



SEINÄJOEN AMMATTIKORKEAKOULU  
SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES

**This is an electronic reprint of the  
original article (final draft).**

Please cite the original article:

Joensuu-Salo, S. Peltonen, K., Oikkonen, E. Hämäläinen, M. & Arhio, K. 2020. The impact of entrepreneurial teaching: The mediating effect of the teacher's ease of performing university–business collaboration. *Journal of Finnish Studies*, 23 (2), 74 - 103.



**The Impact of Entrepreneurial Teaching:  
The Mediating Effect of the Teacher's Ease of Performing University–Business Collaboration**

*Sanna Joensuu-Salo, Seinäjoki University of Applied Sciences*

*Kati Peltonen, Lahti University of Applied Sciences*

*Elena Oikkonen, Lappeenranta University of Technology*

*Minna Hämäläinen, Lappeenranta University of Technology*

*Kaija Arhio, Centria University of Applied Sciences*

**Abstract**

Entrepreneurship is a multifaceted phenomenon that has a vital role in Finnish society. It has become a top priority in national government policies because of its significance as a driver of economic growth, creativity, and innovation. The crucial role of entrepreneurship has also been reflected in educational policies. The research field of entrepreneurship education has increased substantially during the last fifteen years. Several studies reveal the significance of entrepreneurship education, the essential elements of entrepreneurial learning, and the impact of entrepreneurship education on students' entrepreneurial competences. According to a number of studies, teachers play a crucial role in enhancing students' entrepreneurial competences. Collaboration between universities and businesses has been evoked as a good practice in entrepreneurship education. Nevertheless, there is still a great need for research on the relationship between the teachers in charge of entrepreneurship education and the implementations of university–business collaboration.

The objective of this study is to examine the effect of entrepreneurial teaching on teaching practices in entrepreneurship education. The authors of this paper contribute to deepening knowledge about this relation. They also increase the knowledge about the supportive role of university–business collaboration to teachers' adoption and diffusion of entrepreneurial teaching through a control variable of the ease of university–business collaboration. The empirical data for this study come from Finland, collected through an Internet survey. The results show that the teacher's perception of the ease of engaging in university–business collaboration has an indirect effect on the teaching practices used. On the other hand, the teacher's ability to implement entrepreneurial teaching has a positive direct relation to the ease of performing university–business collaboration, affecting also the use of versatile teaching methods.

*Keywords:* entrepreneurial teaching, teaching practices in entrepreneurship, Finnish higher education teachers, university–business collaboration

## 1. Introduction

During the last fifteen years, entrepreneurship education (EE) has increased substantially as a research field, and several studies have been carried out in order to open up the significance of entrepreneurship education and the essential elements of entrepreneurial learning (see, e.g., Rae 2010) and the impact of entrepreneurship education on students' entrepreneurial intentions (see, e.g., Fayolle and Gailly 2015). Entrepreneurship is a multifaceted phenomenon with a vital role in Finnish society. It has thus become a top priority in national government policies, and it is seen as one of the main drivers for economic growth, creativity, and innovation. Though general attitudes toward entrepreneurship in Finland are quite positive, according to a Global Entrepreneurship Monitor (GEM) report, entrepreneurial activity in Finland still remains low compared to the other European Union member countries (University of Turku 2016).

The promotion of entrepreneurship is not a new issue in the Finnish education system. The first stage in the promotion of entrepreneurship in Finland started already in the 1950s and 1960s, and since the mid-1990s, entrepreneurship education has been embedded in basic education, upper secondary, and vocational core curricula (Erkkilä 2000; Ministry of Education and Culture 2009). During the first decade of the twenty-first century, driven by EU policy recommendations, entrepreneurship education has gained a greater foothold in higher education. Entrepreneurship education embeds two partly overlapping strands: it seeks (1) to develop personal and generic entrepreneurial competences needed by everyone in working life and life in general and (2) to provide business knowledge and skills needed in new venture creation.

In 2006, the Ministry of Education and Culture and the Ministry of Trade and Industry together established a working group for promoting enterprise in higher education. Three years later, the first national strategy for entrepreneurship education was launched (Ministry of Education and Culture 2009). Later on, the role of the national strategy as a guiding framework for educational institutions has increased. Both Universities Finland UNIFI and ARENE (The Rectors' Conference of Finnish Universities of Applied Sciences) then launched their guidelines for entrepreneurship in higher education institutions. In 2016, the Ministry of Education and Culture (2016) launched the report, "Good Practices of Entrepreneurship Support in Institutions of Higher Education," which also provided information and support for business cooperation in the Finnish higher education field. In 2017, the Ministry of Education and Culture published updated national guidelines for entrepreneurship education, which advise and support educational institutions to initiate, strengthen, and develop their entrepreneurship education strategies and practices. According to these guidelines, entrepreneurship education in the educational context is seen as a broad approach that aims at 1) inspiring and shaping positive attitudes and mindset toward entrepreneurship among students and staff members, 2) increasing knowledge, and developing skills and entrepreneurial behavior of students, and 3) developing entrepreneurial learning environments and culture in educational settings. Corporate and working life collaboration is strongly intertwined with these aims (Ministry of Education and Culture 2017).

As can be seen, the Finnish education system has provided strong strategic support for promoting entrepreneurship. However, the latest study by the Ministry of Education and Culture (2016) shows, that there is wide variation in how Finnish higher education institutions implement the guiding frameworks and policies in their practices.

Although much entrepreneurial learning also takes place outside of formal education, educational institutions and teachers are important entrepreneurship stimulators (Rae and Carswell 2001). As previous research (Peltonen 2015; Ruskovaara and Pihkala 2013; Gibb 2011; Hannon 2006) indicates, teachers play a remarkable role in enhancing students' entrepreneurial competences. With their pedagogical choices and actions, teachers can both create and enable learning situations and

environments that challenge students to learn and strengthen their entrepreneurial mindset and orientation. The pedagogical choices of teachers also have an effect on students' entrepreneurial intentions. Varamäki, Joensuu, Tornikoski, and Viljamaa (2015) found that "active-based pedagogy" (i.e., a mix of project-based learning and traditional lectures) has a stronger, but indirect, effect on entrepreneurial intention than only lecture-based pedagogy. This is in line with the findings of Walter, Parboteeah, and Walter (2010), who found that activity-based modes of entrepreneurship education are more effective than reflective modes.

