

## Chapter 2. Applying the HEInnovate framework to higher education in Italy

*This chapter presents the HEInnovate guiding framework and applies all its dimensions to Italy's higher education system and to Italian higher education institutions (HEIs). The aim is to have an all-round discussion of the capacity of higher education (institutions) to engage and create value for the economy and society while fulfilling their teaching and research missions. The chapter illustrates national features, and some selected case studies, in the eight dimensions of the HEInnovate framework, also explaining why Italy chose to focus in particular on a subset of four dimensions for this review. It displays some relevant results of a Leader Survey, a questionnaire that was administered to all Italian HEIs.*

### The HEInnovate guiding framework

In recent decades, the missions and mandates of higher education institutions have become more complex and their activities have broadened, both in OECD countries and emerging economies. HEIs have acquired a pivotal role in national innovation systems and have considerably expanded their research and development (R&D) activities since the 1980s, partly at the expense of public research organisations. In the OECD area, for instance, HEIs' R&D expenditures have increased more rapidly than R&D expenditures in the business and government sectors (OECD, 2017a).

Moreover, the increasing role of HEIs in national innovation systems and their expected contribution to economic growth and to social and cultural development has put an increasing demand on HEIs on knowledge exchange and technology transfer with economic players. This transformation has gone hand in hand with other global trends:

- In many countries, the governance of HEIs has been decentralised. This has often resulted in a greater autonomy combined with shifts in funding towards greater emphasis on performance and competition. This has allowed HEIs to autonomously allocate resources, set strategic targets and shape their own profiles in research and education. Research suggests (Aghion et al., 2010) that the shift towards greater autonomy of HEIs has had a positive impact on HEI performance.
- Globalisation has been affecting the way that HEIs interact and compete at the international level. Increasing participation in international science and innovation networks has enabled greater international exchange and mutual learning in research activities and education practices. It is also, however, leading to increased competition between institutions for attracting and retaining talented students and researchers.
- The changing context for HEIs has put more emphasis to the concepts of the “third mission” and the “entrepreneurial university” (OECD, 2017a; Etzkowitz et al., 2000; Gibb, Coyle and Haskins, 2013; [www.heinnovate.eu](http://www.heinnovate.eu)). The third mission of HEIs refers to all the activities that go beyond the two core missions, i.e. teaching and research. These activities can be very broad and diversified and take place at different geographical scales. As mentioned above, one of the key third mission activities of HEIs is “knowledge exchange” with business, public organisations and society more broadly (OECD, 2007; Goddard, Kempton and Vallance, 2013; OECD, 2017a). This is also a key feature of what is generally known as the entrepreneurial university.

To support policymakers and HEI leaders to make the most of these transformations, the OECD and the European Commission have developed together HEInnovate, a guiding framework to support HEIs in the development of their innovative and entrepreneurial capacities (Box 2.1). HEInnovate encompasses eight dimensions defined, and detailed for Italy, in the next sections of this chapter.

### Box 2.1. Components of the HEInnovate guiding framework

The HEInnovate framework includes three main components:

