Students’ perceptions of the entrepreneurial culture in Finnish higher education institutions

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Abstract
The purpose of this study is to add to the literature on entrepreneurial universities by investigating entrepreneurial culture (EC) in higher education institutions (HEIs). The authors investigate how students experience EC and which factors explain their perceptions of EC. The study is based on a survey of HEI students in Finland with 1277 responses. The results show that formal institutional support and institution-level activities have the strongest impact on the students’ experienced EC. According to the findings, formal institutional support has a greater impact on students’ perceptions of EC than student-driven activities. Furthermore, the results highlight that the encouragement of teachers has a greater influence on students’ perceptions of EC than peer students and student-driven activities. Accordingly, the paper’s theoretical contribution to the literature lies in its demonstration that institutional support, in addition to the encouragement of teachers, influences HEI students’ perceptions of EC. With regard to practical implications, the findings indicate that, if HEIs wish to build an EC and operate entrepreneurially, it is vital to support teachers’ entrepreneurial behaviour and thinking. In addition, equal emphasis needs to be placed on the observable artefacts and on clear, well-communicated organisational structures and processes.

Keywords
Entrepreneurial universities, entrepreneurial culture, entrepreneurship, higher education institutions, students, Finland

The development of entrepreneurial universities is a common trend in higher education around the world, although the transformation of universities towards becoming entrepreneurial has taken diverse implementation paths from country to country (Sam and van der Sijde, 2014). This transformation is linked to broader educational policy changes. Higher education institutions (HEIs) are facing increasing external pressures in terms of reduced public funding (de Zilwa, 2007) and expectations that they should increase their contribution to regional prosperity (Etzkowitz, 2014). They are playing a more active role in the knowledge infrastructures of their regions and are acknowledging their crucial role in interactive, regional and national innovation processes (Trippl et al., 2015). Furthermore, they are developing 21st century skills among students and fostering their entrepreneurial spirit (Gafar, 2020). The promotion of entrepreneurship education has been an important topic on European policy agendas in the last few decades (European Commission, 2013), and it has been addressed in various strategy papers worldwide (Turner and Mulholland, 2018).

Responding to these pressures, HEIs have aligned their strategies and developed their educational and innovation activities and thereby adopted the task of entrepreneurship promotion. Guerrero and Urbano (2012) suggest that the

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entrepreneurial university is a complex construct defined by a combination of informal and formal external and internal factors. Creating an enabling institutional environment, which involves visible leadership, clarity of purpose, embedding of entrepreneurial culture and capacity building, is one of the key actions of universities in entrepreneurship promotion.

The entrepreneurial culture (EC) that exists among university administrators, faculty members and students is a crucial precondition and one of the key pillars of an entrepreneurial university (Etzkowitz and Zhou, 2017: 93–94; Gjerding et al., 2006: 3). Wong (2014) explains that the concept of EC has evolved both in the entrepreneurial culture and broader management literature and thus it has taken on various meanings depending on the perspective. EC in general refers to values, attitudes, beliefs, assumptions, norms and behaviours related to entrepreneurship in a certain cultural context. On a national level, EC refers to a country’s social values and attitudes with regard to entrepreneurship and academic study of this phenomenon largely explores the relationship between national culture and entrepreneurial activity. In addition, exploring EC on an organisational level has raised increased interest. In such studies, EC has been characterised as a type of organisational culture which embodies and embraces entrepreneurial characteristics and attributes, such as opportunity recognition, creativity, risk-taking and innovation. (Wong, 2014) Thus, in the HEI context, as Geissler et al. (2010: 15) suggest, entrepreneurial culture exists when university members act in an entrepreneurial fashion.

However, research on EC at HEIs per se is scarce (Clauss et al., 2018), and the question of how HEIs can contribute to the building of a favourable institutional environment through education, entrepreneurial support and network functions has, in particular, lacked academic interest (Davey et al., 2016). Hence, it is crucial to explore how the members of the university community perceive the institutional environment of the university and how these perceptions shape their views on entrepreneurship at their university (e.g. Geissler et al., 2010).

Research on the entrepreneurial university itself and its units, as well as perceptions of faculty, have received a lot of attention in the academic literature (Clauss et al., 2018). Prior research on entrepreneurial universities has focused on technology transfer, the commercialization of knowledge, changes in the university paradigm, and performance management and economic growth (Forlano et al., 2021; Mascarenhas et al., 2017). Nevertheless, studies exploring students’ perceptions of EC are limited (Clauss et al., 2018). Earlier research shows that both organisational and individual factors influence students’ perceptions of entrepreneurial conditions at HEIs (e.g. Bergmann et al., 2018; Geissler et al., 2010). Bergmann et al. (2018) examined students’ perceptions of the entrepreneurial climate in their university. The results indicated that in general students had only a vague idea of the different ways in which their university supported entrepreneurial thinking and acting, and that the students’ perceptions were more influenced by general university characteristics (such as size and reputation) than the actual entrepreneurship measures (Bergmann et al., 2018). Geissler et al. (2010) explored the impact of organisational factors on students’ and faculty members’ perceptions of the entrepreneurial climate at their university. Geissler et al. (2010) suggest that for students the existence of an entrepreneurship qualification programme is one of the most crucial factors shaping their perceptions of the university’s entrepreneurial climate. However, as these studies suggest, there is a need for further research, especially at the micro-level, on the factors that influence students’ EC perceptions.