Recently, Lahikainen, Ruskovaara, and Pihkala (2018) argued for the crucial role of university staff, as they are in a key position to promote entrepreneurship. According to their findings, new approaches are needed to develop, and later on exploit, the potential that faculty members may bring. That is, there is a variety of teaching methods in entrepreneurship education. However, teachers are not necessarily familiar with them, nor do they make the most of them. Furthermore, there is a lack of studies that indicate why teachers select different kinds of teaching methods. Hence, there is still a need to emphasize and scrutinize the role of teachers as facilitators of students' entrepreneurial learning. Recently the perspective of entrepreneurial teaching (ET) has started to gain a greater foothold. Through entrepreneurial teaching, instructors can apply suitable teaching methods in entrepreneurship education (Heinonen and Poikkijoki 2006). This ability embeds deep understanding of 1) the needs of learners, 2) the context and goals of learning, and 3) the educational philosophical questions behind entrepreneurship education (Peltonen 2015; Hägg and Peltonen 2014). Koehler (2013, 7) suggests that an entrepreneurial teacher is one "who use[s] content knowledge and expertise to develop innovative educational opportunities that students value and seek out, and who build[s] connections between the school, the community, and/or society." In sum, entrepreneurial teaching can be seen as a broad professional and pedagogical orientation in how to develop students' entrepreneurial mindset and behavior. This orientation is then manifested in using relevant and activating teaching practices (Peltonen 2014). Earlier studies (e.g., Ruskovaara and Pihkala 2014) have suggested that especially working in pairs, group work, and other cooperative methods are frequently used by teachers. However, there is still a need to broaden the array of teaching practices applied in entrepreneurship education (Seikkula-Leino, Ruskovaara, Ikävalko, Mattila, and Rytkölä 2010). In recent years, university–business collaboration (UBC) has also often been raised as a good practice in entrepreneurship education. Yet more research is needed on the relationship between university–business collaboration and teachers' ability to implement versatile teaching methods in entrepreneurship education. In addition, there is a research gap in understanding how entrepreneurial teaching is linked in actual teaching practices in entrepreneurship education. Even though entrepreneurship education methods have been identified in earlier research, there exist no studies examining the effect of entrepreneurial teaching on the selection of actual teaching methods.

The main objective of this study is to examine the effect of entrepreneurial teaching on the teaching practices in entrepreneurship education. We aim to deepen understanding of this linkage and also contribute knowledge about how university–business collaboration can support teachers to adopt and sustain entrepreneurial teaching by introducing the ease of university–business collaboration as a control variable in the study. The context of the research is Finnish higher education. Hence, this study brings new knowledge about Finnish higher education teachers' ability to apply versatile teaching methods in entrepreneurship.

## 2. The Theoretical Framework

### Entrepreneurial Teaching (ET)

Entrepreneurial competence, as a general key competence, can be linked to any profession. It is about mindset and work orientation, which involve the ability to innovate, to take risks, and to initiate, plan, and lead actions and which further involve creativity and an innovative approach in order to reach the set goals (European Commission 2006). Hence, teachers' entrepreneurial competence can be seen "as an integrated conceptual construct drawing on the descriptions of a teacher's professional competencies and portrayals of entrepreneurial competencies" (Peltonen 2015, 16). This means that entrepreneurial competences in a teaching context are manifested in a readiness to create learning environments and methods that support the development of students' entrepreneurial competences (Peltonen 2015).

Defining entrepreneurial teaching is a rather complicated task, as the characterizations of ET are deeply intertwined with the illustrations of entrepreneurial learning (Peltonen 2014). In order to understand what entrepreneurial teaching is, we first need to understand what is meant by *entrepreneurial learning*. Gibb (1996, 315) was one of the pioneers who differentiated between conventional and enterprising teaching approaches and emphasized the importance of student-centered learning and learning in simulated or authentic learning environments. Jack and Anderson (1999) were also among the first scholars who brought up the question, "How can we improve the way we teach entrepreneurship?" Gibb and Price (2007, 17) define entrepreneurial teaching in the following way: "Entrepreneurial teaching is designed to maximize the potential for stimulating entrepreneurial attributes and insight and equipping participants for action." Bécharde and Grégoire (2005), as well as Kyrö and Carrier (2005) and Heinonen and Poikkijoki (2006), follow the same lines by proposing that entrepreneurial teaching can be understood as the ability to apply teaching methods that encourage and enhance the entrepreneurial expertise of students. In addition, it is essential that entrepreneurship educators have a positive attitude toward entrepreneurship and understand entrepreneurship and EE in a broad sense (Peltonen 2015; Backström-Widjeskog 2008; Kyrö, and Carrier 2005; Leffler 2002). Entrepreneurial teaching involves acting as an entrepreneurial role model in educational contexts, as well as creating learning environments that encourage and support the development of students' entrepreneurial competences (Hytti and O'Gorman 2004). This also embeds the ability to facilitate, coach, and guide students' entrepreneurial learning processes and the willingness to broaden the learning environment by networking with entrepreneurs and other external stakeholders (Suonpää 2013; Järvi 2013; Peltonen 2015; Gibb 2011; Heinonen and Poikkijoki 2006). In this sense, teachers have an important mediating role in enhancing students' entrepreneurial behavior.