- **The HEInnovate self-assessment tool.** The self-assessment tool was conceived for individual HEIs who wish to explore and develop their innovative potential. It guides HEIs through a process of understanding, prioritisation and action planning in eight key dimensions (leadership and governance, organisational capacity: funding people and incentives, entrepreneurial teaching and learning, preparing and supporting entrepreneurs, digital transformation and capability, knowledge exchange and collaboration, the internationalised institution and measuring impact). HEInnovate also identifies areas of strengths and weaknesses, opens up discussion and debate on the innovative and entrepreneurial nature of individual HEIs and allows comparing trends over time. The self-assessment tool gives HEIs instant access to results, learning materials and a pool of experts. The results along with all data provided by HEIs remains confidential, the OECD and the European Commission do not access information submitted by users of the HEInnovate self-assessment tool.
- **The HEInnovate country reviews.** Reviews have been developed to provide a national systemic perspective about innovation in national higher education systems. They complement the HEInnovate tool by providing a systemic perspective and taking into account the different roles and features of different HEIs in a national system. HEIs do not operate in isolation but collaborate with their community and compete with other HEIs in the same country (and abroad) in a variety of fashions. The country reviews were developed to capture and assess these complex interactions and dynamics. At the time of writing, country reviews had been completed for the following OECD or European Union (EU) countries: Ireland, Hungary, Austria, the Netherlands, Poland, Bulgaria, Romania and Croatia (OECD/EC, 2019, 2018, 2017 a, b, c).
- **The HEInnovate Policy Learning Network (PLN).** The PLN was established as a platform of peer-learning and policy dialogue among policymakers of the countries participating in HEInnovate country reviews. The participants of the PLN meet and discuss regularly key themes linked to the HEInnovate eight dimensions and relevant for their countries. It is a platform to learn and compare from similar experiences across OECD and EU countries.

*Sources:* OECD/EC (forthcoming), *Supporting Entrepreneurship and Innovation in Higher Education in Austria*, OECD, Paris/EU Brussels; OECD/EU (forthcoming), *Supporting Entrepreneurship and Innovation in Higher Education in Croatia*, OECD, Paris/EU, Brussels; OECD/EU (2019), *Supporting Entrepreneurship and Innovation in Higher Education in Romania*, OECD, Paris/EU, Brussels; OECD/EU (2018), *Supporting Entrepreneurship and Innovation in Higher Education in the Netherlands*, OECD, Paris/EU, Brussels; OECD OECD/EU (2017a), *Supporting Entrepreneurship and Innovation in Higher Education in Hungary*, OECD Skills Studies, OECD Publishing, Paris/EU, Brussels. OECD/EU (2017b), *Supporting Entrepreneurship and Innovation in Higher Education in Ireland*, OECD Skills Studies, OECD Publishing, Paris/EU, Brussels. OECD/EU (2017c), *Supporting Entrepreneurship and Innovation in Higher Education in Poland*, OECD Skills Studies, OECD Publishing, Paris/EU, Brussels. (2017b); OECD (2015a), *Supporting Entrepreneurship and Innovation in Higher Education in Bulgaria*, OECD Publishing.

## The HEInnovate dimensions in the Italian context

Italy, a G7 country, is the sixth-largest economy in the OECD and the second manufacturing power in Europe. For a country in such position, knowledge, science, and HEIs play a primary role in determining both the current state and the future developments of the national system.

The *OECD HEInnovate Review of Italy*, based on the specific request of national authorities, focuses on four key dimensions, selected among the eight of the HEInnovate framework: Knowledge exchange and collaboration; the Internationalised institution; Digital transformation and capabilities; Organisational capacity: funding, people, incentives. The report discusses these four dimensions in detail in Chapters 3, 4, 5 and 6. However, the OECD has collected a broader set of information that allows generating some analysis on all the dimensions of the framework. In particular, with the support of national authorities, a Leader Survey was administered to all Italian HEIs (Box 2.2). Although the response rate has been relatively low (18 responses out of 87 HEIs), the survey provides some useful insights to discuss the performance of the higher education system and HEIs in a more holistic fashion.<sup>1</sup>

### Box 2.2. The HEInnovate Leader Survey

#### The Leader Survey in Italy, 2019

As part of the HEInnovate country reviews, an online survey was administered to Italian senior management of higher education institutions (HEIs), in order to complement the information obtained from the background report and the study visits. The questionnaire reflects the eight dimensions of the HEInnovate self-assessment tool and asks questions about the leadership and governance, the organisation of the HEI, the way in which entrepreneurship education is delivered, facilities preparing and supporting entrepreneurs, and so on. The response rate is relatively low. A total of 18 Italian HEIs (approximately 21% of the total of 87 institutions) filled the questionnaire. In 11 cases, the questionnaire was filled by the central administration (rector's or president's office), in the other 7 cases, it was filled by the staff who is involved in or responsible for entrepreneurship education activities and start-up support.

