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Stakeholder collaboration in entrepreneurship education: an analysis of the entrepreneurial ecosystems of European higher educational institutions

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Abstract Stakeholder theory has thus far received limited attention in the context of entrepreneurship education and university management. This paper addresses this research gap by examining the collaboration of stakeholders from the entrepreneurial ecosystem in entrepreneurship education at European higher educational institutions (HEIs). We contribute to existing research by combining literature streams from the fields of entrepreneurship education, entrepreneurial ecosystems and stakeholder theory. Empirical research is based on a cross-case analysis of 20 HEIs from 19 different European countries. Data sources include next to secondary data and observation a total 216 interviews with entrepreneurship education stakeholders at these 20 HEIs. The results of the case studies are further validated through an independent peer group and through 14 interviews with international experts in entrepreneurship education. Based on this data, an overview of the key external stakeholder groups of the entrepreneurial ecosystem of HEIs and their forms of involvement in entrepreneurship education is provided. Furthermore, the strength and coordination of stakeholder collaboration and the overall approaches to stakeholder management are discussed. This analysis results in the development of a set of propositions on stakeholder involvement in the context of entrepreneurship education at HEIs. The findings of this paper highlight the importance of stakeholder collaboration from the

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entrepreneurial ecosystem at HEIs. Implications of the findings for entrepreneurship educators and university management are ultimately discussed along with suggestions for further research.

Keywords Entrepreneurship · Entrepreneurship education · Higher educational institutions · Stakeholder involvement · Stakeholder collaboration · Entrepreneurial ecosystem

JEL Classification A20 · I23 · M13 · O30

1 Introduction

Recent literature has identified the key role played by entrepreneurship in the process of technology transfer (Sandström et al. 2016; Drivas et al. 2016). Entrepreneurship education may be a key instrument used to enhance entrepreneurial activity, which in turn serves as a spur for technology transfer.

Entrepreneurship education encompasses *any pedagogical [program] or process of education for entrepreneurial attitudes and skills* (Fayolle et al. 2006, p. 702). The importance of entrepreneurship education for new venture creation and for establishing entrepreneurial skills and strengthening entrepreneurial intentions has been emphasized by prior research in the field (e.g. Von Graevenitz et al. 2010; Martin et al. 2013; Bae et al. 2014). As a result, governments across the globe have increased their support for entrepreneurship education and a magnitude of new centres, departments and institutes dedicated to entrepreneurship have been established at higher educational institutions (HEIs) (Kuratko 2005; Volkmann et al. 2009; Von Graevenitz et al. 2010; O'Connor 2013). The challenge remains for HEIs to move from educating about entrepreneurship to also focus on educating for entrepreneurship (Kirby 2004). To facilitate the process of university entrepreneurship and new venture creation by students and alumni, HEIs frequently engage in collaboration with stakeholders and actors from the entrepreneurial ecosystem (Streeter et al. 2002; Kuratko 2005; Motoyama and Watkins 2014).

Entrepreneurial ecosystem theory has become an expanding research area within the field of entrepreneurship (e.g. Van de Ven 1993; Lorne 2009; Isenberg 2010, 2011; Zahra and Nambisan 2011; Suresh and Ramraj 2012; Nambisan and Baron 2013; Clarysse et al. 2014; Motoyama et al. 2014). Volkmann et al. (2009, p. 12) have stressed the need to *create the types of environments that are conducive to encouraging entrepreneurial ways of thinking and behaving*. HEIs that engage in entrepreneurship education represent a key component of the entrepreneurial ecosystem (e.g. Cohen 2006; Isenberg 2010, 2011). As a result, the concept of the university entrepreneurial ecosystem has emerged in the literature (e.g. Kumaraswamy et al. 2008; Boh et al. 2012; Cheng 2012). In similar terms, university support for entrepreneurial ecosystems and the creation of an entrepreneurial regional culture has been subject of analysis in prior research (e.g. Feldman 2001; Coduras et al. 2008; Pitelis 2012; Suresh and Ramraj 2012; Clarysse et al. 2014).

A related concept of high importance with regard to entrepreneurial ecosystems is stakeholder theory. Stakeholder theory is foremost employed in a business context being defined as *those groups and individuals who can affect or be affected* by business activities (Freeman 1984, p. 25; see also Freeman 2010, p. 9). Concerning the particular context of entrepreneurship education, stakeholders consequently encompass all groups that are

directly or indirectly affected by entrepreneurship education either through active involvement in the provision of education or by being recipients of education. Whereas internal stakeholders relate to university affiliates, including university management and instructors, external stakeholders contain all non-university stakeholders that are directly involved in or related to entrepreneurship education of the respective universities. Such external stakeholder groups include enterprises, financial institutions, support services, incubators, accelerators, as well as science and technology parks and partner universities (Amaral and Magalhaes 2002; Bartell 2003).

While prior research in the respective fields of entrepreneurship education, entrepreneurial ecosystems and stakeholder theory has been rather extensive, little overlap between these three research areas can be observed (Motoyama and Watkins 2014). Entrepreneurship education itself is a relatively well-established researched area with a variety of conceptual and empirical research studies being conducted (e.g. Garavan and O'Cinneide 1994; Streeter et al. 2002; Kirby 2004; Kuratko 2005; Van Dorp 2009; Volkmann et al. 2009; Bae et al. 2014). With the emergence of the concept of university entrepreneurial ecosystems, initial analyses of the components of ecosystems of HEIs have taken place (e.g. Kumaraswamy et al. 2008; Boh et al. 2012; Cheng 2012). Past research has also inertly began to identify the internal and external stakeholders of HEIs (e.g. Amaral and Magalhaes 2002; Bartell 2003; Volkmann et al. 2009). Yet little examination of the stakeholder relationships of the entrepreneurial ecosystem at HEIs has taken place thus far. Matlay (2009) explicitly states that *[…] there exists a paucity of research on stakeholder impact on entrepreneurship education (p. 356)* with *[…] only a limited number of empirically rigorous studies dedicated to a stakeholder approach to entrepreneurship education or aimed specifically at this neglected aspect of educational research (p. 357).*

To address this research gap, the paper at hand aims at examining the involvement of external stakeholders from the entrepreneurial ecosystem in entrepreneurship education. The stakeholder collaboration within the entrepreneurial ecosystem will thereby be analysed from the perspective of HEIs in Europe. The following research questions are examined:

- Who are the key external stakeholder groups from the entrepreneurial ecosystem that engage in entrepreneurship education at HEIs?
- What are the forms of stakeholder involvement in entrepreneurship education at HEIs?
- How does the involvement in entrepreneurship education vary per stakeholder group and per HEIs?
- How strong is the overall stakeholder collaboration in entrepreneurship education at European HEIs?
- How formalized is the overall stakeholder coordination in entrepreneurship education at European HEIs?
- Which implications can overall be drawn for stakeholder management at HEIs in the context of entrepreneurship education?

The empirical research is based on an exploratory cross-case analysis of 20 case studies on European HEIs. Collected data include secondary data from scientific publications and information material from each of the HEIs. Moreover, primary data was collected on side at each of the HEIs through observation next to 216 semi-structured interviews with internal and external stakeholders. Findings from the individual case studies and the cross-case analysis were externally validated through a peer group and through 14 semi-structured interviews with experts in the field of entrepreneurship education.

The findings of this paper provide important contributions to theory and practice. First, the literature review merges three different research fields which have been examined mostly separately in past studies, namely entrepreneurship education, entrepreneurial ecosystems and stakeholder theory. Second, as a result of an empirical cross-case analysis of the entrepreneurship education approaches of 20 HEIs, an overview is provided which reveals the forms of involvement and types of collaboration of the distinct stakeholder groups of the entrepreneurial ecosystem. On the basis of this analysis a set of propositions is derived on stakeholder collaboration in entrepreneurship education at HEIs. These findings lead to important implications for university management, policy makers and researchers concerning the management of stakeholders and development of entrepreneurial ecosystems at HEIs.

