

## Inspiration Fiche

# Entrepreneurial Teaching and Learning

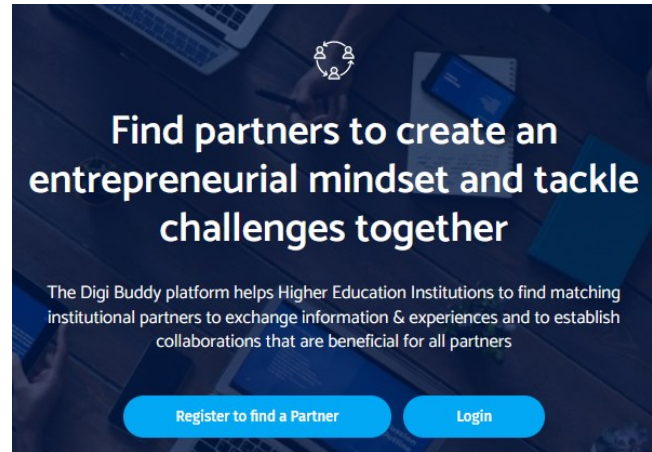
**Andrea Kottmann**  
**CHEPS, University of Twente**

## Inspiration Fiches

*Digi Buddy* is a web-based platform (<https://www.digi-buddy.eu/>) for HEIs seeking support and partners for collaboration and peer-learning when strengthening entrepreneurship in their institutions.

Through the Digi Buddy System HEIs can start engaging in peer-learning, exchanging experiences, and discussing plans. The platform allows HEIs to contact other HEIs on the platform that also are interested to work on similar projects or tackle similar challenges.

Digi Buddy facilitates collaboration and networking, and possibly mentorship opportunities between HEIs.



### ***Inspiration Fiches***

HEI practitioners and managers using the Digi Buddy system are provided with the opportunity to not only contact like-minded institutions/individuals, but also to access information on the basis of thematic clusters, and challenges through an “Inspiration Fiche”.

This fiche is a piece of condensed information about strategies, policies and initiatives undertaken by HEIs to address the entrepreneurship and innovation agenda. The Fiche is based on (practical) HEInnovate & BeyondScale experiences and the academic literature on transformation processes in higher education.

The fiches provide a unique set of recommendations on how HEIs can use the HEInnovate approach to further their entrepreneurial agenda. They also provide narratives describing the outcomes, contribution and impact of the use and experimentation with HEInnovate in achieving the outcomes and objectives in each activity area.

Being a digital tool, the fiche links its users to the evidence underlying the keywords in the fiche.

For example, a user interested in the **intervention “Train Teachers”** will be provided with a pop-up window that includes a presentation or definition of such a centre and provides links to other issues that are related to implementing these centres, such as the resources and inputs, potential barriers, and motivators, etc. In addition, the pop up-windows will include links to the most relevant publications underlying the evidence that is summarised in the texts.

**Online versions of the Inspiration Fiche:** <https://www.digi-buddy.eu/>

## Challenge/Goals

### Tile 1: Create entrepreneurial skills in students

Title	Create entrepreneurial skills in students
<b>Introduction/ Background</b>	<p>In line with recent educational reforms, higher education institutions are requested to equip students with transversal or soft skills to prepare them better for their later jobs and careers in labour markets beyond academia. Entrepreneurial skills are part of these transversal and soft skills. Recently, the European Skills Agenda has been expanded to domains beyond labour markets. Now, also skills that support the green deal, are relevant for nurturing social inclusion and make individuals and societies more resilient in reacting to crisis.</p>
<b>The goal</b>	<p>Foremost, entrepreneurship education aims at creating skills in students that increases their later employability and supports them in developing an entrepreneurial mindset.</p> <p>The Entrecomp Framework helps higher education institutions in identifying relevant entrepreneurial competencies and defining learning outcomes.</p> <p>Entrecomp distinguishes three main areas with five specific competencies:</p> <ul style="list-style-type: none"> <li>- The area ‘ideas and opportunities’ links to competencies that enable students, to develop, evaluate and select ideas and opportunities (also against ethical and sustainability backgrounds)</li> <li>- The area ‘resources’ includes competencies to mobilise and use own resources and those of other while considering ethical and sustainability issues</li> <li>- The area ‘into action’ includes competencies to act upon ideas and realise them through e.g., team work competencies or planning and management</li> </ul>
<b>Examples of interventions at institutional level</b>	<ul style="list-style-type: none"> <li>- Integrating entrepreneurship education in higher education teaching and learning can differ substantially with regard to form and scope: Large-scale interventions foremost include the change of the curricula through e.g., the definition of additional learning outcomes. Small-scale interventions include the implementation of (new) didactical methods or tools such as serious games or case studies.</li> </ul>
<b>Other relevant resources</b>	<ul style="list-style-type: none"> <li>- Information on the Entrecomp framework, including support material etc.: <a href="https://joint-research-centre.ec.europa.eu/entrecomp-entrepreneurship-competence-framework_en">https://joint-research-centre.ec.europa.eu/entrecomp-entrepreneurship-competence-framework_en</a></li> </ul>
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Tampere University of Applied Sciences, Finland: Team learning and team entrepreneurship; <a href="https://heinnovate.eu/sites/default/files/tampere_uas_team_learning_and_entrepreneurship.pdf">https://heinnovate.eu/sites/default/files/tampere_uas_team_learning_and_entrepreneurship.pdf</a></li> </ul>

<b>Title</b>	<b>Create entrepreneurial skills in students</b>
	- Milan Polytechnic University, Italy: Experience-oriented entrepreneurship education; <a href="https://heinnovate.eu/sites/default/files/milan_polytechnic_university_experience-oriented_entrepreneurship_education.pdf">https://heinnovate.eu/sites/default/files/milan_polytechnic_university_experience-oriented_entrepreneurship_education.pdf</a>
<b>Further reading</b>	<p>Bridge, Simon; Hegarty, Cecilia; Porter, Sharon (2010): Rediscovering Enterprise: Developing Appropriate University Entrepreneurship Education. In <i>Education &amp; Training</i> 52, pp. 722–734. <a href="https://doi.org/10.1108/00400911011089015">https://doi.org/10.1108/00400911011089015</a></p> <p>Dinning, Track (2019): Articulating Entrepreneurial Competencies in the Undergraduate Curricular. In <i>Education &amp; Training</i> 61, pp. 432–444. <a href="https://doi.org/10.1108/ET-09-2018-0197">https://doi.org/10.1108/ET-09-2018-0197</a></p> <p>Williams, Perri; Fenton, Mary (2013): Towards a Good Practice Model for an Entrepreneurial HEI: Perspectives of Academics, Enterprise Enablers and Graduate Entrepreneurs. In <i>Industry and Higher Education</i> 27, pp. 499–506. <a href="https://doi.org/10.5367/ihe.2013.0183">https://doi.org/10.5367/ihe.2013.0183</a></p>
<b>Links to further Tiles</b>	<ul style="list-style-type: none"> <li>➔ Change of curricula (3)</li> <li>➔ Train teachers (4)</li> </ul>

**Tile 2: Create student entrepreneurs**

<b>Title</b>	<b>Create student entrepreneurs</b>
<b>Introduction/ Background</b>	<p>Creating student entrepreneurs refers to supporting and educating students who want to start their own business already during their study or upon their graduation. The creation of student entrepreneurs is, besides the creation of entrepreneurial skills a major important goal of entrepreneurial teaching and learning. Promoting the creation of student or graduate businesses contributes to regional development and innovation capacity.</p>
<b>The goal</b>	<p>The term ‘student entrepreneur’ points to students who started their own company or business already during their studies or shortly upon graduation.</p> <p>Higher education institutions can support these students with special programmes and initiatives. Both can help students to translate their ideas into business plans, find investors, provide seed money or infrastructure.</p> <p>Creating student entrepreneurs aims at increasing the (regional) innovation capacity and create employment opportunities for students and other highly qualified persons.</p> <p>Supporting student to venture into their own business is a huge challenge for higher education institutions. Successful programmes and initiatives</p> <ul style="list-style-type: none"> <li>- need to make substantial investments, e.g. providing infrastructure (laboratories, office space) and eventually seed money to start up the business;</li> <li>- need to have expertise and experience in setting up companies and business;</li> <li>- need to have established networks with their regional economy;</li> <li>- should have set up educational modules or programmes on entrepreneurship</li> </ul>
<b>Examples of interventions at institutional level</b>	<ul style="list-style-type: none"> <li>- <b>Venture Creation Programmes</b> which can be defined as: “entrepreneurship education programs which utilize the on-going creation of a real-life venture as the primary learning vessel (thus involving venture creation as part of the formal curriculum), including intention to incorporate” Lackus and Middleton (2015) analyse the types of educational programmes and mention five design principles that contribute to their success: “targeting and selecting students, creating start-up teams, collaborating with external partners, designing the learning environment, developing entrepreneurial attitudes”.</li> <li>- <b>Campus Incubators:</b> these are organisations that are located at the boundaries of higher education institutions and link between the institution and the (regional) business sector. Main functions of such a business incubator are: <ul style="list-style-type: none"> <li>- Provide physical infrastructure for business start-ups</li> </ul> </li> </ul>