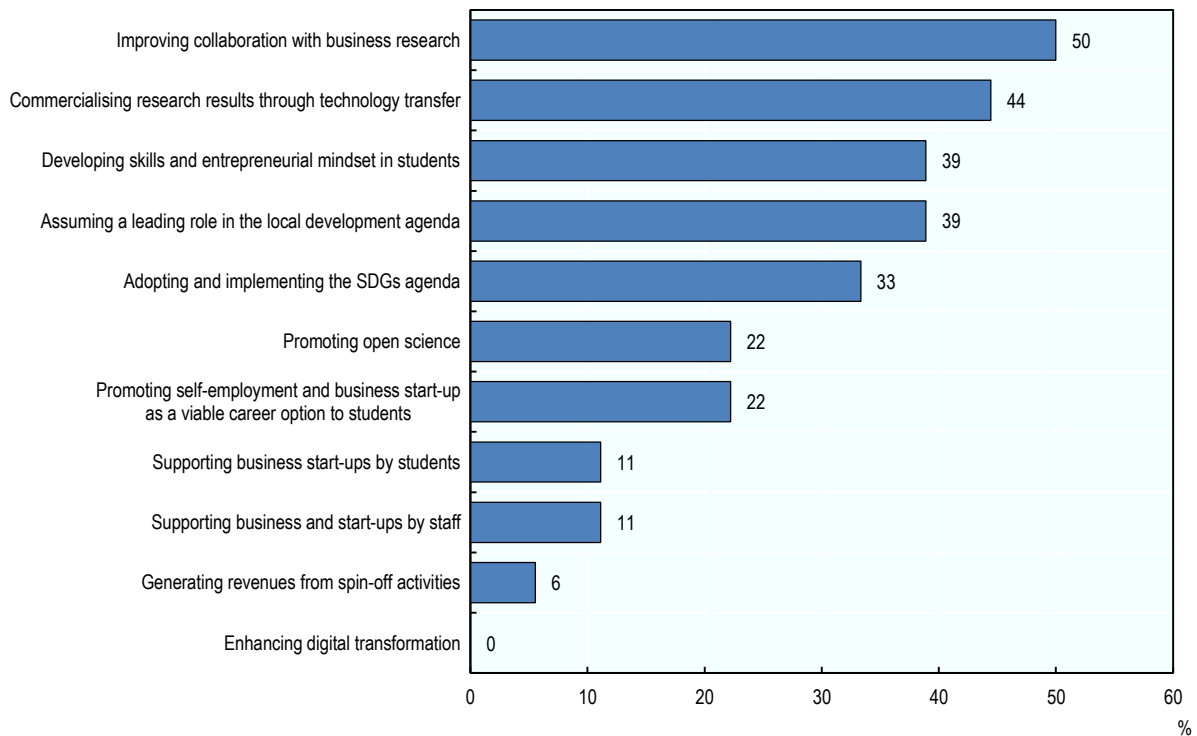
### *Leadership and governance*

Leadership and governance arrangements are crucial to set strategic visions and goals and define the framework of incentives to promote the entrepreneurial and innovation agenda within HEIs. Many HEIs across OECD and EU countries include the words “innovation” and “entrepreneurship” in their mission statements but, in an innovative and entrepreneurial institution, this is more than a reference. Entrepreneurship should permeate the strategy of innovative HEIs and affect visions, values and missions. For example, an HEI could have a mission statement and written strategy, setting out an entrepreneurial vision for the future of the institution. This strategy could clearly emphasise the importance of entrepreneurship, culturally, socially and economically. In addition to the strategy, it is equally important to articulate a clear implementation plan with clear objectives and define key performance indicators to measure progress.