This paper is structured as follows. Following the introduction, a literature review is conducted on entrepreneurship education, stakeholder theory and entrepreneurial ecosystems by focusing on HEIs. Next, a methods section describes the empirical research methodology of this study. This is followed by a findings section where the results of the empirical research on stakeholder collaboration at HEIs in the context of entrepreneurship education are described and discussed. This section ends with the development of a set of propositions. The findings and implications are ultimately discussed and limitations and suggestions for further research are stated.

2 Literature review

2.1 Entrepreneurship education

Entrepreneurship education relates to the practice of teaching entrepreneurship either in a curricular or extra-curricular manner. Hereby, the focus is set on higher education with entrepreneurship education being provided by HEIs. We thereby employ a broader view of entrepreneurship education by not solely aiming at new venture creation but also at *the development of entrepreneurial attitudes and skills as well as personal qualities* (Fayolle and Gailly 2008, p. 572). In accordance to Fayolle et al. (2006, p. 702) entrepreneurship education programmes can thus be described as *any pedagogical [program] or process of education for entrepreneurial attitudes and skills*. Concerning the nurture versus nature debate, several researchers have come to the conclusion that entrepreneurship can be taught (e.g. Kuratko 2005; Drucker 1985; Gorman et al. 1997). While the importance of entrepreneurship education is widely recognized uncertainty remains on how entrepreneurship education can best be taught in pedagogical terms (Kuratko 2005; Streeter et al. 2002).

Past research has documented the substantial growth of entrepreneurship education programs over the past two decades (e.g. Streeter et al. 2002; Kuratko 2005; Martin et al. 2013; Rauch and Hulsink 2015). In 2005, there have already been over 1600 entrepreneurship courses been offered at colleges and universities (Kuratko 2005). Entrepreneurship education can be offered in a variety of ways by distinguishing between a focused and a university-wide approach on the one hand and on the other hand between a magnet approach—centralized from the business schools—and a radiant approach—decentralized from outside the business schools (Streeter et al. 2002). Hereby, a trend can be observed towards university-wide, magnet entrepreneurship education programs (Streeter et al. 2002).

As a relatively novel field, research on the evaluation and effectiveness of entrepreneurship education has not yet painted a clear picture by revealing contradicting results (Fayolle and Gailly 2008; Martin et al. 2013; Nabi et al. 2016; Rauch and Hulsink 2015; O'Connor 2013; von Graevenitz et al. 2010). Past research has indicated that entrepreneurship education can positively influence entrepreneurial awareness (Gorman et al. 1997), entrepreneurial intentions (Fayolle et al. 2006), entrepreneurial aptitude (von Graevenitz et al. 2010), entrepreneurial behavior (Dickson and Solomon 2008) and entrepreneurial success (Robinson and Sexton 1994). Further research has revealed a positive influence of entrepreneurship education on entrepreneurial perceptions caused by increased self-efficacy (Peterman and Kennedy 2003). Tangible benefits of entrepreneurship in turn include economic growth, employment creation, technological innovation, knowledge spillover, enhanced productivity and resource efficiencies (Audretsch and Fritsch 2002; Kuratko 2005; O'Connor 2013; Plaschka and Welsch 1990). Those economic benefits of entrepreneurial activities may serve as an explanation for the increased interest in entrepreneurship education (Matlay 2009). Nonetheless, empirical results on the relationship between entrepreneurship education and entrepreneurial outcomes are mixed, partially contradicting and at times even negative or insignificant (Charney and Libecap 2003; Matlay 2009; Oosterbeek et al. 2010).

One concept that has recently gained increased prominence in the context of entrepreneurship and HEIs is the notion of an entrepreneurial university. Hereby, the focus is shifted from traditional teaching and research universities to entrepreneurial universities (Etzkowitz 2004). At an entrepreneurial university research and teaching results should be translated into entrepreneurial activity (Etzkowitz 2003). Entrepreneurial outcomes are thereby generally desired by university management being either explicitly or implicitly addressed through university-wide strategic goals (Gibb and Hannon 2006). A university can consequently function as incubator for innovations (Etzkowitz 2003). Initial research has examined the idea of the entrepreneurial university by focusing on relationships with a university's environment in form of networks and interactions with start-ups, large companies or governments and thereby indirectly touching upon stakeholder theory, support and collaboration in entrepreneurial undertakings of universities (Etzkowitz 2003, 2004; Gibb and Hannon 2006; Herrera 2001). Hence, research on entrepreneurial universities represents an emerging research stream where the concepts of entrepreneurship, education at HEIs and stakeholder theory are peripherally interlinked.

2.2 Stakeholder theory

Stakeholder theory has gained prominence due to the work of Edward Freeman (1984, 1994, 2010). The underlying notion evolved as an altering view to Friedman's shareholder view of a firm which emphasized financial wealth creation for shareholders as primary purpose of a company. In contrast, stakeholder theory states that companies do not solely need to satisfy their shareholders but should address the needs and interests of all their key stakeholder groups (Freeman 1994; Laplume et al. 2008). Freeman (1984, p. 46) defines stakeholders as […] *any group or individual who can affect or is affected by the achievement of the organization's objectives.*

Responding to these stakeholder interests might oftentimes involve a trade-off due to conflicting concerns and needs between and among different stakeholder groups (Chandler and Werther 2014). Stakeholders can influence the operations of a business in a positive or negative manner (Sachs et al. 2002). Stakeholder support and cooperation should generally be preferred over stakeholder conflict to maximize the positive stakeholder contribution

and to minimize the possible harm (Freeman 1984). Stakeholder theory explicitly points out the crucial role of stakeholder support for firm success since *without the support of these key groups the firm does not survive* (Freeman 1984, p. 33). Stakeholder theory further stresses the importance of collaboration and partnership between all key stakeholder groups (Freeman 1984; Freeman et al. 2014). Stakeholder engagement implies involving stakeholders into the process of organizational decision making to consider and balance their interests (Chandler and Werther 2014; Edelenbos and Klijn 2006; Hillman and Keim 2001).

Stakeholder theory draws on the notion of systems theory by assuming that organizations are embedded in their environment and should not be investigated in isolation. Systems theory highlights the interconnectedness of actors in a system and while stressing the importance of interaction and collaboration of actors within a system (Freeman 1984). This is similar to the concept of entrepreneurial ecosystems, outlined below, in which a systemic perspective is employed as unit of analysis on enterprises and their interactions with actors of the entrepreneurial ecosystem.

The concept of stakeholder theory has been mostly employed in strategic management and business ethics literature with a *disproportionate amount of research focusing on large publicly traded corporations* (Laplume et al. 2008, p. 1172). In contrast, limited stakeholder theory research on other organizational types, such as small and medium enterprises, family firms, non-profit organizations or governmental organizations can be observed (Laplume et al. 2008, p. 1174). The amount of studies that focus explicitly on stakeholder theory in the context of HEIs per se is very limited. In the conceptualization of the authors, stakeholders in entrepreneurship education encompass all groups that are directly or indirectly affected by entrepreneurship education either through active involvement in the provision of education or by being recipients of education. External stakeholders in this respect contain all non-university stakeholders that are directly involved in or related to entrepreneurship education of the respective universities (Amaral and Magalhaes 2002; Bartell 2003). All those stakeholder groups can be considered interconnected actors of the entrepreneurial ecosystem.

2.3 Entrepreneurial ecosystems

Entrepreneurial ecosystems are characterized by a high capacity and willingness to innovate (Zahra and Nambisan 2011) and can be defined as:

> […] a diverse set of inter-dependent actors within a geographic region that influence the formation and eventual trajectory of the entire group of actors and potentially the economy as a whole [which] evolve through a set of interdependent components which interact to generate new venture creation over time (Cohen 2006, pp. 2–3).