This study investigates students’ perceptions of entrepreneurial culture in HEIs and thereby adds new knowledge on the role of HEIs in creating an enabling environment for entrepreneurship.

To address the identified research gap, we analysed a large quantitative dataset on Finnish HEI students’ perceptions to answer the following question: how do students experience HEIs’ entrepreneurial culture, and what factors predict their perceptions of an entrepreneurial culture? To answer this research question, we take a closer look at the role of institutional support, teachers’ encouragement, peer student support and students’ participation in entrepreneurship societies as predictors of EC.

**Theoretical framework**

**Entrepreneurial culture in HEIs**

An entrepreneurial university provides support to foster entrepreneurship and innovation among the university community (Guerrero and Urban, 2012) by stimulating entrepreneurship capital, which consists of entrepreneurial thinking, actions and institutions (Audretsch, 2014). Furthermore, an entrepreneurial university promotes an entrepreneurial culture through its governance structures and managerial policies and practices (Guerrero et al., 2014; Hamon, 2013).

The concept of EC, rooted in organisational culture literature (e.g. Schein, 1985), has been widely applied in the management and entrepreneurship literature, and in the last 20 years this discussion has been extended to the university sector (Clark, 1998; Gibb et al., 2013; Wong, 2014). Fostering an entrepreneurial culture is seen as one of the key building blocks for developing entrepreneurship in HEIs (Afriyie and Boohene, 2014; Clark, 1998). For instance, Clark (1998) states that the formation of EC at a university may start as a simple institutional idea related to change, later elaborated into a set of beliefs which – if they are diffused
throughout the ‘academic heartland’ – may grow into a university-wide culture strongly anchored in practices. However, an EC is a multi-faceted concept and can thus convey various meanings, which make conceptualisations of it difficult (Wong, 2014). Thus, before setting out the meaning of EC in this study, it is relevant to start with the conceptualisation of organisational culture. Acknowledging the diversity of perspectives on organisational culture, we applied Schein’s (1988) view on the subject.

According to Schein’s (1988: 8) often cited definition, organisational culture is ‘a pattern of basic assumptions, invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore is to be taught to new members as the correct way to perceive, think, and feel in relation to those problems’. Schein’s (1988:10–11) further explains that organisational culture can be understood as a set of taken for granted assumptions, underlying values and visible and observable artefacts, such as organisational structures, processes, espoused values, strategies, goals, ideals, norms, standards and statements by leaders or the management.

The concepts of organisational culture and organisational climate are often used interchangeably, since they overlap with each other and are somewhat closely related, although the concepts stem from different intellectual traditions (Schneider et al., 2013). In this study, we use the concept of culture as it refers to how people feel about the organisation (Schein, 2000). Prior research (Wong, 2014: 1, 29–30; Ireland et al., 2003: 970) suggests that EC can be seen as a distinct form of organisational culture which embodies entrepreneurial characteristics such as opportunity recognition and risk-taking, innovativeness, creativity and the pursuit of change. As Hannon (2013) elaborates, the creation of EC starts with building governance structures, managerial policies and environments that encourage the development of an entrepreneurial mindset and behaviour within the organisation. Hence, if an HEI seeks to become known as an entrepreneurial organisation, the promotion of entrepreneurship must be considered and embedded in all its actions and practices. Otherwise, the values displayed are not consistent with those espoused (Peltonen, 2014).

In this study, we focus on exploring students’ perceptions of the visible and observable layer of EC, such as HEIs’ espoused values, the observable behaviour and attitudes of staff members and observable support systems. This choice has been made because exploring the deeper layers of EC, such as underlying assumptions and the ultimate sources of values and actions, would require multiple different measurement approaches and an intensive and interactive process of enquiry. Furthermore, as the general student population is usually not aware of how extensively their university supports entrepreneurship (Bergmann et al., 2018), asking them to assess the EC in terms of these deeper levels would probably result in only vague assumptions, the visible and observable layer of culture can also be conceptualised as climate (Schein, 1988, 2000).

Based on Schein’s (1988) definition, learning and encouragement through formal and social interaction are central ways to sustain and transmit organisational values and norms of behaviour. Wong (2014) follows the same lines by proposing that learning and development support are connected to an entrepreneurial culture. Universities’ entrepreneurial outputs consist of formal factors such as entrepreneurial, organisational and governance structures, support measures for entrepreneurship and entrepreneurship education. Informal factors consist of the university community’s attitudes towards entrepreneurship, entrepreneurial teaching methodologies and role models (Guerrero and Urbano, 2012; Guerrero, et al., 2016; Urbano and Guerrero, 2013). Based on the definition of organisational culture and the factors influencing entrepreneurial outcomes of universities, next we develop our hypothesis regarding EC in HEIs.