HEIs in Italy are autonomous organisations defining their own governance structure and internal organisation within the national regulatory framework. The main governance bodies are: i) the rector, who is supported by a team of vice-rectors and usually also by other delegates; ii) the academic senate, which represents the academic community; iii) the administrative board, which includes internal and external stakeholders; iv) the audit body and the evaluation body; and v) the director-general, appointed by the administrative board, who is in charge of the administration of the university.

Typically, the rector and his/her team are in charge of the university strategy to support innovation and entrepreneurship in Italy. At the administrative level, there are generally dedicated offices for research and technology transfer. Departments mostly committed to innovation and entrepreneurship generally appoint a dedicated team of people to support the innovation and entrepreneurship strategy. According to the report of the Research Quality Assessment Exercise 2011-14 (ANVUR, 2016), 69 out of 98 Italian universities have created a senior leadership role to foster entrepreneurship and innovation. The University of Urbino, for example, was one of the first to appoint a vice-rector for engagement and knowledge exchange.

More in general, however, Italian HEIs have been experimenting with different governance arrangements. Several universities, including case studies of the HEInnovate review, have developed new bodies to connect with external stakeholders and engage with the entrepreneurial and innovation agenda. Several universities have created joint laboratories or scientific parks to engage with the business sector and promote innovation. In other cases, universities have established internal working groups to promote entrepreneurship. In Lombardy, a joint foundation called University for Innovation (U4I) was established in 2018, bringing together three universities (Milano-Bicocca, Pavia and Bergamo) and aimed at increasing the entrepreneurship culture in the universities, as well as providing knowledge and competencies to promote the transfer from a discovery (patent or other) to a commercialised product. Smaller HEIs have decided to join efforts and acquire a critical mass to better support innovation and entrepreneurship. An example is the Joint Technology Transfer Office “JoTTO”, established in 2015 by the IMT School of Advanced Studies in Lucca, the *Scuola Normale Superiore* in Pisa, the Sant’Anna School for Advanced Studies in Pisa and the IUSS University of Pavia (which joined in 2017).

**Figure 2.1. Priorities in Italian HEIs' engagement strategies**

*Note:* HEIs responded the following question: “Taking into account the HEInnovate dimensions/components listed below, please indicate the three that are most prominent in your strategy”.

*Source:* OECD HEI Leader Survey Italy, 2019.

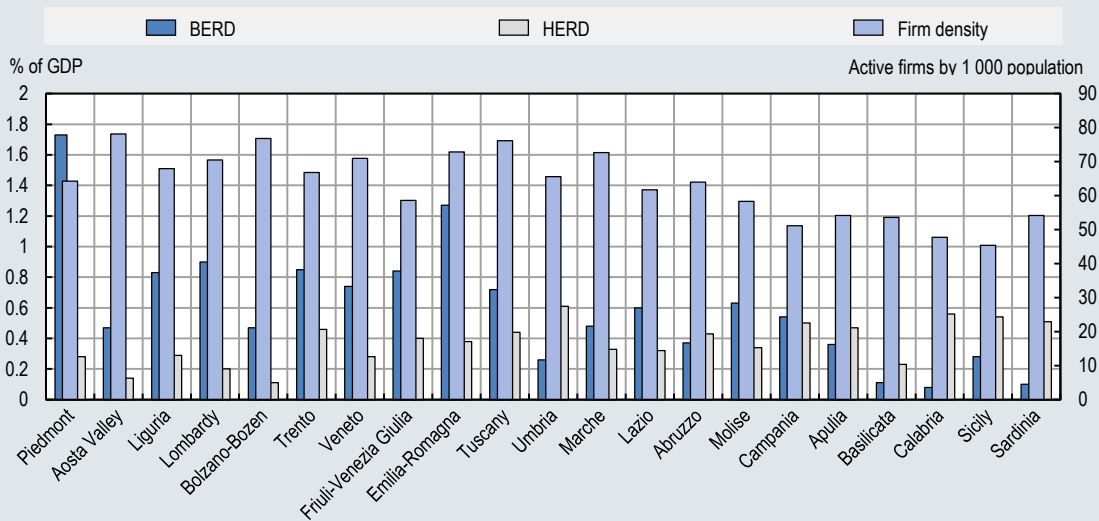
The Leader Survey provides insights into the rationale behind governance innovations. About half of the HEIs that responded to the survey put a particular focus on collaborative research (with the business community). The commercialisation of results (44%) ranks second among HEIs' strategic priorities. Two strategic objectives occupy the third place: developing an entrepreneurial mindset and skills in students (39%) and assuming a leading role in the local development agenda (39%). With the exception of the development of the UN Sustainable Development Goals (SDGs) agenda, the survey illustrates that respondent “associate” a relatively limited set of strategic priorities. For example, none of the survey respondents considers the enhancement of digital transformation as a priority for the HEI.