Entrepreneurial teaching in practice means that teachers possess the abilities and willingness to adopt entrepreneurial pedagogy. This entails educational consciousness, which means that entrepreneurship educators should be aware of the underlying values and perceptions that guide their pedagogical choices and practices (Hägg and Peltonen 2014). In entrepreneurial teaching, it is also essential that educators possess the readiness to constantly reflect upon and renew teaching practices and develop cognitive, affective, and conative competences (Peltonen 2014, 125).

These characterizations of entrepreneurial teaching create an overall image of what entrepreneurial teaching is. However, the question of how to deliver teaching in an entrepreneurial way and how to create appropriate learning environments still presents a challenge to entrepreneurship educators (Klapper and Farber 2016). From the prior research literature, we can identify the following characterizations of entrepreneurial teaching and proposed pedagogical approaches:

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>● The student-centered approach and a focus on learning in simulated situations or in real-life learning situations</li> <li>● The multi-disciplinary approach to teaching and learning, preferably project- and process-based</li> </ul>                    | Gibb 1996   |
| <ul style="list-style-type: none"> <li>● The anti-positivistic approach and holistic learning by bridging the gap between theory and entrepreneurial practice using a number of techniques</li> </ul>   | Jack and Anderson 1999                                    |
| <ul style="list-style-type: none"> <li>● Action-based pedagogy that causes students to become active players in the learning process</li> </ul>   | Fiet 2000   |
| <ul style="list-style-type: none"> <li>● A focus on student-centered, active, and experiential learning</li> <li>● Master-apprentice, mentor-protégé, and peer-to-peer learning</li> </ul>  | Carayannis, Evans, and Hanson 2003                        |
| <ul style="list-style-type: none"> <li>● Adopting teaching methods that stimulate experiential and creative learning</li> </ul>   | Honig 2004; Jones and Iredale 2010; Neck and Greene, 2011 |
| <ul style="list-style-type: none"> <li>● Enabling long-term exposure to entrepreneurship by adopting a wide range of experimental learning methods and considering different learning styles</li> <li>● More focus on the environmental and cultural aspects of learning</li> </ul>                 | Kjellman and Ehrsten 2005                                 |
| <ul style="list-style-type: none"> <li>● Teachers provide freedom and opportunities for students and enhance their creativity</li> <li>● Teachers support collaborative learning and consider individual differences</li> <li>● Learning takes place everywhere (not only in classrooms)</li> </ul> | Kyrö 2005   |
| <ul style="list-style-type: none"> <li>● The entrepreneurial training program should be practically oriented</li> </ul>   | Klofsten 2000   |

|   |                                 |
|---|---------------------------------|
| <ul style="list-style-type: none"> <li>● Possession of theoretical knowledge of entrepreneurship together with learning activities in which students are prepared for the the real-world environment</li> </ul> | Todorovic 2004                  |
| <ul style="list-style-type: none"> <li>● Learning by doing; learning in small groups</li> </ul>   | Cachon and Cotton 2008          |
| <ul style="list-style-type: none"> <li>● Teamwork, action-based learning, and experiential learning</li> </ul>  | Verzat, Byrne, and Fayolle 2009 |
| <ul style="list-style-type: none"> <li>● Action-oriented experiential learning that encourages problem-solving, creativity, and peer evaluation</li> </ul>  | Williams 2015                   |

Table 1: Characterizations of entrepreneurial teaching.

Based on the prior research, there seems to be some consensus that pedagogical approaches that support action-oriented and experiential team learning in authentic learning situations are advocated in entrepreneurship education in order to promote students’ entrepreneurial competences. However, as Klapper and Farber (2016) point out, while experiential learning is slowly becoming the dominant approach in entrepreneurship education, the traditional learning methods still seem to be widely deployed.

The prior research literature (Backström-Widjeskog 2008; Bécharde and Grégoire 2005; Seikkula-Leino et al. 2010) suggests that teachers need more knowledge on the aims of entrepreneurship education and appropriate teaching methods. Peltonen (2015, 508) points out that “adopting entrepreneurial competences does not happen automatically simply by grouping teachers together and increasing their theoretical and practical knowledge of entrepreneurship education.” Peltonen (2015, 2008) stresses the significance of affective and conative aspects of competence, particularly teachers’ self-belief regarding the adoption of new teaching practices.

### Teaching Practices in Entrepreneurship (TPEs)

Understandably, teachers’ perceptions and attitudes have key roles, which can be seen in the or practices they utilize (Birdthistle, Hynes, and Fleming 2007; Bennett 2006). However, the variation in methods used in teaching entrepreneurship is wide. Based on the idea of social constructivism (Higgins and Elliot 2011; Garnett 2012), the key is the teacher’s role as a facilitator and the learners’ active role, where students’ interaction, joint projects, and collaboration are crucial elements of teaching and learning (Jones and Matlay 2011).

There is still no consensus about which methods are most effective in teaching entrepreneurship (Fayolle 2013). However, there are certain methods that seem to gain ground as good practices or as the most used ones. According to Ruskovaara and Pihkala (2013, 2014) and Cheng, Chan, and Mahmood (2009), teachers choose fairly passive methods in their teaching practices, and real-life experiences are seldom brought to classrooms. Furthermore, according to Ruskovaara’s (2014) study, teachers prefer to use methods that are easy to implement in traditional classrooms. Therefore, for example, discussions concerning entrepreneurship are widely used. Such short-term practices, which do not need long planning and organization, are understandably popular among teachers. However, there are studies highlighting positive effects when long-term, hands-on practices (such as mini-company programs) are used (Birdthistle, Hynes, and Fleming 2007; Hytti and O’Gorman 2004).

According to Mwasalwiba (2010), lectures, case studies, discussions, group work, and business simulations are the most often used teaching methods in entrepreneurship, whereas study visits, presentations, workshops, games and competitions, and setting up real ventures are less frequently used. Cheng, Chan, and Mahmood (2009) had similar findings: lectures dominate in teaching methods, whereas business simulations, case studies, role plays, interviewing entrepreneurs, and inviting guest speakers run far behind.