**Institutional support**

Entrepreneurial universities have put an emphasis on creating different formal organisational units that give support to all stages of entrepreneurship – from latent entrepreneurial intentions to the launch and growth of ventures. These units include, for example, entrepreneurship centres, incubators, accelerators and technology transfer offices (Cunningham et al., 2021).

Entrepreneurial culture in HEIs involves structural elements such as control systems, organisational and power structures (bundled with rituals and routines), stories and symbols (Handscombe, 2003; Kothari and Handscombe, 2007). However, not all members of an organisation may experience an organisational culture in the same way and there may be different sub-cultures within an organisational culture (Lindahl, 2006). This may lead to different perceptions of EC. For example, stories at an entrepreneurial university may focus on campus millionaires, alumni enterprise heroes and spin-off success stories, rather than on emphasising the achievements of senior staff and the hiring of research professors. Similarly, the rituals and routines at such a university may focus more on entrepreneurial events and the celebration of innovation than on degree ceremonies and visits by governmental officials (Handscombe, 2003).

According to Bergmann et al. (2018, 2016), university characteristics and entrepreneurship support have an impact on student entrepreneurship. The university’s characteristics especially have an impact on the nascent entrepreneurial activity of students (Bergmann et al., 2016). Additionally, according to Geissler et al. (2010), qualification programmes seem to have the largest impact on students’
perceptions of the entrepreneurial climate at their institution. In contrast, Walter et al. (2013) did not find a significant relationship between entrepreneurship support programmes and the entrepreneurial intentions of students. However, they found that organisation-level factors played an important but gender-specific role in students’ entrepreneurial intentions. For example, their study revealed that entrepreneurship-related education increased only male university students’ entrepreneurial intentions. Taking these aspects into consideration we formulate our first hypothesis.

1. H1: Institutional support for entrepreneurship predicts students’ perception of EC.

Our first hypothesis involves formal support structures provided by HEIs, including entrepreneurship education, start-up support, facilities and entrepreneurial events. The following hypotheses include informal support given by teachers and peer students as role models, as well as student-led entrepreneurship clubs.

**Encouragement of teachers and peer students**

Though institutional support structures are crucial, teachers and their individual activities in the classrooms are central in implementing HEIs’ entrepreneurship strategies in practice (Neck and Gorbett, 2018). Several studies have highlighted teachers’ significance in promoting entrepreneurship in educational institutions (e.g. Matlay, 2011; Peltonen, 2015; Ruskovaara and Pihkala, 2013). Teachers are key players in developing curricula, study programmes and the learning environment, and thus in facilitating and enabling students’ entrepreneurial learning. They have an important role also in nurturing EC in universities since they interact very closely with the students (Kothari and Handscombe, 2007) and act as entrepreneurial role models for them (Fayolle et al., 2006; Peltonen, 2014). This is not to say that teachers need to be successful business owners, but that they set an example of how to create, recognise and exploit opportunities and to explore innovative ways of doing things. In the teaching context this means the readiness and ability to challenge traditional teaching practices and to try out evidence-based entrepreneurial teaching methods that support students’ entrepreneurial learning. However, it should be noted, as prior research has indicated (Peltonen, 2014, 2015), that teachers’ readiness to encourage students by adopting new pedagogical practices is linked with institutional support structures, such as HEIs’ pedagogical strategies and the training available for teachers.

Along with encouragement from teaching staff, prior research suggests that encouragement by peer students has an especially positive effect on students’ entrepreneurial learning (Kubberød et al., 2018) and entrepreneurial ambitions and intentions (Davidsson and Honig, 2003). A study by Bergmann et al. (2018) shows that peers also affect students’ perceptions of how entrepreneurship is encouraged in universities. Taking these aspects into consideration, we present our next two hypotheses.

2. H2: Teachers’ encouragement in support of entrepreneurship predicts students’ perception of EC.

3. H3: The positive attitudes of peer students predict students’ perceptions of EC.

**Students’ entrepreneurship clubs**

Prior research shows that student-led initiatives, such as students’ entrepreneurship clubs (also called entrepreneurship societies), play a substantial role in the emergence of EC in HEIs (Lahikainen et al., 2018; Parkkari and Kohtakangas, 2018). Student-led entrepreneurship clubs are informal, non-accredited entities that complement entrepreneurship education in HEIs by offering extracurricular activities (Pittaway et al., 2011, 2015). These activities include, for example, idea generation, business planning and support, networking events and competitions (Pittaway et al., 2015). The main goal of these clubs is to attract students who are interested in learning about entrepreneurship and developing entrepreneurial skills for the purposes of starting their own business or developing their entrepreneurial mindset (Pittaway et al., 2011). Student associations have a positive impact on students’ entrepreneurial intentions (Padilla-Angulo, 2019). In particular, students’ entrepreneurship clubs can play a major role in the development of the EC of universities, and they may even impact the development of EC in the wider society (Björklund and Krueger, 2016; Farny and Kyrö, 2015; Parkkari and Kohtakangas, 2018). For students, entrepreneurship clubs are vehicles for gaining entrepreneurial skills that are needed in preparing for the uncertain future of working life and for starting a business, cultivating transferable skills, gaining practical experience and finding personal enjoyment (Pittaway et al., 2011). Furthermore, to encourage students to consider start-up entrepreneurship, these groups bring peers together and nurture an entrepreneurial atmosphere by fostering a sense of community and belonging (Parkkari and Kohtakangas, 2018). Taking these aspects into consideration we present our fourth hypothesis.