Although publications in the area of entrepreneurial ecosystems have increased in the past decade, Simatupang et al. (2015) argue that the entrepreneurial ecosystems literature is yet underdeveloped and in need for further theory development. The entrepreneurial ecosystems literature derives out of the environmental approach to entrepreneurship (Bloodgood et al. 1995; Mason and Brown 2014). In this conceptualization, interactions with the external environment can determine the success of an enterprise where […] *A favorable external environment, however, will ease such barriers and encourage entrepreneurial potential* (Lee and Peterson 2001, p. 407). Hence, a supportive entrepreneurial ecosystem can foster, via stakeholder collaboration, entrepreneurial

activities that can in turn generate regional economic development, innovation, prosperity and wealth generation (Motoyama and Watkins 2014; Simatupang et al. 2015; Suresh and Ramraj 2012).

The notion of an entrepreneurial ecosystem implies the social embeddedness of entrepreneurs in their environments and the integration into their respective local structures (Jack and Anderson 2002). Entrepreneurship can be described as a local phenomenon (e.g. Audretsch et al. 2012; Feldman 2001; Feldman and Francis 2004) although Motoyama and Watkins (2014) claim that the local system of entrepreneurship remains under-researched. Entrepreneurial ecosystem theory further relates to cluster theory which similarly underlines the importance of a local or regional context for entrepreneurial success (e.g. Cohen 2006; Delgado et al. 2010; Feldman 2001; Johannisson1988; Jungwirth and Müller 2010; Myint et al. 2005; Pitelis 2012; Porter 1998). As mentioned above, the entrepreneurial ecosystems literature draws upon systems theory by examining complex, interconnected systems as well as the (de)configuration and development of these systems (Bertalanffy 1968; Müller 1997). System thinking focuses on the interactions of the components within an entire system and thereby employs a systemic perspective (Mingers and White 2010; Senge 2008; Binkley 2015).

A multitude of past studies have conceptualized entrepreneurial ecosystems (e.g. Cohen 2006; Dziri 2013; Gnyawali and Fogel 1994; Isenberg 2010; 2011; Motoyama and Watkins 2014; Neck et al. 2004; Spilling 1996; Suresh and Ramraj 2012; Volkmann et al. 2012) whereas solely a limited number of these papers have explicitly included HEIs as a component of entrepreneurial ecosystems (e.g. Isenberg 2011; Streeter et al. 2002). As an example, Isenberg (2011) specifically considers educational institutions one domain of the entrepreneurship ecosystem with their role being the provision of *general degrees* and *specific entrepreneurship training* and thereby creates a linkage between entrepreneurial ecosystems and entrepreneurship education:

> Entrepreneurship, to be self-sustaining, requires an ecosystem, and an ecosystem requires proximity so the different domains can evolve together and become mutually reinforcing. Entrepreneurship education can support capital formation, and capital formation can support government reform (Isenberg 2011, p. 11).

A related concept which has been recently established in the context of entrepreneurial ecosystems and HEIs is the university-based entrepreneurial ecosystem which employs the perspective of universities in analyzing entrepreneurial ecosystems. Research in the field is still in a very nascent stage. One of the view empirical studies conducted thus in a comparative study of six university-based entrepreneurial ecosystems in Asia, North America and Europe conducted by Rice et al. (2010). In contrast to our broader view on entrepreneurship education in accordance with Fayolle and Gailly (2008), the conceptualization by Rice et al. (2010) is based on a narrow view of entrepreneurship education with a focus on new venture creation. In this context, a resource-based perspective is employed for developing university-based entrepreneurial ecosystems. The findings highlight that although the concrete strengths and conceptualization of university-based entrepreneurial ecosystems generally vary among universities, a set of common characteristics can be identified. A key success factor for instance is the existence of entrepreneurial leaders such as entrepreneurial champions or entrepreneurial sponsors who push entrepreneurship forward in a university setting in form of a pilot program despite resistance to change and who bundle existing resources. Moreover, faculty and senior leadership and long-term commitment are considered as important for establishing a university-based entrepreneurial ecosystem. Strong university-based entrepreneurial

ecosystems generate benefits in form of the creation of *an extraordinarily resource-rich, comprehensive and dynamic context for delivering entrepreneurship education and for supporting start-up and development of new ventures* (Rice et al. 2010, p. 177). The present research builds upon the notion of a university-based entrepreneurial ecosystem but extends the research of Rice et al. (2010) by a wider understanding of entrepreneurship education and by employing a stakeholder view as opposed to a resource-based view in a European setting.

3 Methods

3.1 Research design

Since research on the stakeholder relationships in the field of entrepreneurship education with regard to HEIs is still in a nascent stage, a qualitative research design was employed in this paper in form of a comparative, multiple case study approach. In accordance to Yin (2013), case studies can serve the purpose of exploration being a suitable strategy when focusing on a contemporary phenomenon in a real-life, contextual setting.

3.2 Sample selection

Within the scope of this study, HEIs were chosen as case study objects on the basis of theoretical sampling in order to *choose cases which are likely to replicate or extend the emergent theory* (Eisenhardt 1989, p. 537). Based on the criteria specified by Seawright and Gerring (2008), the selected cases shall be typical, diverse, extreme, deviant and influential. These criteria formed the basis for the subsequent case selection process which was conducted in cooperation with the European Commission and a panel of four international entrepreneurship education experts. In total, 20 different HEIs from 19 European countries were selected as case studies.[1]

3.3 Data collection

For each of the selected 20 HEIs a qualitative case study was conducted on the basis of an overarching case study template. A distinguishing characteristic of a qualitative case study methodology is the fact that it *provides tools for researchers to study complex phenomena within their contexts […] using a variety of data sources […] which allows for multiple facets of the phenomenon to be revealed and understood* (Baxter and Jack 2008, p. 544).

Collected data included secondary data from scientific publications and information material from the HEIs. Moreover, primary data was gathered on side at each of the HEIs through observation next to semi-structured interviews with internal and external stakeholders of entrepreneurship education, such as university management, professors, instructors, students, mentors, consultants, experts or entrepreneurs. In total 216 interviews

[1] The 20 selected cases encompass the following HEIs: Bucharest University of Economic Studies, Cambridge University, University of Coimbra, Dublin City University, University of Huddersfield, Kaunas University of Technology, Technical University Kosice, Kozminski University, University of Liège, University of Linz, University of Ljubljana, University of Lüneburg, University of Lund, EMLYON, Milan Politechnic University, University of Osijek, Erasmus University Rotterdam, University of Southern Denmark, Tampere University of Applied Sciences and University of Valencia.

were conducted for the 20 case studies. A gatekeeper from each HEI served as contact person and as internal validator of the content of each of the case studies.

3.4 Data analysis

In order to jointly analyse the examined 20 HEIs, an exploratory cross-case analysis of all 20 case studies was conducted on the basis of a context analysis (Eisenhardt 1989; Krippendorff 2012). A qualitative data analysis facilitates the inquisition of an interviewee's perspective, an interpretative analysis of the information and the creation of generalizations in a theoretical sense (Flick 2015). Next to a qualitative description, results of a content analysis can according to Pistrang and Barker (2012) further be displayed in a quantitative manner through frequency counts per content category in order to provide a comprehensive, systematic overview of the key findings. The findings of this cross-case analysis were validated through an external peer group and through 14 semi-structured interviews with experts in the field of entrepreneurship education.