<b>Title</b>	<b>Create student entrepreneurs</b>
	<ul style="list-style-type: none"> <li>- Link start-ups and the (regional) business-sector through networking activities</li> <li>- Supporting start-ups in their first years</li> </ul>
<b>Support at European level</b>	The European Commission supports start-ups and other forms of venture creation with funding: Information on initiatives can be found here: <a href="https://ec.europa.eu/growth/smes/sme-strategy/start-procedures_en">https://ec.europa.eu/growth/smes/sme-strategy/start-procedures_en</a>
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Gründerskolen Norway - Norway School of Entrepreneurship; <a href="https://heinnovate.eu/en/heinnovate-resources/resources/grunderskolen-norway-norway-school-entrepreneurship">https://heinnovate.eu/en/heinnovate-resources/resources/grunderskolen-norway-norway-school-entrepreneurship</a></li> <li>- Support for entrepreneurs through the Centre for Entrepreneurship at the University of Cyprus; <a href="https://heinnovate.eu/sites/default/files/Centre%20for%20Entrepreneurship%20at%20the%20University%20of%20Cyprus.pdf">https://heinnovate.eu/sites/default/files/Centre%20for%20Entrepreneurship%20at%20the%20University%20of%20Cyprus.pdf</a></li> <li>- Junior Enterprise: Preparing and supporting entrepreneurs - The Junior Enterprise concept; <a href="https://heinnovate.eu/en/heinnovate-resources/resources/junior-enterprise-preparing-and-supporting-entrepreneurs">https://heinnovate.eu/en/heinnovate-resources/resources/junior-enterprise-preparing-and-supporting-entrepreneurs</a></li> </ul>
<b>Further reading</b>	<p>Lackus, Martin; Williams Middleton, Karen (2015): Venture Creation Programs: Bridging Entrepreneurship Education and Technology Transfer. In <i>Education &amp; Training</i> 57, pp. 48–73. DOI: 10.1108/ET-02-2013-0013.</p> <p>O'Connor, John; Fenton, Mary; Barry, Almar (2012): Entrepreneurship Education: Ireland's Solution to Economic Regeneration? In <i>Industry and Higher Education</i> 26, pp. 241–249. DOI: 10.5367/ihe.2012.0097.</p> <p>Ortiz-Medina, L.; Fernandez-Ahumada, E.; Lara-Vlez, P.; Taguas, E. V.; Gallardo-Cobos, R.; del Campillo, M. C.; Guerrero-Ginel, J. E. (2016): Designing an Accompanying Ecosystem to Foster Entrepreneurship among Agronomic and Forestry Engineering Students. Opinion and Commitment of University Lecturers. In <i>European Journal of Engineering Education</i> 41, pp. 393–410. DOI: 10.1080/03043797.2015.1079815.</p> <p>Teixeira, Aurora A. C.; Davey, Todd (2010): Attitudes of Higher Education Students to New Venture Creation: The Relevance of Competencies and Contextual Factors. In <i>Industry and Higher Education</i> 24, pp. 323–341. DOI: 10.5367/ihe.2010.0005.</p> <p>Williams, Perri; Fenton, Mary (2013): Towards a Good Practice Model for an Entrepreneurial HEI: Perspectives of Academics, Enterprise Enablers and Graduate Entrepreneurs. In <i>Industry and Higher Education</i> 27, pp. 499–506. DOI: 10.5367/ihe.2013.0183.</p>
<b>Links to further Tiles</b>	<ul style="list-style-type: none"> <li>➔ Change of curricula</li> <li>➔ Training teachers</li> <li>➔ Create new (infra)structures for entrepreneurship</li> </ul>

## Interventions

### Tile 3: Change of Curricula

Title	Change of Curricula
<p><b>Introduction/ Background</b></p>	<p>There are two major forms that link to the change for curricula towards more entrepreneurship: Either the training becomes <i>integrated into the already existing curricula</i> (frequently as new learning outcomes), or institutions develop <i>entrepreneurship modules</i> that become electives or even mandatory in some study programmes.</p> <p>Frequently, ideas about entrepreneurship education differ strongly between the technical or natural sciences and the arts, humanities, and social sciences. For the latter disciplines, the papers also report less acceptance or a negative image of entrepreneurship education. Therefore, irrespective of the chosen form of entrepreneurship education institutions face the challenge of creating a general and shared understanding of entrepreneurship education (Dinning, 2019).</p> <p>The integration of skill training requires the higher education institutions to develop these competences in their teaching staff, make investments in building the infrastructure (for example, such as a physical centre for entrepreneurship education), and create or enhance their ecosystem (regional) economic sector.</p> <p>Also, when integrating the training of entrepreneurship competencies in existing curricula, teachers report that they often don't know how to do this or link it with academic skills training. Due to the differences in perception of value and content of entrepreneurial education, these institutions often face the challenge to stimulate and nurture motivation among their staff and students. Also, measuring the impact, i.e., how students benefit from the training in their later professional careers, is mentioned as a challenge</p>
<p><b>The goal</b></p>	<ul style="list-style-type: none"> <li>- Integrating entrepreneurship education in already existing curricula mainstreams entrepreneurship across the institution. The major goal is to create entrepreneurial skills in students.</li> <li>- Entrepreneurship modules frequently are self-standing education units that student can choose as electives or need to attend as a mandatory part of their degree programmes. Entrepreneurship modules often simulate or support the start-up of a company (-&gt;student entrepreneurs). In these modules students learn basic principles of running a business, writing a business plan, and starting the company virtually or in real life. Also, internships or collaboration projects with companies in the institution's ecosystem can be integrated.</li> </ul>

Title	Change of Curricula
<b>Examples of interventions at institutional level</b>	<ul style="list-style-type: none"> <li>- Integrating entrepreneurship education in existing curricula can use large and small-scale interventions. Large-scale interventions foremost include the change of the curricula through e.g., the definition of additional learning outcomes. Small-scale interventions include the implementation of (new) didactical methods or tools such as serious games or case studies.</li> <li>- Setting up entrepreneurship modules is more complex process, it involves all steps related to developing new modules or programmes, including quality assurance and accreditation processes. Frequently, entrepreneurship modules have been established by business schools.</li> </ul> <p>In any case, when setting up entrepreneurship education several stakeholders (students, teachers, business partners etc.), objectives, (innovative) pedagogies should be considered. The paper of Maritz and Brown (2013) provides a frameworks that list elements that are crucial in the development of entrepreneurship education programmes.</p>
<b>Other relevant resources</b>	<ul style="list-style-type: none"> <li>- OECD: Entrepreneurship in Education, What, Why, When, How; <a href="https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf">https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf</a></li> <li>- European University Association: Meeting skills and employability demands <a href="https://eua.eu/downloads/publications/eua%20tpg%20report_meeting%20skills%20and%20employability%20demands.pdf">https://eua.eu/downloads/publications/eua%20tpg%20report_meeting%20skills%20and%20employability%20demands.pdf</a></li> </ul>
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Technical University of Kosice, Slovakia: Extracurricular entrepreneurship education activities and start-up coaching within the region; <a href="https://heinnovate.eu/sites/default/files/technical_university_of_kosice_extra-curricular_entrepreneurship_education_activities_and_start-up_coaching_within_the_region.pdf">https://heinnovate.eu/sites/default/files/technical_university_of_kosice_extra-curricular_entrepreneurship_education_activities_and_start-up_coaching_within_the_region.pdf</a></li> </ul>
<b>Further reading</b>	<p>Clements, Mike (2012): Contribution of the SPEED Programme to the Enhancement of an Enterprise Culture in a UK University. In <i>Industry and Higher Education</i> 26, pp. 101–106. DOI: 10.5367/ihe.2012.0088.</p> <p>Coleman, Maebh; Hamouda, Angela; Cormican, Kathryn (2010): The Accelerating Campus Entrepreneurship (ACE) Initiative: Creating Entrepreneurial Graduates for Ireland. In <i>Industry and Higher Education</i> 24, pp. 443–454. DOI: 10.5367/ihe.2010.0011.</p> <p>Dinning, Track (2019): Articulating Entrepreneurial Competencies in the Undergraduate Curricular. In <i>Education &amp; Training</i> 61, pp. 432–444. DOI: 10.1108/ET-09-2018-0197.</p> <p>Maritz, Alex; Brown, Christopher R. (2013): Illuminating the Black Box of Entrepreneurship Education Programs: Education &amp; Training (55). In <i>Education &amp; Training</i>, pp. 234–252.</p>