4. H4: Participation in entrepreneurship clubs predicts students’ perceptions of entrepreneurial culture.

**Data and methods**

**Data**

There are several ways to investigate the EC in HEIs. As an organisational culture is largely a social construct, one method of exploring it is to examine the opinions of...
different stakeholders, such as managers, instructors and students, who take part in the formation of the culture and who are also influenced by it (Turker and Altuntas, 2015). This study focuses on students’ perceptions and is based on a process of collecting information for a wider national project that aimed to identify entrepreneurship and innovation capacity in Finnish HEIs. The data are owned and were gathered by the Finnish Education Evaluation Centre using an online questionnaire in 2017. A survey link was sent to each Finnish HEI’s contact person, who forwarded the link to all their students.

In total, 2460 students responded to the questionnaire. For this study, we selected for analysis those respondents who had taken entrepreneurship or innovation studies (1038 students) or who had accumulated experience in entrepreneurship elsewhere (239 students). Therefore, the data for this study are drawn from 1277 HEI students.

Entrepreneurship and innovation studies ‘refers to courses, modules, major or minor subjects and entrepreneurship-oriented degree programmes.

This study includes responses from 865 students who studied at 24 universities of applied sciences and 412 students from 14 universities. Accordingly, the respondents represented all Finnish HEIs. About 67.7% of the respondents were studying at a university of applied sciences (UAS) and 32.2% at traditional research universities. Most (61.3%) were female. All fields of education were represented. Students studying economics, administration and law formed the largest student group (35.3%). Technology and ICT students represent 19.2% of respondents and students studying healthcare and wellbeing accounted for 16.4%. Characteristics of the respondents are presented in Table 1.

In order to understand more about the students’ perceptions of the EC in HEIs, a set of items based on the aforementioned literature was created, including questions examining how fellow students and staff discuss entrepreneurship, how students are encouraged to engage in it, how entrepreneurship is supported, and whether the respondents had participated in any activities arranged by student-led entrepreneurship societies. We will now present the selected 17 items, pointing out the most crucial references and the scales used.

The items

The first items are about how the students perceived entrepreneurship was discussed and encouraged in their HEIs. There is a wide range of studies highlighting the importance of peers and how they affect students’ perceptions. Moreover, teachers’ roles in promoting entrepreneurship have proven to be crucial and they can be seen as role models (Kothari and Handscombe, 2005; Matlay, 2011; Peltonen, 2014, 2015). Based on earlier studies, five items were formulated, to which the students responded by selecting answers on a five-point Likert scale, ranging from totally disagree (1) to totally agree (5). The students were asked ‘In your opinion, how well do the following claims apply to your university community?’, and the items were:

1. The staff talk about entrepreneurship in a positive manner.
2. The staff encourage students to become entrepreneurs.
3. The staff encourage students to select entrepreneurship studies.
4. The staff encourage students to take part in entrepreneurial activities.
5. My study mates talk about entrepreneurship in a positive manner.

The next set of five items had to do with how the students perceived entrepreneurship to be supported in their HEI. They were asked to respond ‘Yes’ (1) or ‘No’ (0) to the

| Gender       | N  | %  |
|--------------|----|----|
| Male         | 494| 38.7|
| Female       | 783| 61.3|
| Type of HEI  |    |    |
| University   | 412| 32.3|
| UAS          | 865| 67.7|
| Field of education |    |    |
| Education, humanities and arts (including languages) | 137 | 10.7 |
| Economics, administration and law | 451 | 35.3 |
| Natural sciences, agriculture and forestry | 108 | 8.5 |
| Technology and ICT | 245 | 19.2 |
| Healthcare and wellbeing | 210 | 16.4 |
| Other | 126 | 9.9 |

Notes: HEI: higher education institutions; UAS: university of applied sciences.

*aInformation and communications technologies.

*bSocial sciences, communications and information sciences, services.

Table 1. Characteristics of the respondents (N = 1277).
statements provided. They also had the option to respond with ‘I don’t know’ – we recoded these responses to ‘0’ as they showed that the students did not recognise the supporting elements. Prior work has shown that university characteristics have an impact on students’ perceptions. These organisational-level characteristics may encompass having a dedicated person responsible for entrepreneurship (Bergmann et al., 2018), entrepreneurship events (Kothari and Handscombe, 2007), support for student start-ups (Bergmann et al., 2016) and other support services (Geissler et al., 2010; Walter et al., 2013), as well as exposure to entrepreneurship through information distributed via various channels (Geissler et al., 2010). The students were asked ‘How is entrepreneurship supported at your HEI?’ and the items were:

6. Information on entrepreneurship studies is easily accessible.
7. Students are given the names of those responsible for entrepreneurship studies or promoting entrepreneurship.
8. Graduating students may use the HEI’s facilities for their entrepreneurial activities (on lease or at no charge).
9. Experts at my HEI help students in starting a business (support services).
10. My HEI arranges entrepreneurship events for students.

