment company. The campus has a leading role in the region in promoting entrepreneurship and establishing new knowledge-intensive start-up companies.

This study is based on an exploratory qualitative research approach with the aim of developing a more comprehensive and nuanced understanding of the university campus as an entrepreneurial ecosystem, and on the factors that constrain and reinforce the interaction between the university and local companies within the university-based entrepreneurial ecosystem.

Data collection

In order to get a more comprehensive and nuanced understanding of the phenomenon that is the emergence of U-BEE, conversational thematic interviews were conducted. The interviews had a duration of 20–60 minutes each and they were conducted between February and August 2016. The purposive sampling technique was used (Saunders et al., 2016) and the interviewees were selected based on the previous knowledge of the persons who are active members in the U-BEE. The dataset comprises 22 in-depth interviews consisting of ten interviews made among

company actors and 12 interviews of academic and administrative staff members of LUT and Saimaa UAS. The titles and organizations of the interviewees are described in Table 6.1. All six university-based spin-offs and start-ups are high-tech growth companies whose expertise is based on the university research. The informants from the companies are either managing directors of the companies or experts who regularly collaborate with the university. The selected informants from LUT are researchers who have been active in research commercialization projects of the university. The informants from Saimaa UAS have been actively involved in the commercialization projects that are based on university research. Administrative staff from both higher education institutions (HEIs), who are involved in innovation and commercialization actions, were also selected for the interviews.

< INSERT TABLE 6.1 TITLES AND ORGANIZATIONS OF THE INTERVIEWEES ABOUT HERE >

The aim of the interviews was to shed light on and recognize the factors that foster or hinder entrepreneurship in U-BEE. The university interviewees were encouraged to talk about their perceptions on the entrepreneurial and commercial activities as a part of their work. Similarly, the company representatives were asked to describe the ways of interaction with the university, emphasizing the university's role in fostering entrepreneurship in the region. All the interviews were recorded and transcribed. Confidentiality was guaranteed to all the interviewees, and hence the interview quotations here – which are free translations from Finnish – are anonymous. Each interview followed its own path. However, the interviews covered four main themes, namely networking and collaboration, governance and leadership, and barriers and support. First, regarding networking and collaboration, the interviewees were asked to name the most central actors in the ecosystem, describe the kind of interaction and collaboration they had, name the most important means of collaboration and, finally, give examples of the successful and less successful outcomes of entrepreneurial actions. The second theme, governance and leadership, covered topics related to the strategic support of the university to enhance entrepreneurship in the region. Lastly, the interviewees were requested to provide information about organizational barriers and support.

Data analysis

The data analysis followed the inductive thematic data analysis method introduced by Gioia et. al (2013). The analysis method was chosen because it is suitable especially for elaborating new concepts and ideas (Gioia et al., 2013). The data analysis followed the approach of composing 1st order and 2nd order analysis – the approach that enables making the links between data and concepts visible (Gioia et al., 2013).

The analysis was started by using NVivo software. Very thorough coding was made of all the aspects (phases and sentences) that seemed relevant concerning the research questions. After a closer look of the codes, 75 codes were selected for further study and exported to an Excel file. In the Excel file, each code was marked in a way that all the excerpts that belonged to different codes could be traced back to their original sources.

Furthermore, the codes were organized in the Excel file by grouping and deleting the codes and excerpts that began to seem irrelevant in terms of the research questions of this study. The grouping was continued by looking for similarities and differences among the codes. This resulted in 20 codes for describing company perspectives and 17 codes describing the perspectives of the HEIs. As suggested by Gioia et al. (2013), the informant-centric wording was used when naming the codes. As a result, these categories were given phrasal descriptions that became the 1st order concepts.

At the second level of analysis, similarities and differences were looked for among the 1st order concepts. Within this, group comparisons were made among company and university informants, as well as inter-group comparisons between the company and university informants. Altogether four 2nd order themes were created by using the research-centric terminology in naming the themes.

At the third level of analysis, the emergent 2nd order themes were further distilled into three aggregate dimensions that together form the preliminary data structure of this research (Figure 6.1).

During the data analysis process, already existing theoretical frameworks were sought to be ignored in order to avoid a potential guiding effect of the existing theories in data analysis (Gioia et al., 2013). However, the data analysis process was an iterative process that consisted of

moving among data, emerging patterns and the literature until the final dataset settled in its final structure (Eisenhardt, 1989).

<INSERT FIGURE 6.1 DATA STRUCTURE ABOUT HERE>

FINDINGS

This section describes the findings of the data analysis. The findings are structured according to the themes that emerged based on the second level coding. The constructed 2nd order themes are: 1) *Scientific excellence and focusing*; 2) *Strong dyadic relationships*; 3) *Formal structures as hindering factor*; and 4) *Outsourcing entrepreneurship* (see Figure 6.1). The numbers in brackets after each quotation in Tables 6.2–6.9 refer to the number of each informant as indicated in Table 6.1.