<b>Title</b>	<b>Change of Curricula</b>
	Murray, Alan (2019): The Role of Practical Assessment in the Delivery of Successful Enterprise Education. In <i>Education &amp; Training</i> 61, pp. 413–431. DOI: 10.1108/ET-10-2018-0216.
<b>Links to further Tiles</b>	<ul style="list-style-type: none"> <li>➔ Stimulate staff motivation (7)</li> <li>➔ Connect to students intentions (8)</li> <li>➔ Establish internal and external ecosystems (9)</li> </ul>

#### Tile 4: Train teachers

<b>Title</b>	<b>Train teachers</b>
<b>Introduction/ Background</b>	<p>When discussing interventions for entrepreneurial teaching and learning these are mostly interventions that create benefits or skills for students. Interventions for teachers, in particular training teachers for entrepreneurship education is less often addressed.</p> <p>However, teachers and their qualifications are crucial for entrepreneurship education. Several studies report that when higher education institutions started to implement entrepreneurship education academic teachers criticized that they do not have sufficient knowledge about it or lack entrepreneurial skills themselves. To some, this situation hindered sufficient engagement.</p>
<b>The goal</b>	Interventions for teacher training aim at creating teaching skills in teachers that enable them to engage in entrepreneurial teaching. These skills are thus more than just entrepreneurial knowledge but include skills to teach entrepreneurship, liaise with the (regional) business sectors and to support student in becoming entrepreneurs.
<b>Examples of interventions at institutional level</b>	Interventions that aim at teachers can include measures to train teaching staff regards entrepreneurship competencies in their disciplinary area. This training can include a twofold approach: first, it can create the teachers' entrepreneurship competencies and second, it refers to enhancing their skills in integrating entrepreneurial training in their teaching. Studies on teacher training reveal that these interventions appear to be more self-initiated by staff rather than an intervention planned by the institution (Murray, 2019; Thom, 2017). However, interventions that aim to train teaching staff often happen as informal learning (for example, in peer learning or professional learning communities) as well as – though less frequently – as formal learning (for example, in (mandatory) didactical courses for young teachers (Terzaroli, 2019).

Title	Train teachers
	To date, there are no instruments that measure entrepreneurial competencies in teachers.
<b>Other relevant resources</b>	<ul style="list-style-type: none"> <li>- Framework for Enterprise and Entrepreneurship Education; <a href="https://www.advance-he.ac.uk/knowledge-hub/framework-enterprise-and-entrepreneurship-education">https://www.advance-he.ac.uk/knowledge-hub/framework-enterprise-and-entrepreneurship-education</a></li> <li>- Entertime: HEInnovate resource to train entrepreneurship educators; <a href="https://heinnovate.eu/en/related-projects/entertime">https://heinnovate.eu/en/related-projects/entertime</a></li> </ul>
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Preparing teachers for entrepreneurial education at University College of Christian Churches for Teacher Education Vienna/Krems, Austria; <a href="https://heinnovate.eu/sites/default/files/Preparing%20teachers%20for%20entrepreneurial%20education%20at%20University%20College%20of%20Christian%20Churches%20for%20Teacher%20Education%20Vienna_Krems-converted.pdf">https://heinnovate.eu/sites/default/files/Preparing%20teachers%20for%20entrepreneurial%20education%20at%20University%20College%20of%20Christian%20Churches%20for%20Teacher%20Education%20Vienna_Krems-converted.pdf</a></li> <li>- Kozminski University, Poland: Developing minds for ambitious entrepreneurship and training teachers at other universities; <a href="https://heinnovate.eu/sites/default/files/kozminski_university_developing_minds_for_ambitious_entrepreneurship_and_training_teachers_at_other_universities.pdf">https://heinnovate.eu/sites/default/files/kozminski_university_developing_minds_for_ambitious_entrepreneurship_and_training_teachers_at_other_universities.pdf</a></li> </ul>
<b>Further reading</b>	<p>Murray, Alan (2019): The Role of Practical Assessment in the Delivery of Successful Enterprise Education. In <i>Education &amp; Training</i> 61, pp. 413–431. DOI: 10.1108/ET-10-2018-0216.</p> <p>Terzaroli, Carlo (2019): Entrepreneurship as a Special Pathway for Employability. In <i>New Directions for Adult and Continuing Education</i> NA, pp. 121–131. DOI: 10.1002/ace.20346.</p> <p>Thom, Marco (2017): The Rough Journey into Arts Entrepreneurship: Why Arts Entrepreneurship Education Is Still in Its Infancy in the UK and Germany. In <i>Education &amp; Training</i> 59, pp. 720–739. DOI: 10.1108/ET-01-2016-0015.</p>
<b>Links to further Tiles</b>	➔ Stimulate staff motivation (7)

**Tile 5 Create new (infra-)structure for entrepreneurship education**

<b>Title</b>	<b>Create new (infra-)structure for entrepreneurship education</b>
<b>Introduction/ Background</b>	<p>Embedding entrepreneurship education in higher education institutions requires adaptations of their structures. This can be understood as creating a special place in the institution that belong to entrepreneurship education, but also to create capacity and knowledge to respond to challenges that are linked to entrepreneurship education. These newly created structures can be physical in terms of buildings as well as non-material artefacts such as new professional roles or departments. These new structures do not need to be part of the creating higher education institution, they can also be units that are autonomous and located at the institution’s organizational boundaries, such as business incubators. Also, new structures can be built at the centre level of the university to support institutional leadership in their attempts to embed entrepreneurship.</p>
<b>The goal</b>	<p>The creation of new infrastructure or the structural interventions aim at enhancing embedding of entrepreneurial teaching and learning.</p>
<b>Examples of interventions at institutional level</b>	<p>With structural interventions, we refer to those activities that aim to alter the organisational structure of higher education institutions. In detail, these changes alter existing or establish new roles, positions or even departments and other organizational units in higher education institutions. At first sight, one would not assume that these interventions would benefit the enhancement of entrepreneurial teaching and learning, as they do not offer teaching and learning. Rather, often these structural changes aim to enable this kind of teaching. Frequent examples are the establishment of a “Centre for Entrepreneurship Education” or of a business incubator (Maritz, 2017; O’Connor et al., 2012; Thom, 2017). Thus, these interventions can be regarded as a further structural differentiation and specialisation in which expert positions aim to support strengthening the entrepreneurial nature of the higher education institution (Ortiz-Medina et al., 2016). Often these are large-scale interventions, which include long-term planning, setting clear objectives or vast investments. Also, when altering existing or creating new organisational structures, institutions must consider the need to legitimise this change internally and create approval among staff and students. This legitimisation can support those new structures to become better integrated into the institution and that its services are used (Maritz, 2017; Maritz &amp; Brown, 2013). In our sample, the outcomes and impacts of these structural interventions are hardly measured (Smith, 2015).</p>