4 Findings

The findings of the research identify 12 key external stakeholder groups of entrepreneurship education at HEIs. Below, general observations are described and the overall strength and coordination of stakeholder collaboration is discussed. Moreover, an overview of the forms of involvement per stakeholder group is provided next to a discussion of the overall approach to stakeholder management in the context of entrepreneurship education at HEIs. Afterwards additional findings from the expert interviews are presented. Based on the proceeding analysis, a set of six propositions on stakeholder collaboration in entrepreneurship education at HEIs are ultimately developed and the overall findings are discussed.

4.1 General observations

The results indicate the importance of stakeholder involvement from the entrepreneurial ecosystem into entrepreneurship education at HEIs. All 20 examined case universities engage in forms of collaboration with external stakeholders. The extent of those relationships and the forms of involvement by the respective stakeholder groups varies among the cases. Involvement of external stakeholders may be in curricular entrepreneurship education activities, in extra-curricular entrepreneurship education activities or in both. 12 key external stakeholder groups in the context of entrepreneurship education at HEIs can be identified (see Fig. 1), namely entrepreneurs (ENT); companies (COM); financial institutions (FI); support service providers (SSP); incubators and accelerators (IA); student organizations (SO); alumni (AL); higher educational institutions (HEI); science and technology parks (STP); governmental organizations (GO); non-governmental organizations (NGO); and other organizations (OO).

Table 1 of the Appendix displays the stakeholder involvement in entrepreneurship education at the 20 HEIs per stakeholder group. The number of stakeholder groups that are involved in entrepreneurship per HEI range from three to ten stakeholder groups with an average of six to seven collaboration partners. Nonetheless, the number of stakeholder

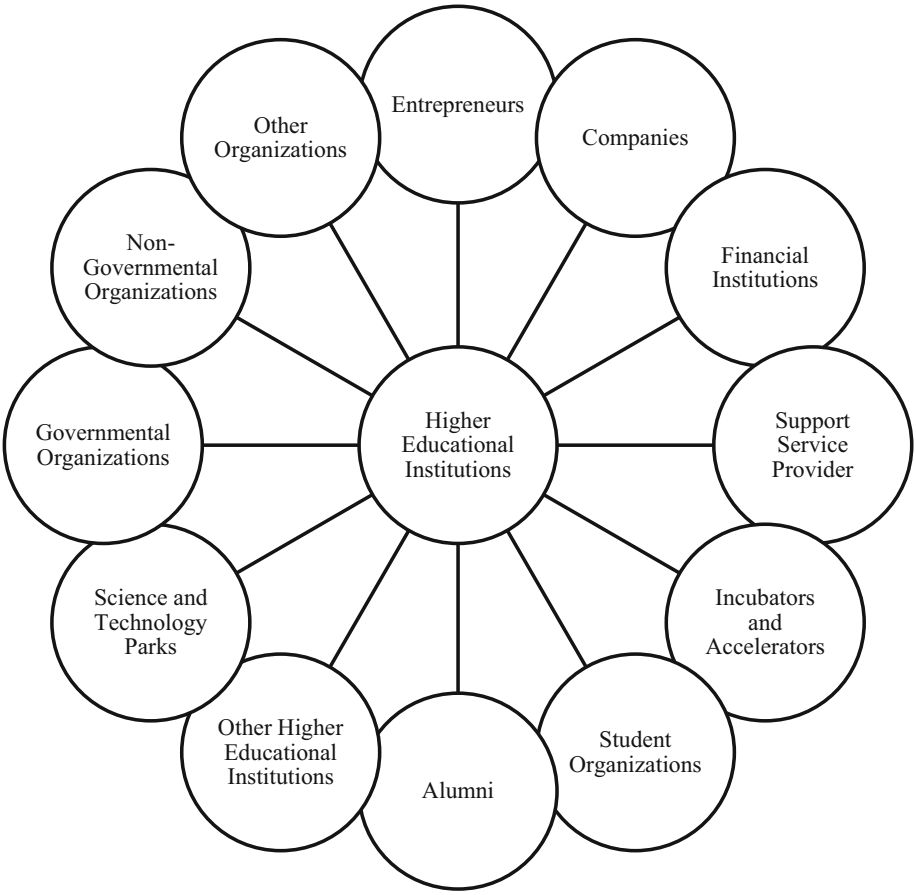

Fig. 1 External stakeholder groups of entrepreneurship education at higher educational institutions

partnerships does not provide any information about the intensity of the specific partnerships. As an example, the HEI that possesses solely stakeholder collaboration in entrepreneurship education with three stakeholder group simultaneously emphasises its strong, long-term and in-depth connection with those three groups. The most common stakeholder involvements overall include partnerships with entrepreneurs and companies. Frequent collaboration further takes place with alumni, other HEIs, science and technology parks next to incubators and accelerators and governmental organizations. Less than half of the 20 HEIs report about cooperation with financial institutions, support service providers and other organizations. The least frequent collaboration partners in entrepreneurship education are ultimately student organizations and non-governmental organizations.

4.2 Strength of stakeholder collaboration

With regard to the strength of stakeholder collaboration, two HEIs possess a weak approach, eight HEIs a moderate approach and ten HEIs follow strong stakeholder

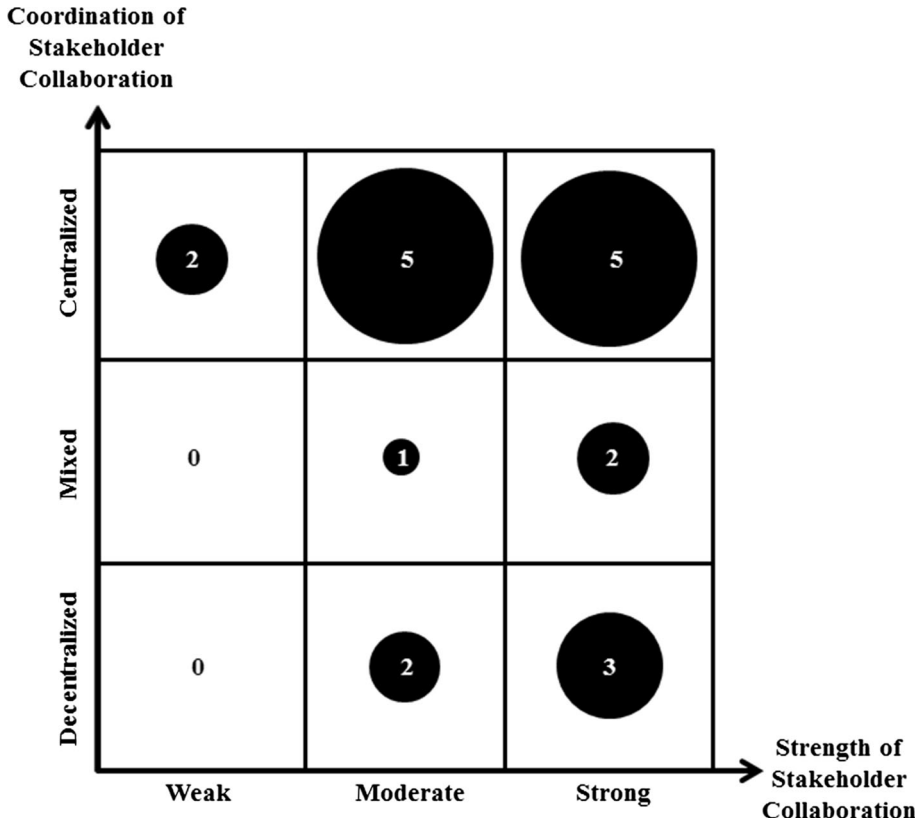

Fig. 2 Strength and coordination of stakeholder collaboration matrix

collaboration approaches (see Fig. 2). All 20 examined HEIs engage in some form of stakeholder collaboration. Numerous interviewees have uniformly reported that stakeholder collaboration matters in the context of entrepreneurship education and can influence the success or failure of educational undertakings. The strength and support from the entrepreneurial ecosystem, the entrepreneurial community and the stakeholder network are explicitly mentioned in several cases as key success factor and asset for HEIs. The establishment of strong stakeholder collaboration requires resources, time, flexibility, support and commitment. According to the interviewees HEIs need to embrace long-term stakeholder collaboration in entrepreneurship education and thereby have the possibility to shape and create their own entrepreneurial ecosystem.