### **University–Business Collaboration (UBC)**

The multifaceted nature of university–business collaboration can be seen in different definitions of this phenomenon. Terms like university–business collaboration and university–industry collaboration have been used. Basically, these both refer to any type of cooperation between universities, their researchers, teachers, students and staff, and companies in order to jointly develop new goods or services or improve existing performance (e.g., Farinha, Ferreira, Smith, and Bagchi-Sen 2015). These definitions highlight the importance of cooperation in developing competitive advantage and innovativeness to access economic growth through collaboration (Pieskä 2012; Lind, Styhre, and Aaboen 2013; Bishop, D’Este, and Neelyc 2011), new knowledge creation, and commercialization (Perkmann et al. 2013; Moilanen, Halla, and Alin 2015)

University–business collaboration is connected to research centers (e.g., Lind, Styhre, and Aaboen 2013). Bravenboer (2018) views the university as part of a supply chain. Pieskä (2012) highlights the collaborative applied research projects as enhancing business opportunities of small and medium-sized enterprises (SMEs). Universities can also be seen as an integral part of the skills and innovation supply chain for business (Bravenboer 2018; Wilson 2012). Meaningful collaboration also needs to include a two-way flow of knowledge, as both parties can be interested in each other’s knowledge (Moilanen, Halla, and Alin 2015; Meyer-Krahmer and Schmoch 1998).

Cooperating and developing cooperation with local businesses is one important element in entrepreneurship education practices in higher education in Finland, especially in the universities of applied sciences. According to Arene (2017), approximately 7,210 companies collaborated with universities of applied sciences in Research, Development, and Innovation activities in 2015. In that collaboration, they created 624 new products or services, 488 new operating concepts, and 233 new tools.

Enhancing the cooperation between educational organizations and local businesses benefits both partners (Lindh and Thorgren 2016; Walter and Dohse 2012; Leitch, Hazlett, and Pittaway 2012). Typically, the businesses in the vicinity of universities of applied sciences are SMEs, and in many cases micro-enterprises (Jokela, Niinikoski, and Muhos 2016). The authentic model of organizing teaching with cooperation has a positive impact on the whole region. The process itself enhances the entrepreneurial mindset and entrepreneurial activity among teachers, too. Cooperation practices vary, depending on teachers’ capabilities, motivation, and local culture. The methods of implementing cooperation are several, ranging from company visits to development projects with local businesses.

Recommendations for integrating entrepreneurship into curricula are built on the idea that entrepreneurship education involves partnership with practicing entrepreneurs. Students need to have opportunities to learn in authentic contexts beyond classrooms (Pittaway and Cope 2007; European Commission 2013). The role of local businesses in education has been discussed in the literature on regional development and entrepreneurship education policy. Local context plays a significant role in how entrepreneurship education is implemented (Lindh and Thorgren 2016; Leitch, Hazlett, and Pittaway 2012). According to Lindh (2017), locally implemented practices of cooperation help entrepreneurship education to fit both local culture and business needs. Ties to local business activate



mechanisms that lead to embedding students in the current entrepreneurial culture (Asheim, Boschma, and Cooke 2011; Lindh 2017).

Four building blocks of entrepreneurship education have been identified, based on documents from 1989–2015 (Lindh and Thorgren 2016). Local entrepreneurial culture is at the center of these building blocks. The four blocks are as follow: involving local businesses in education, preparing students for future business life, locating education in local businesses, and the stimulation of students in order to strengthen existing businesses.

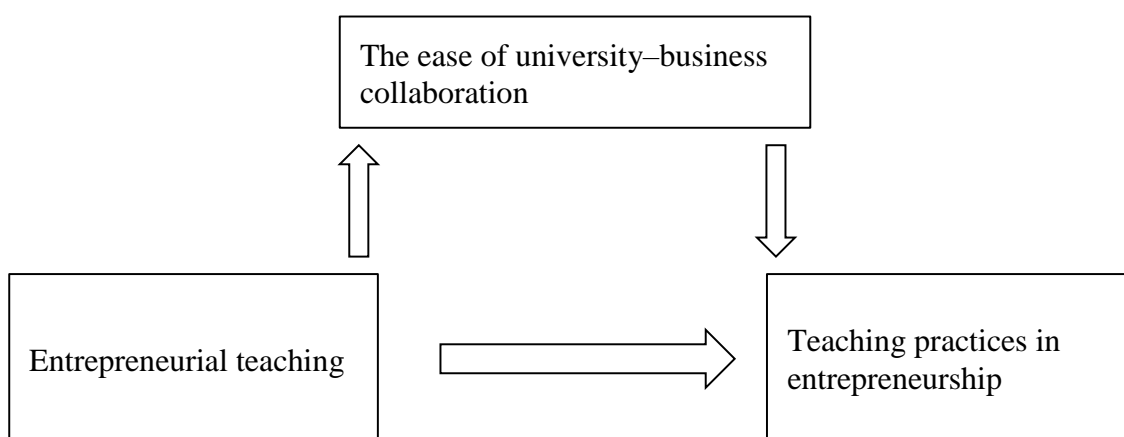
In general, entrepreneurship education and pedagogical choices require learning arrangements that enable holistic, dynamic, active, creative, free, and responsible learning in all dimensions of entrepreneurship. For example, according to Pittaway and Cope (2007), there is a need to develop and introduce new, wider learning environments. Learning is a diversified, complicated, action-based process in many different learning environments, including informal environments (Fiet 2000). From the pedagogical point of view, cooperation with local companies means learning by doing. The core of entrepreneurial pedagogy can be seen in learning by doing and action-based teaching methods (Hägg and Peltonen 2014; Pfeffer and Fong 2002; Gibb 2009). The teacher's role is coaching and enabling the students' learning. Authentic learning is realized in cooperation between learner, task, and environment (Barab, Squire, and Dueber 2000; Herrington and Oliver 2000).