Earlier studies have identified that student-led entrepreneurship clubs and societies inspire students to pursue entrepreneurship (Padilla-Angulo, 2019) and prepare them with skills and practical experience that may prove useful in entrepreneurship (Pittaway et al., 2011). Furthermore, a substantial majority of Finnish HEIs have a student-led club called an ‘entrepreneurship society’ (ES). Therefore, it was crucial to ask questions related to ES entities. The questionnaire listed all 20 of the societies existing at the time, by name, to assist the students in identifying them. Four items were created, with the respondents being instructed to select the one(s) describing their activities. The scale for these statements was yes (1) and no (0). The items for ‘Student entrepreneurship societies (ES) and participating in their activities’ were:

11. I am an active member of an ES (a board member or a member who is active in other ways).
12. I have been to one or more events organised by an ES.
13. I have heard about ES activities and am interested in what they are doing, but I have not yet participated in their work.
14. I don’t know what ‘ES’ means and have not participated in any such events; I’m not interested.

The last set of items forms the dependent variable of our study. It measures EC, and it was formed based on previous literature on organisational (Schein, 1988) and entrepreneurial culture (Wong, 2014). In line with these definitions, we assume that the entrepreneurial culture in HEIs is reflected in formal and informal factors such as degree programmes, the university’s strategy and the university community’s attitude towards entrepreneurship (Geissler et al., 2010; Guerrero and Urbano, 2012; Hannon, 2013; Urbano and Guerrero, 2013). In these variables, a five-point Likert scale was used, ranging from totally disagree (1) to totally agree (5). The variable consisted of the following statements linked to the question ‘In your opinion, how well do the following claims apply to your own university community?’:

15. The content of the degree programme allows students to study entrepreneurship.
16. Entrepreneurship is discussed in the strategy of my university.
17. An entrepreneurial attitude and entrepreneurship are highly valued at my university.

Next, we present the methods used for analysing our data.

Method

The large quantitative dataset was analysed using the IBM SPSS Statistics (version 26) computer software package. First, we analysed the students at a general level; for example, how they perceived entrepreneurship, and whether their HEI seemed to value, promote and support entrepreneurship. Next, to reduce the large number of variables into a more compact form, we formed four sum measures – for encouragement, institutional support, entrepreneurial culture and student community. The reliability of the sum variables was tested, after which we conducted ANOVA tests for the measures in regard to the background variables characterising the respondents. Finally, by using a linear regression analysis, we examined how particular elements explained the students’ perceptions of EC.

Results

About half (52.6%) of the respondents found information on entrepreneurship studies to be easily accessible and recognised (47.9%) that their HEI arranged entrepreneurship-related events. Interestingly, nearly 60% of the students did not know whether there were designated people responsible for promoting entrepreneurship, and about one-third (32.4%) indicated that experts at their HEI helped students with their business start-ups. Approximately 85% agreed that the staff spoke positively about entrepreneurship,
and a substantial majority (71.7%) stated that the staff encouraged them to become entrepreneurs and that they felt encouraged to take part in entrepreneurial activities (74%). For us, these results indicate that, while the results are positive in many respects, entrepreneurship has not reached its full potential concerning visibility or in terms of promotion and awareness. Our results correspond with earlier research indicating the significant role of teachers in the promotion of entrepreneurship (Matlay, 2011; Peltonen, 2015; Ruskovaara and Pihkala, 2013). That said, our findings contradict the study by Geissler et al. (2010), who did not detect a direct influence between the positive attitudes of faculty members toward entrepreneurial activities and students’ perceptions of the EC.

Next, for a more in-depth understanding of the respondents’ perceptions of their HEI’s EC, we constructed four new sum measures. These are named encouragement, peer students, entrepreneurial culture and student community (Table 2 presents the variables in more detail). The first three of these sum measures, encouragement, institutional support and entrepreneurial culture, were tested via a confirmatory factor analysis and Cronbach’s alpha reliability tests. The alphas varied between 0.720 and 0.892, which can be regarded as satisfactory. The values for encouragement and entrepreneurial culture varied between 1 and 4 and for institutional support between 0 and 5. For studying the role of entrepreneurship societies on the students’ perception of EC, we created a new sum variable, labelled student community, to describe students’ familiarity with the entrepreneurial student societies. The respondents receive the highest score if they are active members in an ES and, correspondingly, they score 0 if they do not recognize the concept of ES or have not participated in ES events. The new sum measure ranges from 0 to 3, with a mean of 0.48. Further, to understand the peer students’ role in more depth, one item (frequency between 1 and 5) was utilised. The item was: ‘My study mates talk about entrepreneurship in a positive manner (peer students)’.