<b>Title</b>	<b>Create new (infra-)structure for entrepreneurship education</b>
<b>Other relevant resources</b>	- EBN –The European Business and Innovation Centre Network, <a href="http://www.ebn.eu">www.ebn.eu</a>
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Support for entrepreneurs through the Centre for Entrepreneurship at the University of Cyprus; <a href="https://heinnovate.eu/sites/default/files/Centre%20for%20Entrepreneurship%20at%20the%20University%20of%20Cyprus.pdf">https://heinnovate.eu/sites/default/files/Centre%20for%20Entrepreneurship%20at%20the%20University%20of%20Cyprus.pdf</a></li> <li>- University of Southern Denmark: IDEA centre for promoting entrepreneurship education across the university; <a href="https://heinnovate.eu/sites/default/files/university_of_southern_idea_centre_for_promoting_entrepreneurship_education_across_the_university.pdf">https://heinnovate.eu/sites/default/files/university_of_southern_idea_centre_for_promoting_entrepreneurship_education_across_the_university.pdf</a></li> <li>- University Rotterdam, Netherlands: Building the Erasmus Centre for Entrepreneurship and advancing corporate entrepreneurship; <a href="https://heinnovate.eu/sites/default/files/university_rotterdam_building_the_erasmus_centre_for_entrepreneurship_and_advancing_corporate_entrepreneurship.pdf">https://heinnovate.eu/sites/default/files/university_rotterdam_building_the_erasmus_centre_for_entrepreneurship_and_advancing_corporate_entrepreneurship.pdf</a></li> </ul>
<b>Further reading</b>	<p>Ayyash, Sarah Al; McAdam, Maura; OGorman, Colm (2020): Towards a New Perspective on the Heterogeneity of Business Incubator-Incubation Definitions. In <i>IEEE Trans. Eng. Manage.</i>, pp. 1–15. DOI: 10.1109/TEM.2020.2984169.</p> <p>Maritz, Alex (2017): Illuminating the Black Box of Entrepreneurship Education Programmes: Part 2. In <i>Education &amp; Training</i> 59, pp. 471–482. DOI: 10.1108/ET-02-2017-0018.</p> <p>Ortiz-Medina, L.; Fernandez-Ahumada, E.; Lara-Vlez, P.; Taguas, E. V.; Gallardo-Cobos, R.; del Campillo, M. C.; Guerrero-Ginel, J. E. (2016): Designing an Accompanying Ecosystem to Foster Entrepreneurship among Agronomic and Forestry Engineering Students. Opinion and Commitment of University Lecturers. In <i>European Journal of Engineering Education</i> 41, pp. 393–410. DOI: 10.1080/03043797.2015.1079815.</p> <p>Smith, Kelly (2015): Measuring the Impact of Enterprise Education and Entrepreneurship Support in Higher Education: Can Routinely Collected Data Be of Use? In <i>Industry and Higher Education</i> 29, pp. 493–503. Available online at <a href="http://ezproxy2.utwente.nl/login?url=https://search.ebscohost.com/login.aspx?direct=true&amp;db=eric&amp;AN=EJ1083884&amp;site=ehost-live">http://ezproxy2.utwente.nl/login?url=https://search.ebscohost.com/login.aspx?direct=true&amp;db=eric&amp;AN=EJ1083884&amp;site=ehost-live</a> and <a href="http://www.ippublishing.com/ihe.htm">http://www.ippublishing.com/ihe.htm</a>.</p>
<b>Links to further Tiles</b>	<ul style="list-style-type: none"> <li>➔ Sufficient and continuous funding (6)</li> <li>➔ Stimulate staff motivation (7)</li> <li>➔ Connect to students' intentions (8)</li> <li>➔ Establish internal and external ecosystems (9)</li> <li>➔ Investment in infrastructure (10)</li> </ul>

## Input

### Tile 6: Sufficient and continuous funding

Title	Sufficient and continuous funding
<b>Introduction/ Background</b>	As any activity also the provision of entrepreneurial teaching and learning is based on sufficient and continuous funding. The provision of entrepreneurship education might require additional funds compared to other, more traditional provisions. This is in particular true when new structures have to be established or capacity among teachers need to be build.
<b>Relevance of input</b>	Sufficient and continuous funding is indispensable for embedding entrepreneurial teaching and learning with a long-term perspective. To secure funding higher education institutions need to diversify their income streams and identify new money streams, e.g., through stronger collaboration with the business sector or establishing fund raising.
<b>Examples of interventions at institutional level</b>	<p>Besides staff, funding is an essential input for entrepreneurship education. In the studies we analysed, two major forms are mentioned. First, the funding includes institutional funds (such as first money stream), and second, funding from additional grants such as seed money from funding agencies or other (governmental) bodies. Irrespectively of the source of funding, studies addressing funding as crucial input point out that continuous funding is most relevant for a sustainable impact of entrepreneurship education. While additional funds are an essential factor for kicking off entrepreneurship education projects, they also bear the risk that interventions do not continue once the funding runs out.</p> <p>Papers also mention that entrepreneurship education involves more than staff costs and expenses for learning materials. In other words, funding crosscuts all other inputs as infrastructure and the maintenance of ecosystems also create these (Bridge et al., 2010; Maritz, 2017; Maritz &amp; Brown, 2013)</p>
<b>Other relevant resources</b>	<ul style="list-style-type: none"> <li>- Financially sustainable universities ii - European universities diversifying income streams; <a href="https://eua.eu/downloads/publications/financially%20sustainable%20universities%20ii%20-%20european%20universities%20diversifying%20income%20streams.pdf">https://eua.eu/downloads/publications/financially%20sustainable%20universities%20ii%20-%20european%20universities%20diversifying%20income%20streams.pdf</a></li> </ul>
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- THE ACE initiative (Accelerating Campus Entrepreneurship), Ireland; <a href="https://heinnovate.eu/sites/default/files/The%20ACE%20Initiative_Ireland.pdf">https://heinnovate.eu/sites/default/files/The%20ACE%20Initiative_Ireland.pdf</a></li> </ul>

<b>Title</b>	<b>Sufficient and continuous funding</b>
<b>Further reading</b>	McClure, Kevin R. (2016): Building the Innovative and Entrepreneurial University: An Institutional Case Study of Administrative Academic Capitalism. In <i>The Journal of Higher Education</i> 87 (4), pp. 516–543. DOI: 10.1080/00221546.2016.11777412.
<b>Links to further Tiles</b>	➔ Lack of funding/time (12)

### Tile 7: Stimulate staff motivation

<b>Title</b>	<b>Stimulate staff motivation</b>
<b>Introduction/ Background</b>	A shared understanding of the content and purpose of entrepreneurship education is crucial as it secures motivation and support of staff. Especially for teaching staff, the objectives of entrepreneurship education must fit well with their professional values. Sometimes institutional requirements to integrate entrepreneurship training in the teaching are not well accepted by staff. When there is a mismatch between the teachers' perceptions of what skills should be built and the entrepreneurial skill sets defined in the institutional requirements. This mismatch can result in teachers who only superficially address entrepreneurship.
<b>Relevance of input</b>	Research results have already pointed out that defining and communicating the value of entrepreneurship training is fundamental. As for any organisational change, the involvement and support of leadership is crucial to creating commitment among staff and students (Bin Yusoff, Mohd Nor Hakim et al., 2015). However, as higher education institutions frequently host several disciplinary cultures, institutional leadership needs to address these cultural differences in a sensitive manner. Describing entrepreneurial skills should avoid being dominated by one discipline. Rather institutional definitions should be either general or diversified to accommodate the cultural diversity. The involvement of the staff when defining entrepreneurial values also helps to secure their support (Clements, 2012). Concerning the students and further users of entrepreneurship training, such as business partners in the regions. A few papers report that the design of entrepreneurship curricula must also consider their demands to stimulate their interest (Mets et al., 2017).
<b>Examples of interventions at institutional level</b>	Concerning the motivations of teaching staff (and students), studies investigated a few incentives. While the provisions of time and financial incentives can be helpful, it turned out that making new experiences is a strong motivator in the research. Interventions that gave teachers and