The ease of performing university–business collaboration can vary between teachers. For some teachers, it is much easier to actively increase the number of business contacts and to start cooperation with different companies. The ease of performing such collaboration can have some meaning for the process wherein the teacher decides which teaching methods to use in EE. For example, Fiet (2000) argues that teachers rely on lecture-based methods because these methods are easy to perform and require less investment. If university–business collaboration is easy for the teacher, methods that require authentic business environments are also easier to arrange. Also, implementing EE differs based on local entrepreneurial culture (see, e.g., Huggins and Thompson 2014; Lindh and Thorgren 2016), and this might be connected to teachers' willingness and motivation to collaborate with local businesses.

Hence, based on the previous literature of entrepreneurial teaching and teaching practices in entrepreneurship, we propose the following hypothesis:

*Teachers' perceptions of entrepreneurial teaching have an effect on the teaching practices they adopt in EE.*

The perceived ease of university–business collaboration is added to the model as a control variable. Figure 1 presents the conceptual model for the study.



**Figure 1. The conceptual model.**

### 3. Research Design and Method

The data for this study come from Finland; they have been collected via the Measurement tool for teachers' entrepreneurship Internet survey. The Measurement tool for teachers' entrepreneurship is a self-evaluation tool for teachers, principals, and research and development staff working at universities of applied science. Using the tool, respondents answer anonymously and voluntarily. The tool is publicly available (in Finnish) for anyone ([www.lut.fi/yrittajyysmittaristo](http://www.lut.fi/yrittajyysmittaristo)).

The tool is designed to measure respondents' entrepreneurship operations in schools. The survey asks the respondents what they do when they are teaching and promoting entrepreneurship. After answering the survey, the respondent gets personal feedback, which can be utilized in developing the respondent's actions as a promoter of entrepreneurship.

For the present study, we use data that have been saved in the database during 2014–2017. The questionnaire has 72 questions; however, in this study, we focus on 14 items from the survey. The scale for each of the 14 items was a five-scale Likert scale, where 1 equals *I totally disagree* and 5 equals *I totally agree*.

The study contains a total of 706 respondents from 21 different universities of applied science. That represents 7.54 percent of personnel working at participating universities of applied science (Education Statistics Finland 2018). Of the respondents, 27 percent worked in social sciences, business, and administration, 27 percent in engineering and transport, and 20 percent in social care, health care, and sports. Less than 10 percent of the respondents worked in other fields. Table 2 presents the background characteristics of the respondents.

| Respondents ( <i>n</i> = 706)   | <i>n</i> | %    |
|---|----------|------|
| Gender  |          |      |
| Female  | 411      | 58.2 |
| Male  | 295      | 41.8 |
| Fields of study   |          |      |
| Social sciences, business, and administration                               | 197      | 27.9 |
| Civil engineering and transportation  | 175      | 24.8 |
| Social sciences, health, and sports   | 111      | 15.7 |
| Humanities and education  | 93       | 13.2 |
| Natural sciences  | 50       | 7.1  |
| Arts and culture  | 36       | 5.1  |
| Natural resources and environmental sciences                                | 32       | 4.5  |
| Tourism, nutrition, and economics   | 10       | 1.4  |
| Military sciences and defense   | 2        | 0.3  |
| Has the respondent worked in business beyond her or his educational career? |          |      |
| No  | 654      | 92.6 |
| Yes   | 52       | 7.4  |
| Was the respondent an entrepreneur before his or her educational career?    |          |      |

|  |     |      |
|--|-----|------|
| <i>No</i>  | 462 | 65.4 |
| <i>Yes</i>   | 244 | 34.6 |
| Does the respondent have a career as an entrepreneur as well as his or her educational career? |     |      |
| <i>No</i>  | 556 | 78.8 |
| <i>Yes</i>   | 150 | 21.2 |
| Has the respondent participated in training related to entrepreneurship?                       |     |      |
| <i>No</i>  | 310 | 43.9 |
| <i>Yes, 1–3 times</i>  | 279 | 39.5 |
| <i>Yes, more than 3 times</i>  | 117 | 16.6 |

Table 2. The background characteristics of the respondents.

### Measurement Constructs

We were inspired by the aforementioned studies and, based on them, started to create the tool for teachers. The research-based items were first created by researchers, then tested by pilot teachers, and—based on the valuable feedback—some wording was changed in order to be more understandable to the users. Next, the tested items and scales were coded into the database, which was later created into an interactive tool for teachers.

Some of the items were created in a straightforward process, based on the earlier studies. However, most of the items were inspired by the earlier literature, but modified to capture the teachers' point of view.

In this study, we focus on the themes of *entrepreneurial teaching*, *teaching practices in entrepreneurship*, and *teachers' ease in performing university–business collaboration*. These three themes are measured with fifteen items, created and inspired by the earlier described studies. In the following, we present the theoretical framework guiding the selection of the items. The items are presented in detail in Appendix 1.

#### *Entrepreneurial teaching (ET)*

*Entrepreneurial teaching* was measured with five items. Perspectives of entrepreneurial teaching included:

- trying out new methods (Sánchez 2011; Murnieks 2007; Fisher, Graham, and Compeau 2008),
- easiness of generating new ideas (Krueger 2005; Murnieks 2007),
- problem-solving (Krueger 2005; Murnieks 2007),
- questioning customary ways of doing things (Peltonen 2014; Fisher, Graham, and Compeau 2008), and
- creativity in doing things better (Peltonen 2014).