Unsurprisingly, regional disparities affect the way in which Italian HEIs interact with their ecosystems (Box 2.3). These differences depend on the characteristics of the region, including population dynamics and the functioning of the school system, and its economy, including expenditures on research and innovation and other factors that affect the competitiveness of the local systems, such as quality of the institutions or availability of infrastructures (Annoni, Dijkstra and Gargano, 2017).

### Box 2.3. Selected characteristics of regional economies in Italy

Italy's regional innovation ecosystems illustrate some differences that may affect the way HEIs engage with business and society. For example, there are differences in terms of the share of R&D investment generated by higher education institutions and business, and the density of firms. Northern and central regions display the highest density of firms, being home to many small- and medium-sized enterprises (SMEs). Piedmont and Emilia-Romagna are important manufacturing regions and display a relatively high level of R&D investment generated by businesses, while central and southern regions, less rich in export-oriented firms, display relatively higher levels of R&D investment generated by HEIs.

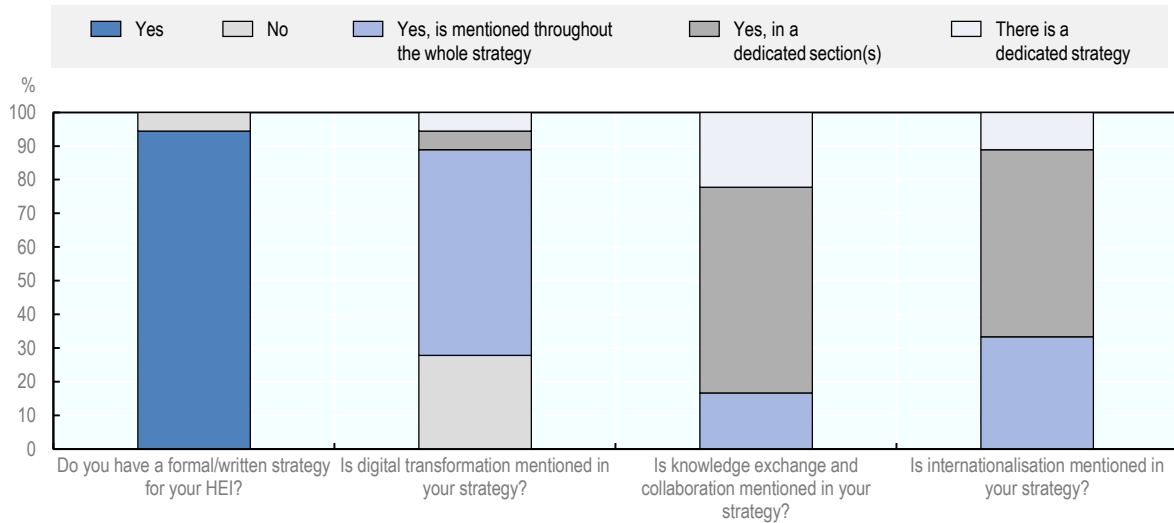
Figure 2.2. Selected regional indicators in Italy, 2015



*Note:* HERD (higher education expenditure on research and development) and BERD (business expenditure on research and development) represent the share of R&D investment made respectively by HEIs and by the business sector. The regional density of firms is measured with respect to the territorial level TL2.