Title	Stimulate staff motivation
	<p>students new to entrepreneurship training the opportunity to learn about it and continue in this area were very effective. Here, it is argued that the newness of the knowledge, experiences and contacts made is the incentive (Ghina et al., 2014; Mkimurto-Koivumaa &amp; Belt, 2016; Thom, 2017). However, we would like to note that this incentive might preferably unfold in well-organised learning opportunities.</p> <p>Some studies also point out that teachers sometimes are not well prepared for teaching entrepreneurial skills. The provision of training can be beneficial for those teachers, especially when it includes new or innovative teaching practices or the opportunity to collaborate with other teachers (Terzaroli, 2019)</p>
<p><b>Other relevant resources</b></p>	<p>- n/a</p>
<p><b>Links to selected HEInnovate case studies</b></p>	<ul style="list-style-type: none"> <li>- Leadership and governance for an entrepreneurial culture at Aalto University; <a href="https://heinnovate.eu/sites/default/files/Leadership%20and%20governance_Aalto%20University_Finland.pdf">https://heinnovate.eu/sites/default/files/Leadership%20and%20governance_Aalto%20University_Finland.pdf</a></li> <li>- Entrepreneurial Behaviours and Organisation Culture – A Case Study; <a href="https://heinnovate.eu/sites/default/files/Entrepreneurial%20behaviours%20and%20organisation%20culture_Dunlalk%20IoT_Ireland.pdf">https://heinnovate.eu/sites/default/files/Entrepreneurial%20behaviours%20and%20organisation%20culture_Dunlalk%20IoT_Ireland.pdf</a></li> </ul>
<p><b>Further reading</b></p>	<p>Clements, Mike (2012): Contribution of the SPEED Programme to the Enhancement of an Enterprise Culture in a UK University. In <i>Industry and Higher Education</i> 26, pp. 101–106. DOI: 10.5367/ihe.2012.0088.</p> <p>Ghina, Astri; Simatupang, Togar M.; Gustomo, Aurik (2014): A Systematic Framework for Entrepreneurship Education within a University Context. In <i>International Education Studies</i> 7.</p> <p>Mets, Tnis; Kozlinska, Inna; Raudsaar, Mervi (2017): Patterns in Entrepreneurial Competences as the Perceived Learning Outcomes of Entrepreneurship Education: The Case of Estonian HEIs. In <i>Industry and Higher Education</i> 31, pp. 23–33. DOI: 10.1177/0950422216684061.</p> <p>Mkimurto-Koivumaa, Soili; Belt, Pekka (2016): About, for, in or through Entrepreneurship in Engineering Education. In <i>European Journal of Engineering Education</i> 41, pp. 512–529. DOI: 10.1080/03043797.2015.1095163.</p> <p>Terzaroli, Carlo (2019): Entrepreneurship as a Special Pathway for Employability. In <i>New Directions for Adult and Continuing Education</i> NA, pp. 121–131. DOI: 10.1002/ace.20346.</p> <p>Thom, Marco (2017): The Rough Journey into Arts Entrepreneurship: Why Arts Entrepreneurship Education Is Still in Its Infancy in the UK and Germany. In <i>Education &amp; Training</i> 59, pp. 720–739. DOI: 10.1108/ET-01-2016-0015.</p>

**Tile 8: Connect to students' intentions**

Title	Connect to students' intentions
<b>Introduction/ Background</b>	Students' entrepreneurial intentions are an important variable for the design of entrepreneurial teaching and learning at a higher education institution. Some students already developed ideas about starting their own company before attending an entrepreneurial course or seeking institutional support for their plans. The design of entrepreneurial teaching however includes besides programmes or modules on entrepreneurship also regulations, culture and the provision of information. Students who perceive the different aspects of the entrepreneurial teaching and learning design, the more likely is that their entrepreneurial intentions will realise as action, e.g., as founding a start-up business.
<b>Relevance of input</b>	Considering students' intentions in the design of entrepreneurial teaching and learning is a must for higher education institutions. Cultures, regulations or information that is found to be unclear, too bureaucratic or irrelevant will hinder students to venture into their own businesses or develop an entrepreneurial mindset.
<b>Examples of interventions at institutional level</b>	To better connect to students' entrepreneurial intentions higher education institutions can – besides surveying these intentions – create a climate for entrepreneurship that support students' intentions. Oftedal et al. (2017) mention the creation of a positive entrepreneurial cultures, including the establishment of a positive image of the entrepreneur, media campaigns on entrepreneurship, including events and business plan competitions can also be helpful. Encouraging students with concrete plans, and also clear regulations for financial support for start-up companies are further instrument to connect to students' intentions.
<b>Other relevant resources</b>	- n/a
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Supporting students' business ideas at the University of Belgrade's Startup Centar, Serbia; <a href="https://heinnovate.eu/sites/default/files/HEInnovate_Belgrade.pdf">https://heinnovate.eu/sites/default/files/HEInnovate_Belgrade.pdf</a></li> <li>- Engaging students and staff in knowledge exchange Warsaw University of Technology; <a href="https://heinnovate.eu/sites/default/files/engaging_students_and_staff_in_knowledge_exchange_at_warsaw_university_of_technology.pdf">https://heinnovate.eu/sites/default/files/engaging_students_and_staff_in_knowledge_exchange_at_warsaw_university_of_technology.pdf</a></li> </ul>



<b>Title</b>	<b>Connect to students' intentions</b>
<b>Further reading</b>	Oftedal, Elin Merethe; Iakovleva, Tatiana A.; Foss, Lene (2018): University Context Matter: An Institutional Perspective on Entrepreneurial Intentions of Students. In <i>Education &amp; Training</i> 60, pp. 873–890. DOI: 10.1108/ET-06-2016-0098.
<b>Links to further Tiles</b>	➔ Lack of entrepreneurial culture (11)

### Tile 9: Establish internal and external ecosystems

<b>Title</b>	<b>Establish internal and external ecosystems</b>
<b>Introduction/ Background</b>	Entrepreneurship ecosystems are all social networks that are linked to a higher education institution. These networks can develop in very different formats, either as external ecosystems, i.e., involving partners and stakeholders that are not members of the institution and internal ecosystems, which involve the institutions' members. A shared characteristic of the ecosystems is that these are not formal structures but are mostly informally organised. As an ecosystem, the networks support cultivating entrepreneurship in a higher education institution and its closer (regional) environment.
<b>Relevance of input</b>	The establishment, maintenance and extension of internal and external entrepreneurship ecosystems are another input that is crucial for entrepreneurship education. External networks bring relevant information on skill demands and opportunities for collaboration to higher education institutions (Ortiz-Medina et al., 2016). External networks create a closer link between the institution and its region (Lackus & Williams Middleton, 2015). Some entrepreneurship education formats are also dependent on involving external stakeholders as they can provide students with more real experiences than the experiences collected from virtual learning experiments (Gilbert, 2012). Also, teachers with entrepreneurship experiences can be recruited from these networks. Internal ecosystems, such as professional learning communities of teachers, can also provide value to the institution (Ghina et al., 2014). These networks can strengthen teachers' motivation, support the development, and use educational innovations to enhance entrepreneurship education. However, while ecosystems are an important input to entrepreneurship education, their establishment and maintenance require resources such as staff, funding and infrastructure itself (Ortiz-Medina et al., 2016).