Scientific excellence and focusing

From the company and university points of view, the most critical and important task of the university is to educate the experts to meet the needs of the industry. In research and education, successful collaboration is based on scientific excellence and clear focus areas. Both company and university actors emphasized these success factors. Clear focus areas and research quality are the key preconditions for the companies to get the best possible workforce. The university graduates act as important intermediaries in knowledge transfer from the university to industry. Tables 2 and 3 present the 1st order concepts and the selected representative data on scientific excellence and focusing from the company actor (Table 6.2) and university actor (Table 3) points of view.

< INSERT TABLE 6.2. SCIENTIFIC EXCELLENCE AND FOCUSING –
COMPANIES ABOUT HERE>

Company actors perceive that the most important task of the university is to educate the experts to meet the demands of the industry. In terms of research collaboration, the university is

expected to be a problem solver of very concrete challenges of the companies – the kinds of problems that offer intellectual challenges for the professors and their students. Research as well as education must be based on the world-class knowledge that is competitive on global markets. The university must provide top knowledge that can be combined with the top expertise that companies have. The university has managed to make its focus areas known, since the companies have recognized them. They have also concentrated the collaborative actions and built the teams around those areas.

<INSERT TABLE 6.3. SCIENTIFIC EXCELLENCE AND FOCUSING –
UNIVERSITY ABOUT HERE>

Correspondingly, university actors emphasized combining practical relevance and scientific excellence in all their actions. This applies especially to the School of Energy Technology at LUT that has practical relevance within scientific rigour as a guiding rule. The school is very focused in its actions. The research groups are formed based on the selected focus areas, and team members are selected based on their academic competences as well as their abilities to collaborate with other team members and industry. Like their industrial counterparts, the university actors emphasized the students as the key actors to transfer the research knowledge to the markets. One of the degree programmes of the School of Technology was even established to serve the existing companies, and with the aim of creating new companies in the region. One of the founding members of the degree programme mentioned that they had considered stopping the programme a number of times during its existence, since the collaboration with the industry was very limited at certain points, and they concentrated solely on scientific work without practical relevance.

Strong dyadic relationships

The collaborative actions between the companies and university are based on tight personal relationships between the company actors and senior professors or researchers. The company actors emphasize tight relationships with professors and experts in their field. However, at the same time they acknowledge that wider networking would bring benefits both to companies and

the university. The university actors highlight the collaboration with large companies and seek more collaboration with SMEs and interdisciplinary collaboration among their colleagues. The emerged concepts and representative data are presented in Tables 6.4 and 6.5.

<INSERT TABLE 6.4. STRONG DYADIC RELATIONSHIPS – COMPANIES ABOUT HERE>

< INSERT TABLE 6.5. STRONG DYADIC RELATIONSHIPS – UNIVERSITY ABOUT HERE>

The company actors have established tight dyadic relationships with the professors or senior experts in their field. They highlighted the symbiosis that was created by people – not by any intentional process - based on strong personal relationship. The symbiosis had blurred organizational boundaries, with staff members working simultaneously for the benefit of the university and company with or without an official employment contract.

Despite the benefits of having close dyadic relationships, the company actors acknowledge that wider networking would be beneficial for the university and companies as well as the surrounding region. Collaboration is easy and smooth for the company actors, who have managed to form close personal contacts with the university experts. According to the informants, the university has traditionally concentrated on large companies. However, it was noted that during recent years the university has become a more active actor in the region and approached SMEs in a more active and regular manner. However, the university was still expected to be more active and easily approachable for the SMEs that do not have personal contacts with the university professors and researchers.

The university actors acknowledge that they prefer to collaborate with large companies due to the persevering nature of the university research. Large companies have more capacity to invest and commit their time for the university projects compared to SMEs. Additionally, university actors feel that business and technology experts work in their own silos within the university. More collaboration would be needed, especially in the projects that aim to develop new business from the research outcomes.

Formal structures as hindering factor

Despite the fact that the case university is rather small and considered to be agile, the bureaucracy typical for universities cannot be avoided. Bureaucracy increases the participation costs of projects, which particularly hinders SMEs' participation in the university projects. Additionally, finalizing formal agreements even in smaller projects can be time-consuming and complicated. Company and university perspectives on administrative challenges are described in Tables 6.6 and 6.7.