To gain a broader understanding, we considered the new sum measures in the light of the respondent characteristics (Table 1). Table 3 describes the ANOVA results, which point to highly significant gender-specific differences in how fellow students’ role, institutional support and student community are perceived. These findings support earlier research showing student entrepreneurship to be gender-biased (Walter et al., 2013). According to our analysis, male students scored higher in all the studied sum variables; however, the perceived encouragement and entrepreneurial culture were not dependent on the student’s gender.

Furthermore, university and UAS students differed significantly. The UAS students perceived their teachers’ encouragement, institutional support and entrepreneurial

| Measure                                                                 | Mean | SD  |
|------------------------------------------------------------------------|------|-----|
| Encouragement (Cronbach’s alpha: 0.89)                                 | 3.61 | 1.02|
| 1 The staff talk about entrepreneurship in a positive manner           | 3.89 | 1.07|
| 2 The staff encourage students to become entrepreneurs                 | 3.50 | 1.19|
| 3 The staff encourage students to select entrepreneurship studies       | 3.47 | 1.24|
| 4 Staff members encourage students to take part in entrepreneurial activities | 3.57 | 1.20|
| Peer students                                                          |      |     |
| 5 My study mates talk about entrepreneurship in a positive manner       | 2.86 | 0.89|
| Institutional support (Cronbach’s alpha: 0.74)                        | 1.95 | 1.66|
| 6 Information on entrepreneurship studies is easily accessible          | 0.53 | 0.50|
| 7 My HEI arranges entrepreneurship events for students                 | 0.48 | 0.50|
| 8 Students are provided with the names responsible for entrepreneurship | 0.42 | 0.49|
| 9 Experts at my HEI help students in the start-up of their business    | 0.32 | 0.47|
| 10 Graduating students may use the HEI’s facilities for entrepreneurial | 0.21 | 0.41|
| activities                                                              | 0.48 | 0.83|
| Student community                                                      |      |     |
| 11 I am an active member of an ES (e.g., a board member)                | Yes  | 3.9%|
| 12 I have been to an event(s) organised by an ES.                       | Yes  | 10.0%|
| 13 I have heard about ES activities and I’m interested in them but have not yet participated | Yes  | 15.7%|
| 14 I don’t know what ES means/there are no ES activities at my university | Yes  | 70.4%|
| Entrepreneurial culture (Cronbach’s alpha: 0.72)                       | 3.94 | 0.91|
| 15 The content of the degree programme allows students to study entrepre | 3.97 | 1.20|
| 16 Entrepreneurship is discussed in the strategy of my university       | 3.64 | 1.12|
| 17 An entrepreneurial attitude and entrepreneurship are highly valued at my university | 3.92 | 1.08|

Notes: ES: entrepreneurship society; HEI: higher education institutions.
culture more positively, whereas university students’ perceptions were interestingly higher for both student-related elements (peer students and student community). Additionally, the field of education seems to have a crucial role in how the students perceived the elements studied there. That is, different fields of education were significantly different from each other with regard to encouragement, peer students, institutional support, student community and entrepreneurial culture.

Next, we ran six regression analyses, comparing six fields of education to learn whether the selected variables (encouragement, peer students, institutional support and student community) predicted how the students perceived the EC. We also controlled the effect of student’s gender and the type of HEI. First, the experienced encouragement for entrepreneurship was highly significant for all the students, no matter which field of education they came from. This highlights the teachers’ decisive role, and it is in line with earlier studies (e.g. Matlay, 2011; Peltonen, 2015; Ruskovaara and Pihkala, 2013) and confirms the second hypothesis: ‘Teachers’ encouragement predicts students’ perception of EC’. We found that gender did not explain the students’ perceived EC. Furthermore, only amongst students studying the natural sciences did the type of HEI have a significant impact on the experienced EC. Due to the practical orientation of the UASs and their stipulated role in regional development, they are considered to be more supportive of entrepreneurship than traditional research universities (Bergmann et al., 2016, 2018; Lahikainen et al., 2018; Viljamaa and Moisio, 2015). Therefore, it is surprising that in this comparison of HEIs only one field of education shows a significant difference.

According to our model, peer students play an interesting role. Students in the fields of economics, technology and health found that their peers affected their experienced EC. This finding partially supports the third hypothesis. Our analysis revealed that institutional support played a significant role in the experienced EC. Therefore, this finding lends strong support to our first hypothesis (‘Institutional support is positively related to students’ perception of EC’) and is in line with earlier studies (Bergmann et al., 2016, 2018). Additionally, the analysis concerning entrepreneurship societies produced interesting results; only in one out of six fields of education did the ES have a significant effect on students’ perceived EC, and interestingly that field was the ‘other field’, representing less than 10% of the respondents. Therefore, our fourth hypothesis (‘Participation in entrepreneurship clubs positively affects students’ perception of entrepreneurial culture’) did not gain support. This finding brings new knowledge to the field. Earlier studies have shown that students’ entrepreneurship clubs may play a major role in the development of the EC of universities (Björklund and Krueger, 2016; Farny and Kyrö, 2015; Parkkari and Kohtakangas, 2018). Based on our results, we posit that the influence of students’ entrepreneurship societies is strongly context-specific, meaning that there are few examples of highly impactful societies. However, when considering entrepreneurial clubs in general, they do not manage to attract the interest of large student populations as identified in previous studies.