*Source:* OECD dataset on Science and Technology; OECD Regional Statistics and Indicators.

The survey also asked respondents to focus more in detail on the HEInnovate dimensions selected for the Italian review (Figure 2.3). Having a formal/written strategy is now the norm – since HEIs are required by the ministry to have one. Digital transformation seems to be outside the focus of Italian HEIs, with several institutions that do not mention it among their priorities. Conversely, internationalisation and knowledge exchange and collaboration are more relevant, having either a dedicated section in the strategic document or even a dedicated strategy.

**Figure 2.3. Formal strategies of Italian HEIs and the HEInnovate dimensions**

Source: OECD HEI Leader Survey Italy, 2019.

### ***Organisational capacity: Funding, people and incentives***

The organisational capacity of a given HEI affects its ability to implement a strategy. In other words, a strategy alone is not enough; an HEI that is committed to carrying out innovative and entrepreneurial activities needs to fund and invest in these areas accordingly and consistently.

Concerning funding, success factors include the following: i) a strong alignment between investments in innovative and entrepreneurial activities and the HEI overall financial strategy; ii) a continuous and long-term engagement with funders and investors, also outside the academic world, to secure financial resources to deliver strategic objectives; iii) a balanced and diversified range of funding and investment sources, including in-kind contributions; and, finally, iv) the possibility to re-invest revenues generated from research, teaching and knowledge exchange activities.

People are, of course, also essential: they need to have or acquire the skills, the expertise and the knowledge to transform the HEI into a more innovative and entrepreneurial organisation. Finally, properly designed incentive mechanisms for researchers, staff, students and external stakeholders need to be in place to promote and strengthen innovative and entrepreneurial practices in the HEI.

In Italy, the “autonomy reform”, implemented in 2010, represents a milestone concerning HEIs’ capacity to organise themselves to promote entrepreneurial and innovation activities. For example, among others, the reform aimed to increase interdisciplinary learning and teaching. In other words, the reform has contributed to the creation of the regulatory framework that is needed to promote and implement the entrepreneurial and innovation agenda (see Chapter 6 for more details).

All HEIs adapted their organisation to the provision included in the 2010 reform. For example, the University Federico II in Naples decided to create a matrix-structure, where 26 departments in 13 disciplinary areas together provide interdisciplinary education programmes in schools, namely the School of Agriculture and Veterinary Medicine, School of Polytechnic and Basic Sciences, the School of Social Sciences and the School of



Medicine. On the one hand, students benefit from transversal and interdisciplinary knowledge; on the other hand, this architecture also allows for efficient use of inner-institutional competencies, as single departments contribute to a variety of programmes.

The Italian funding mechanism may hinder engagement and third mission activities. Compared to other OECD countries, Italy allocates a relatively large share of HEI funding based on research performance assessed by the National Agency for the Evaluation of University and Research (ANVUR). Data is collected through quality indices and peer reviews. The assessment focuses mainly on research outputs and is performed through peer review (informed by bibliometric indicators in the science, technology, engineering and mathematics [STEM] areas). The evaluation conducted by ANVUR has had a positive impact on the Italian system and it goes in the direction of the development of an evaluation culture already present in innovation-intensive OECD countries (OECD, 2017b). However, as confirmed by the Leader Survey, there may be an excessive focus on research activities (i.e. publications and venues) vis-à-vis initiatives related to entrepreneurship and innovation.<sup>2</sup> As a result, there is a lack of systemic incentives supporting innovation and entrepreneurship in the Italian higher education (HE) landscape.<sup>3</sup> In addition, any financial incentive aimed at promoting innovation should preferably be implemented with a truly rewarding modality (e.g. with extra funding) rather than re-distributive criteria.