<INSERT TABLE 6.6. FORMAL STRUCTURES AS HINDERING FACTOR – COMPANIES ABOUT HERE>

Participating in the projects initiated by the university is challenging, especially for the SMEs which are seldom able to contribute to the projects financially. Instead, they tend to contribute in kind by working for the project without asking for compensation. However, SMEs have a willingness to participate in project work, since it provides them with an avenue for new research knowledge and the possibility for networking.

Almost all interviewees emphasized that the problems related to bureaucracy stem from the centralized university administration structures. The professors are the ones who act as buffers and intermediaries between the administration and companies. The interviewees stated that bureaucracy mainly manifests in delays in schedules. While large companies are less vulnerable, delays in university outputs can have a severe impact on the business operations of newly established start-ups.

< INSERT TABLE 6.7. FORMAL STRUCTURES AS HINDERING FACTOR – UNIVERSITY ABOUT HERE>

Similarly, university actors also recognize the problem areas of bureaucracy and high costs of university services. They know that SMEs are unable to participate in bigger projects that require their own funding. Additionally, they acknowledge that the university should change the pricing policy and lighten the administrative burden especially when SMEs are involved. Lighter

administrative processes would enable the university itself to participate in smaller assignments initiated by the companies and vice versa, which in turn would give SMEs better possibilities to participate in university projects.

Outsourcing entrepreneurship

The university's role as a locus of new spin-offs and start-ups is seen as a challenging one. Company actors emphasized that commercialization of research outcomes is difficult due to their very technical nature and low readiness level for the markets. Additionally, company actors share the view that professors and researchers lack the passion that is needed for new business creation. In a similar vein, university actors recognized that they lack the needed business expertise. Moreover, the commonly shared concern is that there are not enough potential entrepreneurs, neither at the university nor in the surrounding region. Concepts and selected representative data related to these challenges are highlighted in Tables 6.8 and 6.9.

<INSERT TABLE 6.8. OUTSOURCING ENTREPRENEURSHIP – COMPANIES ABOUT HERE>

In general, the company actors had doubts about the overarching goal that has been set on the university to foster regional entrepreneurship. In their opinion, it should not be solely the university's responsibility for several reasons. First, companies are not established by an external push. As one interviewee put it: *'things do not happen they are done.'* Professors seldom have the entrepreneurial passion and will to act. Second, university-based inventions are very technical and difficult to commercialize. In many cases, a more sensible solution would be to offer the invention to the existing companies rather than trying to commercialize them within the university. Third, the university could have a more entrepreneurial culture. There are many concrete ways to foster entrepreneurship, for example including entrepreneurship in curricula as much as possible in the most concrete manner. Lastly, entrepreneurship is also about changing attitudes, and that does not happen only through university teaching but also through upbringing at home and through informal activities.

< INSERT TABLE 6.9. OUTSOURCING ENTREPRENEURSHIP – UNIVERSITY ABOUT HERE >

The main concern of the university actors was finding potential entrepreneurs, especially finding them among the students. Since the researchers lack the passion and needed competences for starting up a business, they would like to outsource the commercialization activities and concentrate on the research. The professors are looking for mechanisms that would help in finding the potential entrepreneurs. They also acknowledge that even if students are eager and have the right attitude in commercialization projects, they lack the deeper understanding of the specific business area and the different application areas of the technology in question.

CONCLUSIONS

The objective of this study was to provide new insights on the emerging literature on U-BEE. Based on the thematic analysis, four themes were constructed and analysed in the findings section. These themes can be further distilled to three aggregate dimensions, which are material, social and cultural attributes (Spigel, 2017).

This study confirms the statement that, in the entrepreneurial ecosystem, university spillovers are less important than the university's role as a provider of entrepreneurs and qualified workforce (Spigel and Harrison, 2018). According to the findings, the most important task of the university from the company and university actors' perspective is to educate the experts to meet the demands of the industry. However, this case shows that education of the workforce is expected to be based on scientific excellence that is competitive on global markets, meaning that strong material attributes form the firm ground for the emergence of U-BEE. The transfer of technology and human talent is supported by flexible ways of working, for example by blurring organizational boundaries, as well as by increasing double contracting and internships between the university and companies.

Social interaction between the companies and the university takes place mainly through strong dyadic relationships between the senior academics and company representatives. This case proves that the university's tendency to scrutinize and formalize the relationships increases transaction-related challenges (Bruneel et al., 2010). These transaction-related challenges can

become severe problems for SMEs in case they are treated with the same manner as larger companies. The company actors are of the opinion that university administration creates additional bureaucracy, which can be avoided by having trustful dyadic relations with the senior academics in the faculties. This finding contradicts the earlier study, suggesting that a coordinated stakeholder management approach is needed to strengthen the U-BEE (Bischoff et al., 2018).