### Table 3. ANOVA results for encouragement, peer students, institutional support, student community and entrepreneurial culture.

|                        | Encouragement | Peer students | Institutional support | Student community | Entrepreneurial culture |
|------------------------|---------------|---------------|-----------------------|-------------------|------------------------|
| Gender                 |               |               |                       |                   |                        |
| Male                   | 3.61          | 3.65          | 2.19                  | 0.61              | 3.85                   |
| Female                 | 3.60          | 3.33          | 1.80                  | 0.39              | 3.84                   |
| F-value (sign)         | 0.01          | 22.04***      | 16.43***              | 21.41***          | 0.00                   |
| Type of HEI            |               |               |                       |                   |                        |
| University             | 3.21          | 3.59          | 1.75                  | 0.78              | 3.59                   |
| UAS                    | 3.79          | 3.39          | 2.04                  | 0.33              | 3.96                   |
| F-value (sign)         | 90.39***      | 7.59**        | 7.92**                | 90.47***          | 46.09***               |
| Field of education     |               |               |                       |                   |                        |
| Administration, law    | 3.89          | 3.81          | 2.38                  | 0.56              | 4.0                    |
| Technology and ICT     | 3.48          | 3.46          | 2.05                  | 0.67              | 3.80                   |
| Natural sciences,       | 3.39          | 3.47          | 1.34                  | 0.40              | 3.68                   |
| Agriculture, forestry  | 3.42          | 2.96          | 1.58                  | 0.25              | 3.68                   |
| Healthcare and wellbeing | 3.23        | 3.15          | 1.38                  | 0.31              | 3.45                   |
| Education, humanities, fine arts | 3.75 | 3.33 | 1.96 | 0.42 | 3.91 |
| F-value (sign)         | 14.30***      | 17.65***      | 14.57***              | 8.32***           | 14.26***               |

Notes: HEI: higher education institutions; UAS: university of applied sciences.
*p < 0.05. **p < 0.01. ***p < 0.001.
Prior literature (e.g. Sam and van der Sijde, 2014; Guerrero et al., 2016) has demonstrated, the development of an entrepreneurial university is a result of a combination of internal and external determinants. One of the crucial preconditions is an EC among faculty members, students and university administrators (Etzkowitz and Zhou, 2017: 93–94; Gjerding et al., 2006: 3). Hence, it is crucial for HEIs that are striving to be more entrepreneurial to scrutinise how different university community members perceive the various factors affecting EC and thus have an impact on the creation and development of an entrepreneurial university.

However, exploring the EC in HEIs, especially from the students’ point of view, has not received much attention in the current literature on entrepreneurial universities. Acknowledging that EC is a multi-faceted construct, this study responds to this challenge and focuses on the students’ perspective, exploring how they perceive their HEI’s entrepreneurial culture, and which factors predict their perceptions. We analysed students’ perceptions based on four measures comprising EC in HEIs: encouragement, institutional support, the role of peer students and student communities. These measures included elements such as encouragement from fellow students and teachers, entrepreneurship promotion and student-led entrepreneurship clubs.

Our major finding draws attention to the importance of institutional support and institution-level activities (H1). These have the largest impact on the experienced EC. Our findings stress the key role of different support services, information, facilities and events of various sorts that HEIs provide for students. These findings contribute to and elaborate on previous research that has identified informal factors (e.g. attitudes and role models) as the most critical factors having impact on the entrepreneurial activities of universities (Guerrero et al., 2016). In other words, according to our findings, both university-driven and student-driven activities seem to have an impact on students’ perceptions of EC in their HEI. However, interestingly, the institution-level promotion had a greater impact on students’ perceptions of EC than did student-driven activities.

In terms of a theoretical contribution, these findings contribute to the existing literature on entrepreneurial university development by providing greater understanding of the critical factors that have an impact on the entrepreneurial activities of universities. Therefore, in terms of practical implications, our results highlight the need for institutions to provide students with information concerning entrepreneurship studies, to organise related events and to provide students with the names of those responsible for entrepreneurship promotion. An entrepreneurial culture and entrepreneurial practices have become prominent in HEI strategies (Guerrero and Urbano, 2012). Our findings point to the value of this by highlighting the significance that institution-level decisions and activities hold concerning students’ perceptions of EC. Irrespective of these encouraging results, however, space seems to remain for the stronger promotion of entrepreneurship. That is, HEIs could consider clarifying staff responsibilities and making the support services offered more visible to students.

Furthermore, as hypothesized, our results show that encouraging actions by teachers and their positive mindset towards entrepreneurship have a great influence on students’ perceptions of the EC in their university (H2). According to our results the effect of teachers’ encouragement is stronger than the positive attitudes of peer students (H3). Therefore, entrepreneurship promotion aimed at teachers is just as important as that aimed at students. This is consistent with prior studies (e.g. Matlay, 2011; Peltonen, 2014, 2015; Ruskovaara and Pihkala, 2013) which stress the significant role of teachers and emphasise the development of their entrepreneurial readiness (Peltonen, 2014, 2015).