Recognising the importance of the “entrepreneurial and innovation agenda” several HEIs have put in place a variety of incentives for “engagement”, as revealed by site visits. Creative non-salary incentives to promote innovation and entrepreneurship amongst staff comprise e.g. the provision of sabbatical years to follow innovative ideas, services and facilities for a lower price or a different computation of working hours, in case time is used for the work on spin-offs. Other incentives comprise rewards for the inventors of patents or plant ownership owned by the university. By law, at least 50% of revenues from university-owned patents have to be allocated to the inventor to be used for research or other academic activities. Other examples comprise premiums being handed over to the department for autonomous use. This might be used not only to incentivise patenting activities of HEIs as such, but especially to increase the share of universities in the ownership of a patent. The fact that the result of the Leader Survey does not reflect this trend, however, may mean that there are significant differences among Italian HEIs and that a national “model” for engagement has not emerged yet. Specifically, only 5 out of 18 HEIs that completed the survey declared that they reward staff members for their involvement in engagement activities alongside their standard job responsibilities. They all do so through salary increases, while there is no impact on promotions or on the reduction of teaching responsibilities.

### ***Entrepreneurial teaching and learning***

Entrepreneurial teaching and learning are about exploring innovative teaching methods and finding ways to stimulate entrepreneurial mindsets. This involves learning about entrepreneurship (e.g. how to start a new company), by receiving training on support mechanisms, tax rules, financial schemes and other private or public policy support. However, it also and most importantly means of acquiring the skills and competencies for developing entrepreneurial mindsets, which are often associated with the ability to tackle problems using a variety of methodologies and interdisciplinary approaches, problem-solving skills and more in general soft skills such as communication, management, organisational skills, etc. This can be achieved, for instance through, problem-based learning, interdisciplinary courses, internships, teamwork assignments, etc.

An innovative and entrepreneurial HEI provides a range of learning opportunities to facilitate innovative teaching and learning across all faculties. Such an HEI should be encouraging innovation and diversity in its approach to teaching and learning across all faculties and departments as well as developing entrepreneurial mindsets and skills across all programmes.

A range of practices can promote the development of an entrepreneurial mindset across students and staff. Examples to promote these skills across students include supporting change in curricula to stimulate and develop entrepreneurial mindsets and skills through, for instance, new teaching methods, student-centred, cross-disciplinary and project-based learning (e.g. internships, business competitions, living labs, case studies, hackathons, games and simulation). Academic staff can take part in these activities as organisers or participants. Staff can receive training on how to create a business but also support interdisciplinary teaching and research.

Extracurricular learning opportunities are an important complementary part of entrepreneurship teaching and learning provision. An innovative HEI should offer a range of informal learning opportunities to inspire students to act entrepreneurially, such as networking events between students and entrepreneurs/businesses or business idea/plan competitions. These initiatives are more effective when they are formally recognised.

Skills mismatch and adults' competencies remain key challenges in Italy (OECD, 2017b). Some reforms aiming at the university system have been introduced to address, at least in part, these issues. Based on these reforms, for example, universities are now requested to consult external stakeholders in the development and update of the new study programmes, on a regular basis. In addition, reforms introduced incentives to support students that do internships during their study programmes. In the same vein, reforms have introduced inter-sectoral training activities in doctoral programmes.