<b>Title</b>	<b>Establish internal and external ecosystems</b>
<b>Examples of interventions at institutional level</b>	tbf
<b>Other relevant resources</b>	- The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship; <a href="http://www.innovationamerica.us/images/stories/2011/The-entrepreneurship-ecosystem-strategy-for-economic-growth-policy-20110620183915.pdf">http://www.innovationamerica.us/images/stories/2011/The-entrepreneurship-ecosystem-strategy-for-economic-growth-policy-20110620183915.pdf</a>
<b>Links to selected HEInnovate case studies</b>	- Knowledge exchange and collaboration_Examples from five Hungarian HEIs; <a href="https://heinnovate.eu/sites/default/files/Knowledge%20exchange%20and%20collaboration_Examples%20from%20five%20Hungarian%20HEIs.pdf">https://heinnovate.eu/sites/default/files/Knowledge%20exchange%20and%20collaboration_Examples%20from%20five%20Hungarian%20HEIs.pdf</a> - Linz University, Austria: Inspiring teaching and a support network for academic entrepreneurs; <a href="https://heinnovate.eu/sites/default/files/linz_university_inspiring_teaching_and_a_support_network_for_academic_entrepreneurs.pdf">https://heinnovate.eu/sites/default/files/linz_university_inspiring_teaching_and_a_support_network_for_academic_entrepreneurs.pdf</a>
<b>Further reading</b>	Ghina, Astri; Simatupang, Togar M.; Gustomo, Aurik (2014): A Systematic Framework for Entrepreneurship Education within a University Context. In <i>International Education Studies</i> 7.  Gilbert, David H. (2012): From Chalk and Talk to Walking the Walk: Facilitating Dynamic Learning Contexts for Entrepreneurship Students in Fast-Tracking Innovations. In <i>Education &amp; Training</i> 54, pp. 152–166. DOI: 10.1108/00400911211210260.  Lackus, Martin; Williams Middleton, Karen (2015): Venture Creation Programs: Bridging Entrepreneurship Education and Technology Transfer. In <i>Education &amp; Training</i> 57, pp. 48–73. DOI: 10.1108/ET-02-2013-0013.  Ortiz-Medina, L.; Fernandez-Ahumada, E.; Lara-Vlez, P.; Taguas, E. V.; Gallardo-Cobos, R.; del Campillo, M. C.; Guerrero-Ginel, J. E. (2016): Designing an Accompanying Ecosystem to Foster Entrepreneurship among Agronomic and Forestry Engineering Students. Opinion and Commitment of University Lecturers. In <i>European Journal of Engineering Education</i> 41, pp. 393–410. DOI: 10.1080/03043797.2015.1079815.
<b>Links to further Tiles</b>	➔

**Tile 10: Investment in Infrastructure**

Title	Investment in infrastructure
<b>Introduction/ Background</b>	<p>Creating a physical space such as a materialised Centre for Entrepreneurship provides a strong message that entrepreneurship education is part of the institution. These physical manifestations can also provide space for the HEI and the external ecosystem. Also, for those institutions supporting students to venture into business, these centres can provide affordable office space and help them creating their network within the institutions and the external ecosystem. Building physical infrastructure for entrepreneurship centres can mean huge investments for the institutions. Therefore, it is crucial to consider if the investment is fit for purpose to create value from these investments. I.e., when planning such centres or similar, the location (on-site or close to campus), size and (technical) equipment must be designed carefully. (Bin Yusoff, Mohd Nor Hakim et al., 2015; Hyclak &amp; Barakat, 2010).</p>
<b>Relevance of input</b>	<p>Providing space for entrepreneurship education is relevant. However, the establishment of an entrepreneurial culture or spirit can contribute to legitimize huge investments.</p>
<b>Examples of interventions at institutional level</b>	<p>With structural interventions, we refer to those activities that aim to alter the organisational structure of higher education institutions. In detail, these changes alter existing or establish new roles, positions or even departments and other organizational units in higher education institutions. At first sight, one would not assume that these interventions would benefit the enhancement of entrepreneurial teaching and learning, as they do not offer teaching and learning. Rather, often these structural changes aim to enable this kind of teaching. Frequent examples are the establishment of a “Centre for Entrepreneurship Education” or of a business incubator (Maritz, 2017; O'Connor et al., 2012; Thom, 2017). Thus, these interventions can be regarded as a further structural differentiation and specialisation in which expert positions aim to support strengthening the entrepreneurial nature of the higher education institution (Ortiz-Medina et al., 2016). Often these are large-scale interventions, which include long-term planning, setting clear objectives or vast investments. Also, when altering existing or creating new organisational structures, institutions must consider the need to legitimise this change internally and create approval among staff and students. This legitimisation can support those new structures to become better integrated into the institution and that its services are used (Maritz, 2017; Maritz &amp; Brown, 2013). In our sample, the outcomes and impacts of these structural interventions are hardly measured (Smith, 2015).</p>

Title	Investment in infrastructure
Other relevant resources	- n/a
Links to selected HEInnovate case studies	<ul style="list-style-type: none"> <li>- Support for entrepreneurs through the Centre for Entrepreneurship at the University of Cyprus; <a href="https://heinnovate.eu/sites/default/files/Centre%20for%20Entrepreneurship%20at%20the%20University%20of%20Cyprus.pdf">https://heinnovate.eu/sites/default/files/Centre%20for%20Entrepreneurship%20at%20the%20University%20of%20Cyprus.pdf</a></li> <li>- University of Southern Denmark: IDEA centre for promoting entrepreneurship education across the university; <a href="https://heinnovate.eu/sites/default/files/university_of_southern_idea_centre_for_promoting_entrepreneurship_education_across_the_university.pdf">https://heinnovate.eu/sites/default/files/university_of_southern_idea_centre_for_promoting_entrepreneurship_education_across_the_university.pdf</a></li> <li>- University Rotterdam, Netherlands: Building the Erasmus Centre for Entrepreneurship and advancing corporate entrepreneurship; <a href="https://heinnovate.eu/sites/default/files/university_rotterdam_building_the_erasmus_centre_for_entrepreneurship_and_advancing_corporate_entrepreneurship.pdf">https://heinnovate.eu/sites/default/files/university_rotterdam_building_the_erasmus_centre_for_entrepreneurship_and_advancing_corporate_entrepreneurship.pdf</a></li> </ul>
Further reading	<p>Bin Yusoff, Mohd Nor Hakim; Zainol, Fakhrul Anwar; Bin Ibrahim, Mohamed Dahlan (2015): Entrepreneurship Education in Malaysia's Public Institutions of Higher Learning--A Review of the Current Practices. In <i>International Education Studies</i> 8, pp. 17–28.</p> <p>Hyclak, Thomas; Barakat, Shima (2010): Entrepreneurship Education in an Entrepreneurial Community. In <i>Industry and Higher Education</i> 24, pp. 475–486. DOI: 10.5367/ihe.2010.0018.</p>
Links to further Tiles	<ul style="list-style-type: none"> <li>➔ Lack of funding/time (12)</li> <li>➔ Legal/organisational obstacles (13)</li> <li>➔ Lack entrepreneurial experience/knowledge (15)</li> </ul>

**Barriers and Solutions**

**Tile 11: Lack of entrepreneurial culture**

<b>Title</b>	<b>Lack of entrepreneurial culture</b>
<b>Introduction/ Background</b>	A lack of entrepreneurial culture can have an impact on the motivation of staff and the entrepreneurial intentions of students.
<b>The problem</b>	<p>Especially for teaching staff, the objectives and values of entrepreneurship education must fit well with their professional values. Sometimes institutional requirements to integrate entrepreneurship training in the teaching are not well accepted by staff, in particular when there is a mismatch between the teachers' perceptions of what skills should be built and the entrepreneurial skill sets defined in the institutional requirements. This mismatch can result in teachers who only superficially address entrepreneurship.</p> <p>Students who perceive institutional regulations, values and support negatively often refrain from their entrepreneurial intentions, i.e., they less frequently transform their ideas into a business start-up or do not develop an entrepreneurial attitude.</p>
<b>Solutions at institutional level</b>	<p>Communication is key to achieving a shared entrepreneurial culture. Studies point out that defining and communicating the value of entrepreneurship training is fundamental. As for any organisational change, the involvement and support of leadership are crucial to creating commitment among staff and students (Bin Yusoff, Mohd Nor Hakim et al., 2015). However, as higher education institutions frequently host several disciplinary cultures, institutional leadership needs to address these cultural differences in a sensitive manner. Describing entrepreneurial skills should avoid being dominated by one discipline. Rather institutional definitions should be either general or diversified to accommodate the cultural diversity. The involvement of the staff when defining entrepreneurial values also helps to secure their support (Clements, 2012). Concerning the students and further users of entrepreneurship training, such as business partners in the regions. A few papers report that the design of entrepreneurship curricula must also consider their demands to stimulate their interest (Mets et al., 2017).</p> <p>Incentives can stimulate the motivation and intentions of teachers and students. Time and financial incentives can be helpful, but also the opportunity of making new experiences turned out to be a strong motivator. Interventions that gave teachers and students who were new to entrepreneurship training the opportunity to learn about it and continue in this area were very effective. Here, it is argued that the newness of the knowledge, experiences and contacts made is the incentive (Ghina et al., 2014; Mkimurto-Koivumaa &amp; Belt, 2016; Thom, 2017).</p>