#### *Teaching practices in entrepreneurship (TPEs)*

*Teaching practices in entrepreneurship* were measured with the seven items. These items included:

- perspectives of utilizing events and competitions promoting entrepreneurship (Blenker, Korsgaard, Neergaard, and Thrane 2011; Gibb 2002; Holmgren and From 2005; Lüthje and Franke 2003; Hytti and O'Gorman 2004),

- utilizing enterprises, entrepreneurs, and their stories (Fletcher 2007; Gartner 2008; Shepherd 2004; Pittaway and Hannon 2008; Solomon 2007; Henderson and Robertson 2000; Pittaway and Cope 2007; Cooper, Bottomley, and Gordon 2004),
- utilizing entrepreneurship during internships (Peltonen 2015; Gibb 1996; Todorovic 2004),
- using methods that simulate business activities (Jones 2007; Löbner 2006; Neck, and Greene 2011; Pihkala 2008; Blenker et al. 2011; Gibb 1996; Liñán, Rodríguez-Cohard, and Rueda-Cantuche 2011; Todorovic 2004),
- using cooperatives or team enterprises (Gibb 1996; Todorovic 2004),
- using entrepreneurship in assessment (Peltonen 2014; Ruskovaara 2014), and
- assessing teacher's own progress as a promoter of entrepreneurship (Peltonen 2014; Ruskovaara 2014).

#### *Ease of performing university–business collaboration (UBC)*

The ease of performing *university–business collaboration* was measured with three items. The perspectives of UBC included:

- activity in increasing business contacts (Peltonen 2014; Ruskovaara and Pihkala 2014; Jones and Iredale 2010; Solomon 2007),
- easiness of starting cooperation with a company (Jones and Iredale 2010; Fisher, Graham, and Compeau 2008; Solomon 2007), and
- easiness of cooperation with companies (Jones and Iredale 2010; Fisher et al. 2008; Solomon 2007).

## **4. Data Analysis and Results**

### **Unidimensionality and Reliability**

Initial data analysis was conducted using IBM SPSS 22.0 statistics software. First, factor analysis was used to assess the unidimensionality of scales. The suitability of factor analysis was tested with the Kaiser-Meyer-Olkin measure of sampling adequacy. Based on the Kaiser-Meyer-Olkin measure (Kaiser-Meyer-Olkin = 0.89), the sample was large enough for using factor analysis. The normality of scales was tested using both the Kolmogorov-Smirnov and Shapiro-Wilk tests, which showed that all the variables in our model were normally distributed.

Three factors were extracted in the analysis. The three factors accounted for 65 percent of the variance and had an eigenvalue greater than 1.0. Varimax rotation was used to determine the variables within each factor. The communalities and factor loadings after rotation for each variable are presented in Appendix 2. The second item in the scale teaching practices in entrepreneurship (TPE2) had loadings for factors 2 and 3, and it was therefore left out of the final scales.

Factor analysis shows the unidimensionality of the scales entrepreneurial teaching (ET), teaching practices in entrepreneurship (TPEs), and the teachers' ease in performing university-business collaboration (UBC). Cronbach's alpha for ET was .86, for TPE .84, and for UBC .89. Kline (1986) suggests a minimum sample size of 300 for using the coefficient alpha in reliability analysis. Hence, our sample size (706) is sufficient for using the Cronbach's alpha. Nunnally (1978) recommends reliabilities of 0.70 or better. Thus, the three scales had high reliability ratios. Descriptive statistics and the correlation matrix are presented in Table 3:

|        | 1         | 2         | 3         |
|--------|-----------|-----------|-----------|
| 1. ET  | 1         |           |           |
| 2. TPE | .37***    | 1         |           |
| 3. UBC | .52***    | .57***    | 1         |
| Mean   | 4.04      | 2.84      | 3.78      |
| SD     | 0.60      | 0.88      | 0.86      |
| Range  | 1.90–5.00 | 1.00–5.00 | 1.00–5.00 |

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 3. The correlation matrix and descriptive statistics for scales.

### Standard Linear Regression analysis

Standard linear regression analysis was used to estimate the relationships among scales and to test the conceptual model. The dependent variable in the model is formed of the TPEs. Table 4 presents the findings. In Model 1, the independent variable is ET. ET has a significant and direct effect on TPEs ( $\beta$ : .37\*\*\*). The model explains 13 percent of the variance in TPEs. However, in Model 2, the control variable was added to the model, which shows that the effect of ET on TPEs disappears. In Model 2, only UBC has a significant effect on TPEs. Model 2 explains 41 percent of the variance in TPEs. F change is significant.

| <b>Model 1</b> |                |
|----------------|----------------|
| ET             | $\beta$ .37*** |
| Adjusted R2    | .13***         |
| F statistics   | 109.627***     |
| <b>Model 2</b> |                |
| ET             | $\beta$ .05    |
| UBC            | $\beta$ .61*** |
| Adjusted R2    | .41***         |
| F statistics   | 240.957***     |
| F Change       | 322.260***     |

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 4. Linear regression analysis for the scales: dependent variable—TPEs.

The findings of the regression analysis indicate that there might be mediation between the studied variables. Baron and Kenny (1986) have developed a simple technique to test such mediation. This involves a four-step approach in which several regression analyses are conducted and the significance of the coefficients is examined. Steps one to three are done to check that the relationships are significant between the variables, indicating that the mediation is possible. This is done through separate regression analyses, where the first analysis tests the path from ET to TPEs, the second analysis tests the path from ET to UBC, and the last analysis tests the path from UBC to TPEs. All of these should be significant. This was done with the studied variables and the results indicate that all of these paths were significant (ET to TPEs:  $\beta = .37, p < .001$ ; ET to UBC:  $\beta = .52, p < 0.001$ ; and UBC to TPEs:  $\beta = .64, p < .001$ ). This suggests that mediation is likely. The fourth step in the regression analysis was already presented in Table 5. Baron and Kenny (1986) state that if the effect of ET is no longer significant after UBC is controlled for, this supports full mediation. As can be seen from Table 5, the results suggest that ease of UBC fully mediates the effect of ET on TPEs.

The findings indicate that the conceptual model should be adapted. Figure 2 presents the adapted model.