### Discussion and conclusion

Universities strive to be more entrepreneurial in terms of their core missions (teaching, research and socio-economic contribution) to respond to the pressures and constantly changing needs of society and the external environment. As prior literature (e.g. Sam and van der Sijde, 2014; Guerrero and Urbano, 2012) has demonstrated, the development of an entrepreneurial university is a result of a combination of internal and external determinants. One of the crucial preconditions is an EC among faculty members, students and university administrators (Etzkowitz and Zhou, 2017: 93–94; Gjerding et al., 2006: 3). Hence, it is crucial for HEIs that are striving to be more entrepreneurial to scrutinise how different university community members perceive the various factors affecting EC and thus have an impact on the creation and development of an entrepreneurial university.

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### Table 4. Regression analysis of students’ perceptions of entrepreneurial culture.

| Variable                  | Humanities | Economics | Natural sciences | Technology | Health | Other |
|---------------------------|-----------|-----------|------------------|------------|--------|-------|
| Constant                  | 1.83***   | 1.53***   | 2.17***          | 1.73***    | 1.31***| 1.38***|
| Encouragement             | 0.40***   | 0.53***   | 0.36***          | 0.37***    | 0.53***| 0.61***|
| Peer students             | 0.09      | 0.08**    | 0.09             | 0.11**     | 0.10*  | 0.03  |
| Institutional support     | 0.28*     | 0.09***   | 0.16**           | 0.15***    | 0.10*  | 0.03  |
| Student community         | −0.11     | −0.04     | 0.09             | −0.09      | −0.04  | 0.15* |
| Gender                    | −0.04     | 0.11      | −0.05            | 0.19       | 0.15   | 0.15  |
| Type of higher education institutions | −0.09 | 0.04 | −0.52**** | 0.16 | −0.15 | −0.21 |
| R-square                  | 0.43      | 0.53      | 0.59             | 0.49       | 0.59   | 0.63  |

Note: *p < 0.05. **p < 0.01. ***p < 0.001.
Moreover, our results show that students’ perceptions differ between different disciplines; that is, institutional efforts and those made by teachers have an impact on students’ perceived EC. These findings may also have value on a practical level when targeting entrepreneurship promotion.

Earlier findings have suggested that students’ entrepreneurship clubs and societies facilitate student learning (Pittaway et al., 2015), have a positive impact on students’ entrepreneurial intentions (Padilla-Angulo, 2019), and enhance the development of an EC among students (Parkkari and Kohtakangas, 2018). Furthermore, earlier studies have shown that fellow students and student-led peer-to-peer learning activities have a positive effect on students’ perceptions of entrepreneurship (Bergmann et al., 2016). We hypothesized that participation in entrepreneurship clubs predicts students’ perceptions of entrepreneurial culture (H4). Our results do not support this hypothesis, although this finding should be taken with caution; the vast majority of students (70.3%) in our sample had not participated in any activities offered by student entrepreneurship societies, often not knowing what such a society involved. This indicates that ES activities need to be promoted more for all students with plenty of active communication.

Earlier studies have shown that student entrepreneurship is gender-biased (Walter et al., 2013). Our analysis only partially supports this. Our results show that peer students, institutional support and student community had a stronger influence on male students; however, the results suggest that gender does not explain the perceived EC.

In sum, our findings indicate that if HEIs wish to build an EC and operate entrepreneurially, it is vital to support teachers’ entrepreneurial behaviour and thinking. After all, from the students’ perspective, they are the key people promoting entrepreneurship and creating learning environments. Furthermore, equal emphasis needs to be placed on the observable artefacts (e.g. visible support services) and clear, well-communicated organisational structures and processes as on the values articulated in strategic guidelines.

**Limitations and future research**

Any research has its limitations and this study is no exception. First, as entrepreneurial culture in HEIs an emerging field of study, there is no single established theoretical framework for tackling this multidimensional construct with its various dimensions and elements (Wong, 2014). Therefore, we combined elements from several sources and fields of study.

In this work, we used a limited number of variables explaining EC to test our model. However, considering the multi-faceted nature of EC (Wong, 2014), there may be other items that would be fruitful for examining EC. Future studies might focus, for example, on the role of university management, organisational cohesiveness and passion for work. At the same time, more knowledge is needed regarding the impact of the observable artefacts on EC, such as dedicated entrepreneurship spaces and collaborative learning environments. In addition, it would be useful to study and clarify the role of university-business collaboration and to gain deeper understanding of its impact on entrepreneurship and EC. Further, as HEIs host a vast and growing number of international students, it would be interesting to study the impact of different cultural backgrounds on students’ perceived EC. In a similar vein, examining students’ perceptions of EC in HEIs in different countries could bring new insights.

Finally, with in-depth qualitative data, future studies could address the organisational values and the underlying cultural assumptions presented by Schein (1988). It would be interesting to study how the organisational values reported by the management of HEIs are reflected by the students. Moreover, the study of underlying cultural assumptions would bring out nuanced information on students’ motivation to participate – or not to participate – in entrepreneurial activities offered by HEIs.

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