4.3 Coordination of stakeholder collaboration

Concerning the coordination of stakeholder collaboration, a centralized approach has been employed by twelve HEIs next to a mixed approach by three and a decentralized by five HEIs (see Fig. 2). A centralized approach in this context implies that the majority of all entrepreneurship education activities and the respective stakeholder collaboration are coordinated by a central hub, be it an entrepreneurship centre, a chair or an institute. Instead of using external support services for entrepreneurs, some universities internalized

such offers through the creation of own entrepreneurship foundations and institutions. Simultaneously, there might be designated positions for entrepreneurship, such as a vice rector, for entrepreneurship and verbalized commitment to entrepreneurship and entrepreneurship education from university management. Key persons may act as driver of entrepreneurship education and centrally coordinate educational activities. In rare cases separate individuals are determined who are responsible for managing external relations on a national and/or international scale. Formal network thereby may facilitate stakeholder communication. In contrast, a decentralized approach implies that there is very limited university-wide coordination of entrepreneurship activities and little internal cooperation between different chairs, departments or faculties. Instead there is a variety of different, individual entrepreneurship education activities with a variety of stakeholder collaboration approaches. Freedom and autonomy to act for entrepreneurship educators is generally high and networks are formed on an informal, personal basis. A mixed approach to entrepreneurship education and stakeholder collaboration lies in between a centralized and a decentralized approach with moderate coordination and sporadic communication between actors. There is usually a central hub for entrepreneurship education next to further key actors outside the hub. Networks can be established on a formal or informal basis.

These findings related to Fig. 2 are in accordance with the existing literature in the field (e.g. Streeter et al. 2002). Prior research has highlighted the importance of leadership and commitment from entrepreneurship educators and university management for the success of entrepreneurship education (Vesper and Gartner 1997). The importance of entrepreneurship should ideally be explicitly articulated in a university's mission statement. A further important indicator of the quality of entrepreneurship education is stakeholder satisfaction based on the extent to which internal and external stakeholder needs and expectations are identified and addressed (Vesper and Gartner 1997; Hynes and Richardson 2007; Matlay and Carey 2007; Duval-Couetil 2013). Duval-Couetil (2013) respectively proposes a stakeholder-driven approach for the assessment of entrepreneurship education. Strong engagement with external stakeholders is considered to be crucial for the design, delivery and development of entrepreneurship education (Hynes and Richardson 2007). Further studies on entrepreneurship teachers have emphasized the need for stronger coordination of entrepreneurship education activities within institutions to foster the creation of a stronger entrepreneurial community (Seikkula-Leino et al. 2010).

4.4 Forms of stakeholder involvement

Based on a qualitative content analysis, ten support categories for stakeholder involvement in entrepreneurship education at HEIs could be identified: Feedback; expertise; supervision; activities; design; funding; placements; exchange; experience; and development. These categories can be further broken down into 17 forms of involvement, namely advising and consulting; coaching and mentoring; intellectual property screening and patenting; board membership; judge and panel membership; organization of events/competitions/excursions; curriculum development; finance and investments; sponsorship; internship placements; provision of office space and location; provision of infrastructure; knowledge exchange; project collaboration and partnerships; provision of networks and contacts; lecturing and story-telling; and provision of trainings and workshops. The form of involvement varies per stakeholder groups as visualized by the frequency counts per category in Table 2 of the Appendix.

4.4.1 Entrepreneurs

Entrepreneurs as stakeholder group play a particularly important role in entrepreneurship education as the examined cases revealed strong ties to enterprises. 18 out of 20 HEIs display active cooperation with entrepreneurs. The form of involvement of entrepreneurs is diverse and extensive. The most common forms of engagement in entrepreneurship education are lecturing and story-telling next to coaching and mentoring activities. Financial support might be provided from entrepreneurs to chairs or to university start-ups through sponsoring or investment activities. Moreover, entrepreneurs may be involved in the organization of events, such as integrated business plan competitions, entrepreneurship-related summer schools or business evenings. Further forms of engagement include partnerships and collaboration in start-up projects, the provision of networks and contacts as well as student internship placements. Entrepreneurs might be engaged in entrepreneurship education by being a judge at a start-up competition or by advising and consulting students or young entrepreneurs. It should ultimately be mentioned that besides offering educational activities themselves, entrepreneurs can also be customers or users of entrepreneurship education by participating entrepreneurship offers or by attending events of the respective HEIs.

4.4.2 Companies

Similarly, collaboration in entrepreneurship education with companies is widespread with 17 HEIs stressing forms of involvement by company representatives. Companies in this context are mostly small and medium size enterprises due to the entrepreneurship focus although some HEIs also cooperate with large enterprises. In contrast to other examined HEIs, it was explicitly pointed out in one case as a challenge that small and medium enterprises are underrepresented in the region and therefore a focus has to be set on collaborating with large firms. The forms of involvement by company representatives are widespread and similar to the types of engagement by entrepreneurs. The most frequent collaborations in the context of entrepreneurship education are through lecturing and story-telling or coaching and mentoring as well as board membership, joint projects and internship placements. Furthermore, companies might also provide funding, trainings and workshops or networks and contacts. Besides, collaboration can occur in form of curriculum development, advising and consulting services, panel membership or event organization.

4.4.3 Financial institutions

Nine of the 20 HEIs report about interactions in entrepreneurship education with financial institutions. These institutions might have a public or private origin. Forms of collaboration are specialized and include mostly financial support through funding in form of sponsorship, finance and investments. Less common forms of involvement in entrepreneurship education from financial institutions encompass coaching or mentoring services, guest lecturers or being a panel member for the evaluation of idea pitches.

4.4.4 Support service providers

In nine cases the provision of support services in collaboration with the examined HEIs in the context of entrepreneurship education is mentioned. The types of support are highly

diverse being foremost provided by public support service organizations and private consultancies. Support services could either be paid or be executed on a pro-bono basis and are at times exclusively targeted at students and graduates with entrepreneurial intentions. The types of support range from the provision of training courses, networking possibilities and funding through loans and venture capital to intellectual property screening and patenting support. Further involvement in entrepreneurship education is through lecturing, board representation, curriculum development support as well as advising, mentoring, coaching or consulting services for university entrepreneurs.

4.4.5 Incubators and accelerators

Twelve of the examined HEIs reveal an active collaboration with incubators and/or accelerators in the provision of entrepreneurship education. The forms of collaboration are broad ranging from guest lectures by representatives from incubators or accelerators, extensive knowledge exchange and networking between academics and practitioners to the joint organization of seminars, projects, workshops, conferences or other events. By far the most common form of stakeholder engagement is the encouragement and support of innovative start-ups through the provision of funding, coaching, business advice, expertise and infrastructure or office space.

4.4.6 Student organizations

As a further external stakeholder group of entrepreneurship education, student organizations are emphasized as collaboration partner in entrepreneurship education in six of the 20 HEIs. Cooperation takes primarily place through the joint organization of competitions, workshops, excursions or networking events. These initiatives are foremost conducted as extra-curricular activities. Representatives of student organizations do occasionally also get involved in entrepreneurship education as guest lecturers, coaches and mentors, by providing funding or by initiating knowledge exchange.