<b>Title</b>	<b>Lack of entrepreneurial culture</b>
	Finally training teachers for entrepreneurial education can ease their uncertainties and feelings of insufficient preparation. The provision of training can be beneficial when it includes new or innovative teaching practices or the opportunity to collaborate with other teachers (Terzaroli, 2019)
<b>Other relevant resources</b>	- Entertime: HEInnovate resource to train entrepreneurship educators; <a href="https://heinnovate.eu/en/related-projects/entertime">https://heinnovate.eu/en/related-projects/entertime</a>
<b>Links to selected HEInnovate case studies</b>	- Leadership and governance for an entrepreneurial culture at Aalto University; <a href="https://heinnovate.eu/sites/default/files/Leadership%20and%20governance_Aalto%20University_Finland.pdf">https://heinnovate.eu/sites/default/files/Leadership%20and%20governance_Aalto%20University_Finland.pdf</a> - Entrepreneurial Behaviours and Organisation Culture – A Case Study; <a href="https://heinnovate.eu/sites/default/files/Entrepreneurial%20behaviours%20and%20organisation%20culture_Dunlalk%20IoT_Ireland.pdf">https://heinnovate.eu/sites/default/files/Entrepreneurial%20behaviours%20and%20organisation%20culture_Dunlalk%20IoT_Ireland.pdf</a>
<b>Further reading</b>	Bin Yusoff, Mohd Nor Hakim; Zainol, Fakhrul Anwar; Bin Ibrahim, Mohamed Dahlan (2015): Entrepreneurship Education in Malaysia's Public Institutions of Higher Learning--A Review of the Current Practices. In <i>International Education Studies</i> 8, pp. 17–28.  Clements, Mike (2012): Contribution of the SPEED Programme to the Enhancement of an Enterprise Culture in a UK University. In <i>Industry and Higher Education</i> 26, pp. 101–106. DOI: 10.5367/ihe.2012.0088.  Ghina, Astri; Simatupang, Togar M.; Gustomo, Aurik (2014): A Systematic Framework for Entrepreneurship Education within a University Context. In <i>International Education Studies</i> 7.  Mets, Tnis; Kozlinska, Inna; Raudsaar, Mervi (2017): Patterns in Entrepreneurial Competences as the Perceived Learning Outcomes of Entrepreneurship Education: The Case of Estonian HEIs. In <i>Industry and Higher Education</i> 31, pp. 23–33. DOI: 10.1177/0950422216684061.  Mkimurto-Koivumaa, Soili; Belt, Pekka (2016): About, for, in or through Entrepreneurship in Engineering Education. In <i>European Journal of Engineering Education</i> 41, pp. 512–529. DOI: 10.1080/03043797.2015.1095163.  Terzaroli, Carlo (2019): Entrepreneurship as a Special Pathway for Employability. In <i>New Directions for Adult and Continuing Education</i> NA, pp. 121–131. DOI: 10.1002/ace.20346.  Thom, Marco (2017): The Rough Journey into Arts Entrepreneurship: Why Arts Entrepreneurship Education Is Still in Its Infancy in the UK and Germany. In <i>Education &amp; Training</i> 59, pp. 720–739. DOI: 10.1108/ET-01-2016-0015.
<b>Links to further Tiles</b>	➔ n/a

**Tile 12: Lack of funding**

Title	Lack of funding
<b>Introduction/ Background</b>	The implementation and enhancement of entrepreneurial teaching and learning require institutional investments. When planning their investments, institutions need to sensitively estimate how much resources such as staff, funding, infrastructure, and ecosystems must be invested.
<b>The problem</b>	A frequent barrier for entrepreneurial teaching and learning projects is that no further funding is available once the project ended. Often promising initiatives then come to an end. Securing resources and continuing projects is often dependent on whether the project can show if it has achieved the set goals. (Bin Yusoff, Mohd Nor Hakimin et al., 2015; Ghina et al., 2014; Maritz & Brown, 2013).
<b>Solutions at institutional level</b>	Thus, projects that monitor their outcomes and impact from their start might be more likely to display their added value for the institution. Their proven impact might also increase their chances for continuation.  Diversifying income resources and raising funds from the business sector, regional environment, or alumni already during projects or initiatives can secure their continuation after the initial funding runs out.
<b>Other relevant resources</b>	Pruvot, Enora Bennetot; Estermann, Thomas (2012): European Universities Diversifying Income Streams. In Adrian Curaj (Ed.): European Higher Education at the Crossroads. Between the Bologna Process and National Reforms. With assistance of Peter Scott, Lesley Wilson, Lazăr Vlasceanu. 1st ed. Dordrecht: Springer Netherlands, pp. 709–726. DOI: 10.1007/978-94-007-3937-6_38.
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Measuring the Impact at the University of Twente; <a href="https://heinnovate.eu/en/heinnovate-resources/resources/measuring-impact-university-twente">https://heinnovate.eu/en/heinnovate-resources/resources/measuring-impact-university-twente</a></li> <li>- Autonomous University of Barcelona - Measuring the impact; <a href="https://heinnovate.eu/en/heinnovate-resources/resources/autonomous-university-barcelona-measuring-impact">https://heinnovate.eu/en/heinnovate-resources/resources/autonomous-university-barcelona-measuring-impact</a></li> </ul>
<b>Further reading</b>	Etzkowitz, Henry (2013): Anatomy of the entrepreneurial university. In <i>Social Science Information</i> 52 (3), pp. 486–511. DOI: 10.1177/0539018413485832.

<b>Title</b>	<b>Lack of funding</b>
	Dahlan, Ahmad; Ibrahim, Jamaludin; Jalaldeen, Mohamed; Mohajir, Mohammed (2020): Redesign "University of the Future" Conceptual Business Model: Sustainability and Staying Relevant in the Digital Age. In <i>Journal of Information Systems and Digital Technologies</i> 2 (1), pp. 47–59, checked on 4/20/2021.
<b>Links to further Tiles</b>	→ n/a

### Tile 13: Legal and organisational obstacles

<b>Title</b>	<b>Legal and organisational obstacles</b>
<b>Introduction/ Background</b>	Legal and organisational obstacles to implementing and enhancing entrepreneurship education can involve bureaucratic hurdles that stand in the way for university-business collaboration, legal issues to quality assurance and accreditation of programmes, data security and intellectual property rights. These problems mostly root in the different logics of university and business organisation. While the first has to apply regulations on public funding and serve the public good, the latter mostly orient to markets and profitability.
<b>The problem</b>	<p>Institutional regulations can stand in the way of implementing entrepreneurship education. These regulations can, among others, include:</p> <ul style="list-style-type: none"> <li>- Funding problems, while there might be sufficient resources available, institutions might be restricted to spend the funds on assets related to entrepreneurship education, e.g., provision of seed money for students' business start-ups or investing in infrastructure that is not directly linked to educational or research functions.</li> <li>- Funding regulations: Incentives for academic staff might not stimulate their engagement of entrepreneurship education or entrepreneurship as such. E.g. regulations for promotion might put too much focus on publications, while not recognising educational achievements or the development of business ideas.</li> <li>- Quality assurance: Integrating entrepreneurship education in curricula and setting up special entrepreneurship programmes eventually requires that programmes must renew or undertake the full accreditation procedure.</li> <li>- Data security and intellectual property rights: Both can hinder university-business collaboration as students might not be able to</li> </ul>