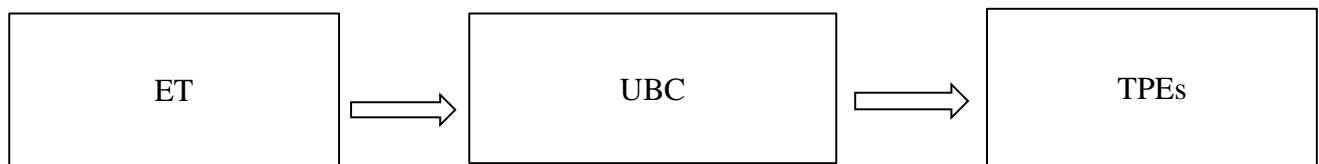


Figure 2. The adapted model, based on the empirical findings.

### Path Analysis

The adapted model was further tested with path analysis using AMOS. The model fit was evaluated as suggested by Byrne (2010): comparative fit index values greater than .90, normal fit index values greater than .95, and root mean square error of approximation values less than .08. In general, a model should contain 10 to 20 times as many observations as variables (Mitchell 1993). Our model has three variables, so the recommendation of Mitchell (1993) is followed. Byrne (2010) also suggests that, for acceptable model fit, a chi-square value with an insignificant result be set at a .05 threshold and  $X^2 / \text{degrees of freedom}$  ratios of less than 3.0.

Model fit measures indicate good fit for the tested model: comparative fit index: .99; normal fit index: .99; root mean square error of approximation: .042;  $X^2 / \text{degrees of freedom}$  ratios: 2.249; a chi-square value with an insignificant result ( $p = .134$ ). Estimates for the model are presented in Table 5.

Table 5. Estimated values, standard errors (S.E.), critical ratios (C.R.), and probability values (P) for the path model.

|     |       | Estimate | S.E. | C.R.   | P   |
|-----|-------|----------|------|--------|-----|
| UBC | ← ET  | .735     | .046 | 16.097 | *** |
| TPE | ← UBC | .651     | .030 | 21.898 | *** |

\*\*\*  $p < .001$

The tested path model with standardized regression weights and squared multiple correlations is presented in Figure 3. Entrepreneurial teaching has a direct and significant effect ( $\beta = .52$ ) on the ease of UBC. It explains 27 percent of the variance in UBC. Ease of UBC also has a direct and significant effect ( $\beta = .64$ ) on the TPEs. The whole model explains 41 percent of the variance in TPEs. The indirect effect of ET on TPEs is .33.

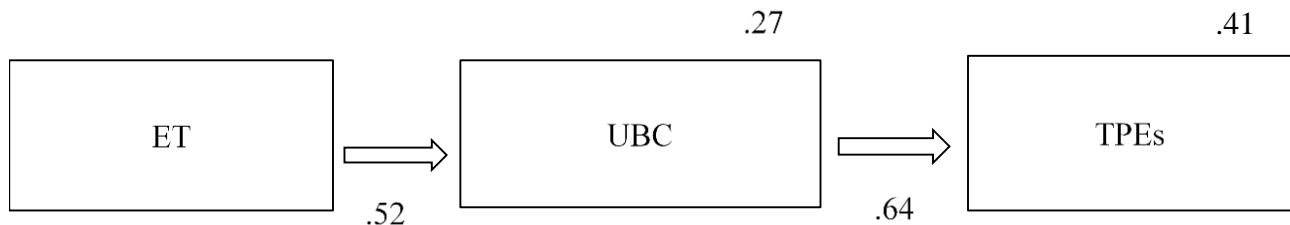


Figure 3. The tested path model with standardized regression weight and squared multiple correlations.

## 5. Discussion

The main objective of this study was to examine the effect of entrepreneurial teaching on the teaching practices in entrepreneurship education. Based on the results, our hypothesis is partly supported. Entrepreneurial teaching has an effect on the teaching practices used, but the effect is indirect and mediated by the teacher's perception of the ease of performing university–business collaboration. It is quite interesting that university–business collaboration has such a central role in the methods used in entrepreneurship education. This indicates that it is important to support teachers in the collaboration in many ways. The teacher's ability to perform entrepreneurial teaching also has a direct effect on the ease of performing university–business collaboration. The greater the ability of the teacher, the easier the university–business collaboration and the use of versatile teaching methods.

Our article contributes to theory in deepening the understanding of entrepreneurship education, and especially how entrepreneurial teaching and university–business collaboration are connected to each other. Lahikainen et al. (2018, Ruskovaara, and Pihkala) have defined such collaboration as a fast track to entrepreneurial learning. Based on our findings, university–business collaboration is not only a handy approach for teachers to put entrepreneurship education into practice, but it also has a crucial role in defining methods used. Furthermore, it is important to understand that entrepreneurial teaching in itself is not enough to affect the methodological choices of the teacher. It also requires the teacher's feeling of ease when cooperating with companies. In teacher education (especially that related to entrepreneurship education), it is important to bring companies into classrooms and cooperate substantially with the local industry. However, there can be many barriers for university–business collaboration relating to connections, funding, organizational culture differences, and internal organizational characteristics (Galán-Muros and Plewa 2016). More studies are needed to understand what the barriers that teachers see as the most important ones in university–business collaboration are and how these barriers could be crossed. Also more research is needed about other factors besides entrepreneurial teaching that affect the perceptions of the ease of university–business collaboration.

Entrepreneurship education is not an isolated phenomenon that is only enhanced by teachers in classrooms. A more holistic approach is needed. University–business collaboration is a part of an entrepreneurship ecosystem in education. For example, Belitski and Heron (2017) propose a framework for the creation of an entrepreneurship education ecosystem as a unit of analysis when considering the role of university–industry–government collaboration. This framework suggests different approaches to teaching, research, and business outreach. The idea of an entrepreneurship education ecosystem should also be emphasized in teacher training and provide knowledge for developing supportive practices. Even though the perspective of an entrepreneurship ecosystem was not examined in this study, in future research the concept should be taken into account. Also, Hynes and Richardson (2007) present challenges for the roles of both educators and educational institutions. There is a need to engage with external stakeholders in higher education program design, which requires commitment from educational institutions and educators in order to change their knowledge and teaching perspective. Entrepreneurship education initiatives should be designed, delivered, and assessed in order to meet the needs of different stakeholders.