4.4.7 Alumni

14 of the 20 HEIs state initiatives to cooperate with alumni in the provision of entrepreneurship education. Most frequently, alumni are part of university networks or entrepreneurship clubs and therefore offer valuable network and knowledge exchange possibilities. Alumni might be integrated into teaching activities as guest lecturers, mentors or through the provision of funding, start-up support and consulting to student entrepreneurs. They might further serve as advisory board members, judge and panel members or as organiser of events and workshops. Numerous interviews further stressed the need to intensify cooperation with alumni being a stakeholder group which frequently gets neglected.

4.4.8 Higher educational institutions

13 examined HEIs report about collaborations with other HEIs in the context of entrepreneurship education. In particular, international relationships with universities play an important role since this is the stakeholder group with the strongest international relations in comparison to most other stakeholder groups where an emphasis is placed on

local or regional stakeholder relations. The type of cooperation with foreign universities might be informally or formally established. These universities serve as networks or partner universities for the exchange of best practices or engagement in strategic partnerships. Thus, networks, partnerships and conferences can represent an initial form of collaboration. At times, student conferences might be jointly organized. HEIs might also cooperate in the joint organization of or mutual participation in events, trainings or bootcamps in the field of entrepreneurship. These activities could be targeted at students and/or university staff. Research projects might also be executed in partnership with other universities. Besides, cooperation can take place through the engagement in international team teaching approaches in entrepreneurship education. Further types of cooperation include the mutual exchange of students within entrepreneurship education programs or the establishment of international double-degree teaching programs.

4.4.9 Science and technology parks

13 of the 20 HEIs display strong relationships with local science and technology parks. The form of cooperation is highly focused on the provision of office space and location, knowledge exchange and project collaboration. Co-working spaces for start-ups are frequently located in science and technology parks. Less common forms of involvement include the provision of infrastructures, the organization of events, curriculum development as well as coaching and mentoring and development and networking activities.

4.4.10 Governmental organizations

In exactly half of the cases stakeholder collaboration with governmental organizations is reported. The most frequent forms of involvement encompass board membership, joint curriculum development, knowledge exchange and project collaboration and the provision of networks and contacts. Rarer forms of collaboration are advising and consulting services, joint activities and trainings, funding, provision of infrastructure, experience sharing and panel memberships. A focus is set overall on local and national partnerships with governmental organizations. In particular, the chamber of commerce is mentioned as key collaboration partner for entrepreneurship education.

4.4.11 Non-governmental organizations

Non-governmental organizations are involved in entrepreneurship education solely in four of the 20 HEIs which represents the lowest involvement frequency out of the twelve different stakeholder groups. Hereby, the forms of involvement are equally diverse encompassing the provision of feedback, advice, experience, infrastructure and funding as well as the organization of activities and workshops next to engagement in networking and partnerships.

4.4.12 Other organizations

Ultimately, eight HEI reveal forms of stakeholder collaboration with other organizations. Examples include the collaboration with established networks, associations or institutes foremost on a local level. The forms of involvement in this context range from offering

feedback and development opportunities over lecturing and story-telling to networking, knowledge exchange and event organization.

4.5 Entrepreneurial ecosystems of higher educational institutions

The findings on stakeholder involvement per stakeholder group above reveal that stakeholder collaboration in entrepreneurship education differs among stakeholder groups and among HEIs. Entrepreneurs and company representatives are most frequently engaged in entrepreneurship education. Based on the results entrepreneurs, company representatives, alumni, other HEIs, science and technology parks, incubators and accelerators and governmental institutions can be described as most involved and hence primary stakeholders of entrepreneurship education. In contrast, financial institutions, support service providers, other organizations, student organizations and non-governmental organizations represent secondary stakeholders of entrepreneurship education at HEIs. The most common types of stakeholder involvement in entrepreneurship education include lecturing and storytelling, organization of events, provision of networks, knowledge exchange, coaching and mentoring.

The diversity of stakeholder groups and initiatives being employed thus suggest that it may not be sufficient to look at the stakeholder groups on an individual level but to employ a systemic approach. As described in the literature review above, the entrepreneurial ecosystems literature draws on such a systemic perspective by examining the interactions of an enterprise with its environment as a whole through the notion of social embeddedness (Jack and Anderson 2002). The results of the case studies indicate that HEIs collaborate with a large and heterogeneous number of stakeholders in a multitude of ways. Collaboration with regard to entrepreneurship education is generally between stakeholder groups and HEIs, but beyond that collaboration between different stakeholder groups in entrepreneurial activities without the involvement of HEIs can be observed. Knowledge and communication flows between each stakeholder group and the respective HEIs occur bilaterally. In the context of the case studies a practical, hands-on perspective on entrepreneurship is generally employed by external stakeholders whereas internal stakeholders of the HEIs foremost represented the theoretical, academic aspects of entrepreneurship education which suggests complementary knowledge and skill sets. In related terms, past research by Audretsch and Lehmann (2005) has revealed a positive relationship between universities in regions with high knowledge capacity and knowledge output and entrepreneurial activity as measured by the number of start-ups in that region. The interviewees of the European case studies have undermined this spatial dimension of entrepreneurship education by stressing that stakeholder collaboration approaches differ contingent upon the specific external environment of HEIs. The findings above are in line with research in the United Kingdom by Matlay (2009) stating that:

> […] stakeholder involvement in entrepreneurship education is explicit, widespread and linked to ongoing educational developments […] Stakeholders' expectations are equally complex and varied, reflecting a heterogeneous range of individual, group and community needs (p. 355).

4.6 Stakeholder management approaches

The findings of this study indicate that none of the examined 20 HEIs possesses an explicit, verbalized strategy for the management of its external stakeholder relations in the context

of entrepreneurship education. Stakeholder theory highlights the importance of a formulated stakeholder management strategy primarily in a corporate context. On the one hand, the cross-case analysis reveals that theories on stakeholder management at HEIs receive little attention, both in theory with a restricted amount of theoretical frameworks for HEIs and in practice with a lack of formal stakeholder management approaches being employed at HEIs. Those two aspects may reinforce one another. On the other hand, the results show that relationships with external stakeholders are of utmost importance to HEIs. Hereby, different types of external stakeholders of HEIs as well as different forms of engagement at different levels can be distinguished. Collaboration is mostly employed in the form of cooperation and partnership. Little information could be obtained with regard to conflicting stakeholder interests, demands and needs. However, no evidence of awareness of these external stakeholder interests of HEIs related to entrepreneurship education could be gathered either. These findings emphasise the need that HEIs involved in entrepreneurship education should employ a structured and strategic approach to its stakeholder management. The numerous concepts and frameworks from the business and management literature might be used as a starting point and being tailored to the educational sector and the university context.

4.7 Expert interviews

The results of the expert interviews enable additional insights into the context of entrepreneurship education, stakeholder collaboration and entrepreneurial ecosystems. The importance of stakeholder collaboration for entrepreneurship education at HEIs is underlined by several experts. External stakeholder involvement is deemed necessary and valuable to provide high quality entrepreneurship education. According to one interviewee, *[…] stakeholders of the ecosystem should align themselves to promote entrepreneurship education.* In particular, the need for stronger alumni networks with entrepreneurial success stories and for more cooperation between HEIs for benchmarking and an exchange of good practices in entrepreneurship education is emphasized. Stakeholder collaboration in entrepreneurship education is described as a win–win-situation where not only HEIs can benefit but also external stakeholders through inspiration, new ideas, feedback, networks and increased influence in shaping future entrepreneurship education at HEIs.

Regarding the coordination of entrepreneurship education it is stressed in the expert interviews that a combination of top-down and bottom-up approaches is needed. Entrepreneurship has to become a priority at HEIs with commitment, support and dedication from university management. At the same time, flexibility and freedom for entrepreneurship educators is required to fulfill the unique requirements of entrepreneurship education. In this context, informal or formal networks are regarded beneficial to provide an overview of the entrepreneurship community, to connect different stakeholders and to communicate about existing entrepreneurial activities. A strong network can facilitate external stakeholder management and can create a pool of possible contacts to choose from in order to engage in stakeholder collaboration. In particular, the role of entrepreneurship-related clubs or networks is highlighted.