Title	Legal and organisational obstacles
	<p>access data they need for their studies. Also, the exploitation of innovations that were developed in entrepreneurship education might be restricted/limited.</p> <ul style="list-style-type: none"> <li>- Legal issues, involving the insurance of students might limit their chances to do internships and work in industry premises.</li> </ul>
<b>Solutions at institutional level</b>	<p>The implementation and enhancement of entrepreneurship education needs the support of legal and other experts, e.g., for question of quality assurance or funding. Integrating these experts from the start can prevent that implementation is not hindered or blocked when interventions will be implemented.</p> <p>Institutions also need to review their funding regulations and incentives for students and staff. Also, the founding of spin-offs and extra-university structures needs to be considered.</p>
<b>Other relevant resources</b>	n/a
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- University of Roviri I Virgili - Organisational Capacity, people and incentives <a href="https://www.heinnovate.eu/en/heinnovate-resources/resources/university-roviri-i-virgili-organisational-capacity-people-and">https://www.heinnovate.eu/en/heinnovate-resources/resources/university-roviri-i-virgili-organisational-capacity-people-and</a></li> <li>- Utrecht University:Alignment for impact <a href="https://www.heinnovate.eu/sites/default/files/Alignement%20for%20Impact_Utrecht%20University_Netherlands_0.pdf">https://www.heinnovate.eu/sites/default/files/Alignement%20for%20Impact_Utrecht%20University_Netherlands_0.pdf</a></li> </ul>
<b>Further reading</b>	Davey, Todd; Meerman, Arno; Galan Muros, Victoria; Orazbayeva, Balzhan; Baaken, Thomas (2018): The state of university-business cooperation in Europe. Final report. Luxembourg: Publications Office of the European Union.
<b>Links to further Tiles</b>	➔ n/a

**Tile 14: Difficulties establishing networks**

Title	Difficulties establishing networks
<b>Introduction/ Background</b>	Having an external and internal entrepreneurial ecosystem is a crucial factor for implementing and strengthening entrepreneurial teaching and learning (Lackus & Williams Middleton, 2015).
<b>The problem</b>	Research shows that higher education institutions with no external ecosystems or only very few of these networks face problems in achieving good outcomes of entrepreneurial teaching and learning. The lack of external networks often results in a lack of knowledge about what potential employers need as entrepreneurial skills. Further, these institutions are less able to provide their students with internships or collaborative education. It is also more difficult to attract guest teachers with professional experience or provide students and graduates who want to start their own business with contacts in these sectors. The lack of these networks might thus diminish the entrepreneurial learning outcomes for students and their later careers.
<b>Solutions at institutional level</b>	A key solution to this problem is that institutions that plan to engage in entrepreneurial teaching and learning should also assess their performance in the dimension “knowledge transfer and exchange” (with their close environment) when developing their interventions and strategies. In doing so, they can determine if these networks are sufficient for their plans or if they eventually need to be extended. Compiling an inventory of existing contacts, including contacts of staff, can be a first step here. Some institutions also report that they have established professional roles and specialised departments such as knowledge transfer offices and centres for entrepreneurship that maintain these networks and aim to extend them. Thus, investing in the creation of inhouse capacity will embed the institutions in their regions (Clements, 2012; Fenton & Barry, 2011; Williams & Fenton, 2013).
<b>Other relevant resources</b>	- tbc
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Knowledge exchange and collaboration_Examples from five Hungarian HEIs; <a href="https://heinnovate.eu/sites/default/files/Knowledge%20exchange%20and%20collaboration_Examples%20from%20five%20Hungarian%20HEIs.pdf">https://heinnovate.eu/sites/default/files/Knowledge%20exchange%20and%20collaboration_Examples%20from%20five%20Hungarian%20HEIs.pdf</a></li> <li>- Linz University, Austria: Inspiring teaching and a support network for academic entrepreneurs; <a href="https://heinnovate.eu/sites/default/files/linz_university_inspiring_teaching_and_a_support_network_for_academic_entrepreneurs.pdf">https://heinnovate.eu/sites/default/files/linz_university_inspiring_teaching_and_a_support_network_for_academic_entrepreneurs.pdf</a></li> </ul>

Title	Difficulties establishing networks
<b>Further reading</b>	<p>Clements, Mike (2012): Contribution of the SPEED Programme to the Enhancement of an Enterprise Culture in a UK University. In <i>Industry and Higher Education</i> 26, pp. 101–106. DOI: 10.5367/ihe.2012.0088.</p> <p>Fenton, Mary; Barry, Almar (2011): The Efficacy of Entrepreneurship Education: Perspectives of Irish Graduate Entrepreneurs. In <i>Industry and Higher Education</i> 25, pp. 451–460. DOI: 10.5367/ihe.2011.0069.</p> <p>Williams, Perri; Fenton, Mary (2013): Towards a Good Practice Model for an Entrepreneurial HEI: Perspectives of Academics, Enterprise Enablers and Graduate Entrepreneurs. In <i>Industry and Higher Education</i> 27, pp. 499–506. DOI: 10.5367/ihe.2013.0183.</p>
<b>Links to further tiles</b>	→ n/a

#### Tile 15: Lack of entrepreneurial experience and knowledge

Title	Lack of entrepreneurial experience and knowledge
<b>Introduction/ Background</b>	Some higher education institutions are more or less completely new to entrepreneurialism or entrepreneurship education. They need to build up knowledge as well as (infra-)structure(s) so that they can provide high quality entrepreneurship education.
<b>The problem</b>	The establishment of entrepreneurial experience and knowledge in higher education institutions requires them strongly invest in capacity, staff, and structures. A lack of all these resources could have a negative impact on the quality of entrepreneurship education. Also, the retention of entrepreneurial capacity is a challenge for higher education institutions.
<b>Solutions at institutional level</b>	<ul style="list-style-type: none"> <li>- Lack of entrepreneurial capacity among staff – Frequently academic staff does not have extensive knowledge or experience in entrepreneurship or entrepreneurship education. To overcome this lack, higher education institutions can consider creating new positions for staff with experience in both areas. Also, job requirements can be amended by entrepreneurial qualifications when re-filling staff positions.</li> <li>- Providing entrepreneurship courses for staff can also be a suitable instrument to build capacity and experiences among staff. However, staff training needs to consider interests and cultures of disciplines. Training appeared mostly effective when providing opportunities to learn and test new knowledge and techniques.</li> </ul>

Title	<b>Lack of entrepreneurial experience and knowledge</b>
	<ul style="list-style-type: none"> <li>- Training for staff should also include some support for establishing contacts with the business-sector, e.g., through transfer-offices or support the interaction with external stakeholders.</li> <li>- Training for staff might also be provided as internship or establishing collaborations with the business-sector. E.g., collaborative doctoral degrees, where doctoral students collaborate in research and innovation with firms (from their region) while simultaneously studying for their PhD can contribute to increasing entrepreneurship capacity or experience in the higher education institutions.</li> <li>- While training of staff is the most crucial solution, higher education institutions also need to consider the implementation of structures with which the knowledge and capacity is consolidated, i.e., that it is not linked to specific persons and lost once these leave the organisation. Establishing chairs for entrepreneurship or centres for entrepreneurship can support this and can help to ensure that this capacity is permanently anchored in the organisation and can persist independently of individuals.</li> </ul>
<b>Other relevant resources</b>	n/a
<b>Links to selected HEInnovate case studies</b>	<ul style="list-style-type: none"> <li>- Kozminski University, Poland: Developing minds for ambitious entrepreneurship and training teachers at other universities <a href="https://www.heinnovate.eu/sites/default/files/kozminski_university_developing_minds_for_ambitious_entrepreneurship_and_training_teachers_at_other_universities.pdf">https://www.heinnovate.eu/sites/default/files/kozminski_university_developing_minds_for_ambitious_entrepreneurship_and_training_teachers_at_other_universities.pdf</a></li> </ul>
<b>Further reading</b>	<p>Clements, Mike (2012): Contribution of the SPEED Programme to the Enhancement of an Enterprise Culture in a UK University. In <i>Industry and Higher Education</i> 26, pp. 101–106. DOI: 10.5367/ihe.2012.0088.</p> <p>Fenton, Mary; Barry, Almar (2011): The Efficacy of Entrepreneurship Education: Perspectives of Irish Graduate Entrepreneurs. In <i>Industry and Higher Education</i> 25, pp. 451–460. DOI: 10.5367/ihe.2011.0069.</p> <p>Williams, Perri; Fenton, Mary (2013): Towards a Good Practice Model for an Entrepreneurial HEI: Perspectives of Academics, Enterprise Enablers and Graduate Entrepreneurs. In <i>Industry and Higher Education</i> 27, pp. 499–506. DOI: 10.5367/ihe.2013.0183.</p>
<b>Links to further Tiles</b>	→ n/a

**Disclaimer:**

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.