Our results highlight the importance of teachers’ networks and especially how crucial it is that teachers perceive the collaboration with companies to be easy. This leads to practical implications that will emerge as challenges and opportunities for universities’ management. For example, teachers should be encouraged to collaborate with companies. This is pretty much a question of leadership and organizational culture. In an innovative organization, the teachers are not afraid of experiments and testing new pedagogical approaches. First of all, these bold experiments should be sufficiently resourced and also rewarded. The top management level of the educational organization is in charge of making the environment suitable for individuals and teachers’ teams to be free to collaborate. This means that the university enables the resources (time) enough for the teachers to become familiar with local businesses to understand their needs. This is a networking process which starts when you first learn to know each other and reliable relations develop step by step. Existing good practices can be used as benchmarking examples.

As the data consist of responses from only one country, it is rather limited. Therefore, the generalizability of the results is restricted, especially in international contexts. Responding to the Measurement tool for teachers’ entrepreneurship questionnaire is voluntary. As this is the case, there is always a possibility that the teachers who are most familiar with or think highly of entrepreneurship are more represented in our data than the ones who are not so involved in entrepreneurship. Should that be the case, it may have led to overly optimistic results. On the other hand, it is also possible that the respondents who are very familiar with entrepreneurship have a more critical view of their involvement in entrepreneurship. As the Measurement tool for teachers’ entrepreneurship questionnaire is based on self-reporting, it may suffer from various biases in the responses. Even though we have not observed biases in the responses, a common method bias is possibly related to expected or socially acceptable answers.

Nevertheless, this study creates new knowledge about entrepreneurship education in the context of Finnish higher education. Thus, it offers suggestions for Finnish policy makers and developers of teacher education. Despite the restrictions of the study, we think that these results may provide useful knowledge for both research and practice because of the current strong interest in supporting entrepreneurship internationally. According to the European Commission (2002), Finland is the first European Union country to embed entrepreneurship education in curricula at all education levels. Furthermore, on a strategic level, entrepreneurship has been promoted in many ways (Lahikainen, Ruskovaara, and Pihkala 2018). Therefore, as Finland is a great example and a progressive pioneer in implementing university–business collaboration in schools, we hope that the results are also of interest to a wider audience.



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## Appendix 1. Items.

ET1: “I dare to try out new working methods, even though I feel success is uncertain.” (Sánchez 2011; Murnieks 2007; Fisher, Graham, and Compeau 2008)

ET2: “It is easy for me to generate new ideas.” (Krueger 2005; Murnieks 2007)

ET3: “I usually find more alternative solutions to problems than others do.” (Krueger 2005; Murnieks 2007)

ET4: “I am capable of questioning customary ways of doing things.” (Peltonen 2014; Fisher, Graham, and Compeau 2008)

ET5: “I tend to seek better ways of doing things.” (Peltonen 2014)

TPE1: “I utilize events and competitions promoting entrepreneurship (e.g., business idea competition) in my teaching.” (Blenker et al. 2011; Gibb 2002; Holmgren and From 2005; Lüthje and Franke 2003; Hytti and O’Gorman 2004)

TPE2: “I utilize enterprises, entrepreneurs, and their stories in my teaching.” (Fletcher 2007; Gartner 2008; Shepherd 2004; Pittaway and Hannon 2008; Solomon 2007; Henderson and Robertson 2000; Pittaway and Cope 2007; Cooper, Bottomley, and Gordon 2004)

TPE3: “I instruct my students to learn about entrepreneurship during internships.” (Peltonen 2015; Gibb 1996; Todorovic 2004)

TPE4: “In my teaching, I use methods that simulate business activities (e.g., business start-up exercises, entrepreneurial games, practice enterprise activities).” (Jones 2007; Löbner 2006; Neck and Greene 2011; Pihkala 2008; Blenker et al. 2011; Gibb 1996; Liñán, Rodríguez-Cohard, and Rueda-Cantuche 2011; Todorovic 2004)

TPE5: “My teaching includes students’ activities in cooperatives or team enterprises.” (Gibb 1996; Todorovic 2004)

TPE6: “Entrepreneurship is included in assessment objectives and/or criteria in my teaching.” (Peltonen 2014; Ruskovaara 2014)

TPE7: “I regularly assess my progress as a promoter of entrepreneurship.” (Peltonen 2014; Ruskovaara 2014)

UBC1: “I actively tend to increase the number of my business contacts.” (Peltonen 2014; Ruskovaara and Pihkala 2014; Jones and Iredale 2010; Solomon 2007)

UBC2: “It is easy for me to start a cooperation with a company.” (Jones and Iredale 2010; Fisher, Graham, and Compeau 2008; Solomon 2007)

UBC3: “It is easy for me to cooperate with companies.” (Jones, and Iredale 2010; Fisher, Graham, and Compeau 2008; Solomon 2007)

Appendix 2. Factor analysis for the scales.

| Variable | Communality | Factor 1 | Factor 2 | Factor 3 |
|----------|-------------|----------|----------|----------|
| ET1      | .45         | .67      |          |          |
| ET2      | .61         | .76      |          |          |
| ET3      | .53         | .70      |          |          |
| ET4      | .58         | .78      |          |          |
| ET5      | .52         | .71      |          |          |
| TPE1     | .47         |          | .66      |          |
| TPE2     | .50         |          | .43      | .49      |
| TPE3     | .35         |          | .55      |          |
| TPE4     | .43         |          | .63      |          |
| TPE5     | .36         |          | .61      |          |
| TPE6     | .54         |          | .75      |          |
| TPE7     | .58         |          | .75      |          |
| UBC1     | .57         |          |          | .63      |
| UBC2     | .77         |          |          | .84      |
| UBC3     | .77         |          |          | .84      |