Furthermore, it is stated that qualified entrepreneurship educators or instructors are of utmost importance for the provision of entrepreneurship education. As one expert puts it *[…] successful entrepreneurship education depends on the initiatives of individuals.* Commitment, passion, knowledge, experience and network of the stakeholders can influence the quality of entrepreneurship education. The consensus is that entrepreneurship education should contain practical and theoretical elements and activities. Whereas

academic from within HEIs foremost represent the theoretical side of entrepreneurship education, external stakeholders can generally contribute to the practical components. Team teaching with a combination of academics and practitioners is therefore a preferred approach. To overcome a present shortage of qualified teaching staff, further training is needed to assure high quality entrepreneurship education. Such training should be provided for internal and external stakeholders involved in entrepreneurship education. Collaboration is not solely deemed necessary outside of HEIs but also within different disciplines and faculties of HEIs to create an interdisciplinary and trans-disciplinary perception of entrepreneurship education.

Moreover, the importance of the entrepreneurial ecosystem is stressed throughout the expert interviews as revealed by one exemplary interview statement below:

> You can educate entrepreneurship as much as you want, but if there are no role models around as an input and if there is no entrepreneurial […] ecosystem at the output side, it will not deliver the impact that we would like it to have. […] Just educating Entrepreneurship is not enough; it needs the entrepreneurial context to stimulate the awareness but also to enable the scale-up and the effectiveness of entrepreneurship in practice.

Embedding the stakeholders of the entrepreneurial ecosystem can thus impact the quality of entrepreneurship education. HEIs therefore need to deeply analyse their entrepreneurial ecosystem and develop an approach to stakeholder collaboration. As a cautionary note, it is pointed out that HEIs should learn from each other but should simultaneously consider their contextual differences. These differences are considered an important asset. Experts agreed that there should not be a one-size-fits-all approach to entrepreneurship education at HEIs. Instead there exists heterogeneity of unique political, economical, historical and cultural contexts. Each HEI has its own personalized stakeholder groups and therefore stakeholder management required a personalized approach.

4.8 Propositions

Based on the overall analysis above the following six propositions can be derived:

Proposition 1 The key stakeholder groups of entrepreneurship education differ among HEIs.

Proposition 2 The type of stakeholder involvement in entrepreneurship education differs among stakeholder groups.

Proposition 3 The type of stakeholder involvement in entrepreneurship education differs among HEIs.

Proposition 4 The relevance of stakeholder collaboration in entrepreneurship education differs among HEIs.

Proposition 5 The strength of stakeholder collaboration in entrepreneurship education differs among HEIs.

Proposition 6 The formalization of stakeholder collaboration in entrepreneurship education differs among HEIs.

4.9 Discussions of the findings

The results reveal that stakeholder collaboration and involvement matters in the context of entrepreneurship education. All examined higher educational institutions engage in stakeholder collaboration and engagement of stakeholders appears to be needed for the successful provision of entrepreneurship education. The type of stakeholder involvement, the strength of stakeholder engagement, the geographical scope of stakeholder collaboration and the formalization of stakeholder management vary among HEIs. Certain stakeholder might provide tailored, specialized support whereas others provide broad and extensive support.

There seems to be no one-size-fits-all approach to stakeholder management and stakeholder involvement in entrepreneurship education. HEIs differ in terms of their political economical and cultural environments and their histories. The expert interviews have highlighted the need to tailor the specific stakeholder management strategies to the contexts of the respective HEIs. It is important to investigate which strategies work in which contextual setting in further research. HEIs need to individually identify their key stakeholder groups and develop a suitable approach for stakeholder collaboration and involvement.

A distinction should be made among different goals of entrepreneurship education. Some educational activities aim at increasing entrepreneurial awareness and creating entrepreneurial mindset while others are directed at teaching about, through and for entrepreneurship and entrepreneurial behavior. For entrepreneurship education to thrive not solely financial resources are needed but also commitment and particular commitment and support from university management can be a strong driving force of entrepreneurship education.

Opinions diverged with regard to the formalization of entrepreneurship education. Key positions for stakeholder relations were generally considered beneficial for stakeholder management. Also stakeholder communication was regarded essential by experts for the purpose of increased transparency. Coordination further appears to be relevant in the context of entrepreneurship education in order to avoid duplication of effort. At times, a key institution such as an entrepreneurial center can facilitate the coordination of entrepreneurship education activities as an entrepreneurial hub. In this context especially a train the trainer's approach and a sensitization of instructors for entrepreneurship and stakeholder collaboration is essential for the success of entrepreneurship education.

The success of entrepreneurship education and stakeholder involvement can depend on people. Persons may either act as promoters of activities or may resist change. The findings reveal that the continuity of entrepreneurship education frequently depends on key persons and their long-term commitment and motivation. Turnover of such key personnel is mentioned as a challenge for the long-term planning of entrepreneurship education. In similar terms personal networks of individual stakeholders are of high importance and can facilitate the establishment of new stakeholder relationships.

Traditional stakeholder management techniques and tools from the business environment have not yet found in depth application at HEIs with regard to entrepreneurship education. In the expert interviews it was considered as beneficial to transfer existing approaches from the business field to the educational field. A profound approach to stakeholder management can consequently increase the tailored impact of stakeholder involvement in entrepreneurship education.

5 Conclusion and discussion

This paper has investigated entrepreneurial ecosystems of European HEIs by examining the role of stakeholder collaboration in entrepreneurship education. In this respect, key external stakeholder groups of entrepreneurship of HEIs and their forms of involvement in entrepreneurship education have been identified. The results of the 20 European case studies indicate that stakeholder involvement in entrepreneurship education at HEIs is overall rather strong and extensive. All twenty case studies emphasize the importance of stakeholder collaboration in entrepreneurship education. In several case studies it is stated that stable, extensive, long-term stakeholder relationship and a supporting entrepreneurial ecosystem can be key success factors for entrepreneurship education through the exchange of best practices and the transferability of successful entrepreneurship education approaches. While the importance of coordinated stakeholder engagement is emphasized, numerous HEIs currently lack an overarching and formalized stakeholder management approach. Entrepreneurship education practices frequently involve hoc based on individual initiatives which may be bottom-up or top-down. At the same time, interviewees clearly stress the need for more extensive and well-coordinated stakeholder involvement to addresses the demands and expectations of key stakeholder groups.

The findings of the case studies further reveal that stakeholder involvement does vary among stakeholder groups and HEIs. Entrepreneurs and company representatives are the external stakeholder groups which are most frequently involved in entrepreneurship education. In terms of the forms of involvement, the provision of feedback through coaching and mentoring, the sharing of experience through lecturing and storytelling, the organization of events as well as the exchange of knowledge and the provision of networks represent the most common forms of stakeholder engagement. Overall, the results of the case studies indicate that external stakeholder involvement transmits foremost practical, real-life aspects of entrepreneurship education. This practical perspective can complement the theoretical, academic view on entrepreneurship which is more frequently employed by internal entrepreneurship educators. The results of the case study interviews have correspondingly revealed that students value these practical components of entrepreneurship education and endorse external stakeholder involvement in entrepreneurship education.