As the importance of scientific excellence and educating a high-quality workforce is unquestionable, the university's role as a promoter of regional entrepreneurship is more debatable. The basic elements of entrepreneurial culture – the attitudes and histories of entrepreneurship (Brush, 2014; Spigel, 2017) – seem to be in place. However, both company and university actors have concerns regarding the university as a locus of new start-ups and spin-offs, and they tend to share the view that new venture creation should be outsourced from the university. The reasoning behind this opinion is twofold. First, university-based inventions and their applications were seen as being excessively technology-focused and difficult to commercialize, and they would be better utilized if they were offered to existing companies in the first place instead of having the university try to commercialize them. Secondly, it was emphasized that new business creation requires genuine commitment and passion from the potential entrepreneurs. Academics often lack the needed will to become entrepreneurs (Huang-Saad et al., 2018), meaning that potential entrepreneurs need to be found outside the university. Similarly, the university actors also have their reserved attitude towards the university's role as a catalyst for start-ups and spin-offs. They believe that the most efficient interaction mode is joint projects with existing companies, in which the resulting IPR is to be transferred to the companies. The professors see that they lack the needed expertise for commercialization actions and that the mechanisms by which for example students could be involved in the commercialization projects do not exist. The professors consider the creation of start-ups to be important, but the fuzz around start-ups might downsize the importance of knowledge transfer through research and education in the form of IPRs and a high-quality workforce.

In sum, this case confirms that a close and trustful relationship with non-academic contacts (Hayter, 2016; Miller and Acs, 2017) are important factors that reinforce the interaction in U-BEE. However, the close dyadic relationships hinder the further networking within the university and among companies, especially among SMEs that are not active members in U-BEE. This

reinforces the interaction vertically but hinders horizontal networking across different disciplines and different fields of industry. This case confirms that the selection of a clear focus area enhances the university's role in the re-orientation of the commercial sector in regions (Braunerhjelm, 2008). However, focusing enhances the special industrial cluster to be developed but neglects the entrepreneurs in other sectors and hinders them to acquire resources and support from the university (Spigel and Harrison, 2018).

Finally, it should be noted that this study has some limitations. First, the company and university actors that were selected for the interviews are all active members in the emerging U-BEE. This fact may result in biased research results. Second, the U-BEE of this study is located in southeast Finland with specific regional characteristics. Additionally, the U-BEE analysed in this study has a strong technological focus specializing in cleantech. For this reason, the results of the study might not reflect the reality in U-BEES in other contexts. To address these gaps, future research could investigate the perceptions of non-active members of U-BEE and select different types of U-BEES in different regions for further investigation. Moreover, as the education of the entrepreneurs and high-quality workforce seem to be the most important task of the university in U-BEE, future research could focus on investigating how students are engaged in U-BEE as active and engaged members through teaching and research.

IMPLICATIONS

This study brings new insights to the immature theory of U-BEE by bringing out the factors that constrain and reinforce the emergence of U-BEE. The current literature on U-BEE has focused on investigating organizational structures and support services like TTOs (Belitski and Heron, 2017; Greene et al., 2010). This study goes beyond investigating organizations and curricular and extra-curricular study programmes, but it gives voice to individuals: faculty, entrepreneurs and other company actors. The study highlights that entrepreneurship promotion in U-BEE is not only about technology transfer and the creation of high-growth companies. The findings of this study pinpoint the importance of entrepreneurial culture and social relations, which do not receive enough attention in current empirical models and theories that emphasize formal structures and support mechanisms. Additionally, the current theories tend to neglect the students as important intermediaries and stakeholders in U-BEE.

For the practitioners, policymakers and higher education management, this study provides evidence about the importance of considering U-BEE as a wider phenomenon than technology transfer and new business creation. Expectations for the universities in creating new businesses should not be set too high; rather, they should strengthen their role as educators of entrepreneurs and workforce, as well as providers of scientific solutions to practical problems that stem from the needs of industry. This can be done by increasing awareness of entrepreneurship education among teachers, involving students in research commercialization projects and company assignments in a more systematic manner, and by minimizing the bureaucracy when collaborating with SMEs. Additionally, double contracting and internships of academics in the industry could be further enhanced.

Universities tend to centralize innovation and entrepreneurship-related functions. These centralized functions might have their role, but they cannot replace the dyadic relationships between companies and faculty. As the interaction in the entrepreneurial ecosystem is mainly based on informal social relationships between the faculty members and company actors, universities should avoid centralizing all entrepreneurship-related functions. Instead, they should decentralize them and their coordination. Certain senior academics enjoy a strong position among their company partners, and they have created trustful relationships with each other. Therefore, the companies prefer to collaborate with their academic counterparts directly rather than involving administrative structures in collaboration.

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