A rich literature has further identified the key role played by entrepreneurship in spurring technology transfer. Whether entrepreneurship is exogenous or endogenously stimulated through purposeful instruments and policies is less certain. In identifying entrepreneurship education as one important mechanism that can be deployed to simulate entrepreneurship and ultimately technology transfer, this paper opens a new conversation by merging the fields of entrepreneurship education, entrepreneurial ecosystems and stakeholder theory. Thus far little attention has been paid in theory and in practice to establishing structured approaches to managing stakeholder relationships with regard to entrepreneurship education at HEIs. On the one hand, the literature in the field of stakeholder management has primarily focused on the business sector, in general, and multinational corporations, in particular, whereas the theme of entrepreneurial ecosystems has frequently been discussed from a system theory or regional economic perspective. The entrepreneurship education literature, on the other hand, has focused on HEIs but has failed to acknowledge the importance of stakeholder relationships and the embeddedness within the relevant entrepreneurial ecosystem.

By providing an overview of the forms of involvement and collaboration between the stakeholders in the context of entrepreneurship education, a better understanding of the entrepreneurial ecosystem of HEIs can be developed. The proposed set of propositions offers a starting point future research in the field. In doing so, the authors of this paper hope to pave the road towards the development of further stakeholder management theories and strategies for entrepreneurship education for HEIs to proactively shape one's entrepreneurial ecosystem. This paper consequently contributes to existing research by revealing that stakeholder collaboration and stakeholder involvements matter in the context of entrepreneurship education at HEIs.

These results can further serve as guidance for entrepreneurship educators, university management and policy makers for developing extensive and coordinated strategies on stakeholder engagement at HEIs. Identifying key stakeholders of an entrepreneurial ecosystem and their needs and relationships offers a systemic perspective on entrepreneurship education. Potential strength and weaknesses of an entrepreneurial ecosystem can be revealed and addressed. In developing a collaborative and strategic stakeholder management approach, the quality of entrepreneurship education at HEIs could be enhanced. This can ultimately strengthen the entrepreneurial ecosystem as a whole through strong and focused stakeholder networks and collaboration.

Despite the contributions made by this paper, its limitations should also be pointed out. While this paper provides an overview of the forms of stakeholder collaboration, the strengths of the individual stakeholder relationships are not measured. The case studies further focus on external stakeholder relations while neglecting internal stakeholder collaboration in entrepreneurship education within HEIs. A clear and exclusive distinction among stakeholder groups can at times be challenging. A support service provider might have a governmental background, an incubator might be part of a science park or an entrepreneur might simultaneously be an alumni. Hence, a certain overlap among stakeholder groups cannot be excluded. Moreover, although research at all 20 examined HEIs was conducted thoroughly, the results of the case studies cannot be claimed to be fully exhaustive. All reported stakeholder collaborations have been reviewed rigorously for integrity through external and internal validations. Nonetheless, there might be cases where particular types of stakeholder collaborations were simply not reported due to unawareness by the interviewees. Stakeholder relationships of HEIs are a complex endeavor which requires a systemic and extensive research approach to accurately represent the layers and components of the entire entrepreneurial ecosystem.

Future research could build upon the findings of this paper in four ways. First, the developed propositions could be empirically tested. Second, further studies could measure and compare the strengths of the individual stakeholder relationships and their contingencies. Thereby the specific relevance of each stakeholder group could be quantified to identify the most important stakeholder groups for collaboration. Special attention could be paid to the internal stakeholder relationships in addition to the external dimension. On the basis of these results, a typology of different forms of stakeholder collaboration in entrepreneurship education at HEIs could be established. Third, future research could identify how the entrepreneurial ecosystem can foster collaboration between different stakeholders in the context of entrepreneurship education by comparing the actual and desired forms of stakeholder support, involvement and collaboration. In this context, a quantitative study design could be employed which displays causal linkages between the type of stakeholder support provided and its influence on entrepreneurship education at HEIs. Fourth, further research could build upon the findings of this study and additional

literature from the field of stakeholder theory to develop a theoretical framework for identifying, prioritizing and managing stakeholder relationships which is tailored to the context of HEIs and entrepreneurship education.

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Appendix

See Tables 1 and 2.

Table 1 Stakeholder involvement in entrepreneurship education at higher educational institutions per stakeholder group

Cases	ENT	COM	FI	SSP	IA	SO	AL	HEI	STP	GO	NGO	OO	Sum
HEI #1	X	X			X	X	X		X		X	X	8
HEI #2	X	X	X	X	X	X	X						7
HEI #3	X	X			X		X		X	X		X	7
HEI #4	X	X	X	X	X			X	X	X			8
HEI #5	X	X	X	X	X		X	X	X	X		X	10
HEI #6	X							X	X				3
HEI #7	X	X			X	X			X	X		X	7
HEI #8	X	X	X				X	X					5
HEI #9	X	X	X	X	X		X	X	X		X		9
HEI #10	X	X		X	X		X		X	X			7
HEI #11	X	X	X					X					4
HEI #12				X	X		X	X	X	X			6
HEI #13	X	X	X	X	X	X	X	X	X	X			10
HEI #14		X				X	X	X	X	X	X	X	8
HEI #15	X	X	X		X			X					5
HEI #16	X				X		X	X	X	X	X	X	8
HEI #17	X	X				X	X						4
HEI #18	X	X						X				X	4
HEI #19	X	X		X			X	X	X	X		X	8
HEI #20	X	X	X	X			X						5
Sum	18	17	9	9	12	6	14	13	13	10	4	8	133

ENT entrepreneurs, *COM* companies, *FI* financial institutions, *SSP* support service providers, *IA* incubators and accelerators, *SO* student organizations, *AL* alumni, *HEI* higher educational institutions, *STP* science and technology parks, *GO* governmental organizations, *NGO* non-governmental organizations, *OO* other organizations (e.g. Associations, Networks, Institutions), X, Stakeholder Involvement

Table 2 Forms of stakeholder involvement in entrepreneurship education per stakeholder group

Support category	Form of involvement	ENT	COM	FI	SSP	IA	SO	AL	HEI	STP	GO	NGO	OO	Sum
Feedback	Advising and consulting	4	3	0	3	2	0	1	0	0	1	1	2	17
	Coaching and mentoring	8	5	1	3	2	1	1	0	1	0	1	1	24
Expertise	Intellectual property screening and patenting	0	0	0	2	2	0	0	0	0	0	0	0	4
Supervision	Board membership	3	5	0	2	0	0	3	1	0	3	0	0	17
	Judge and panel membership	3	1	1	0	1	0	2	0	0	1	0	0	9
Activities	Organization of events/competitions/excursions	3	3	0	0	4	5	2	4	2	1	1	2	27
Design	Curriculum development	1	3	0	2	1	0	0	4	1	3	0	0	15
Funding	Finance and investments	3	2	6	1	3	1	1	0	0	1	1	1	20
	Sponsorship	3	3	1	0	0	0	1	0	0	0	0	0	8
Placements	Internship placements	4	4	1	0	0	0	0	0	0	0	0	0	9
	Provision of office space and location	0	0	0	1	6	0	0	0	5	0	0	0	12
	Provision of infrastructure	0	0	0	1	6	0	0	0	2	1	1	1	12
Exchange	Knowledge exchange	0	0	0	2	4	1	3	6	4	2	0	2	24
	Project collaboration and partnerships	5	4	0	1	2	0	0	2	3	3	1	1	22
	Provision of networks and contacts	1	3	0	2	3	3	6	2	1	2	1	3	27
Experience	Lecturing and storytelling	13	7	1	1	1	2	4	0	0	1	1	2	33
Development	Provision of trainings and workshops	3	4	0	2	4	2	2	3	1	1	0	4	26
	Sum	54	47	11	23	41	15	26	22	20	20	8	19	304

ENT entrepreneurs, *COM* companies, *FI* financial institutions, *SSP* support service providers, *IA* incubators and accelerators, *SO* student organizations, *AL* alumni, *HEI* higher educational institutions, *STP* science and technology parks, *GO* governmental organizations, *NGO* non-governmental organizations, *OO* other organizations (e.g. Associations, Networks, Institutions)

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