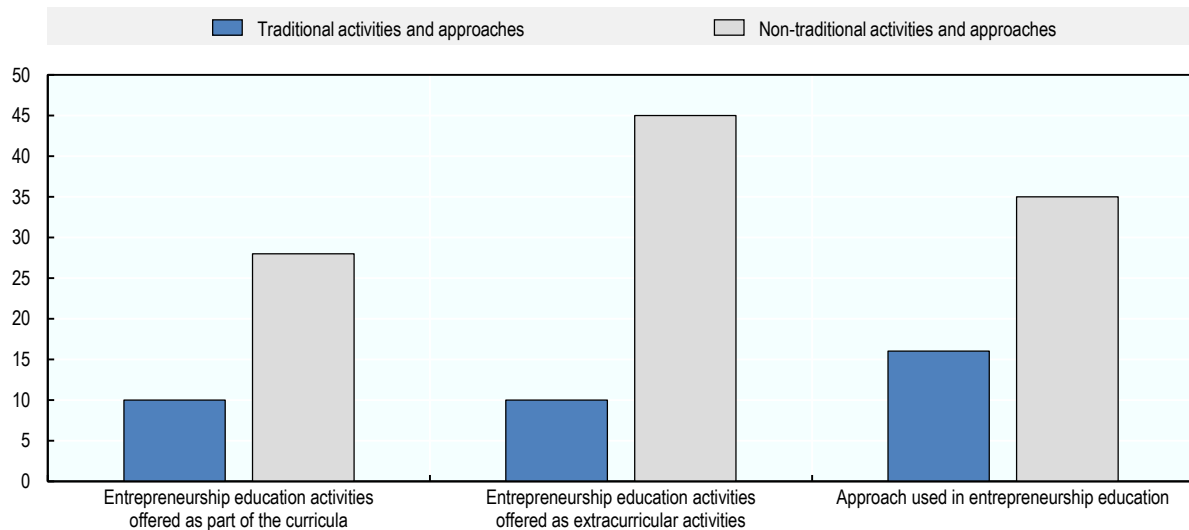
The Ministry of Education, University and Research (MIUR) encourages the development of strategies and action plans to strengthen transversal competencies and at least 20 universities in Italy adopted plans and actions to promote the development of these skills in higher education programmes. Some universities have created advanced schools or colleges where students undertake additional learning activities to improve transversal skills. These include the University of Torino, Bologna, Padova, Ca' Foscari in Venice, Udine, Macerata, Catania, Genova, La Sapienza in Rome, Camerino. Other universities have devoted efforts to promote the usage of team-based learning and problem-based learning approaches as at the University of Modena and Reggio-Emilia. Twelve institutions out of the 18 HEIs that responded to the Leader Survey also declare that they have dedicated staff to teach entrepreneurship.

A recent innovation in the higher education system was the introduction of a professional bachelor's programme or *Lauree Professionalizzanti* in Italian (OECD, 2017b). These programmes aim to develop professional technical skills at the tertiary education level in different disciplines, based on the needs of local labour markets and ecosystems. Italy needs professional skills (OECD, 2007) and it is important that *Lauree Professionalizzanti* are integrated into other institutes providing 2-year short-term tertiary professional/vocational education, the ITS. An attempt to improve integration between the two tracks consists of a co-ordination committee composed by the Conference of Italian University Rectors (CRUI), MIUR and other relevant bodies to co-ordinate the different activities.

The Leader Survey asked which activities and approaches are used by universities when dealing with entrepreneurship education (Figure 2.4). Respondents confirm that also in

Italy traditional teaching activities (lectures and frontal teaching) are becoming obsolete, while problem-based learning (PBL), simulations and direct applications, business idea generation activities and competitions, design-thinking methods, case studies and start-up competitions are gaining relevance. Education programmes often encompass internships and work-based learning, PBL, visit companies and blended learning, as opposed to traditional classroom teaching.

**Figure 2.4. Activities and approaches used in entrepreneurship education in Italy**



*Note:* HEIs responded the following questions: i) “Which of the following entrepreneurship education activities are offered as part of the curricula?”; ii) “Which of the following entrepreneurship education activities are offered as extracurricular activities?”; iii) “Which one of these approaches are used by your HEI?”.

*Source:* OECD HEI Leader Survey Italy, 2019.

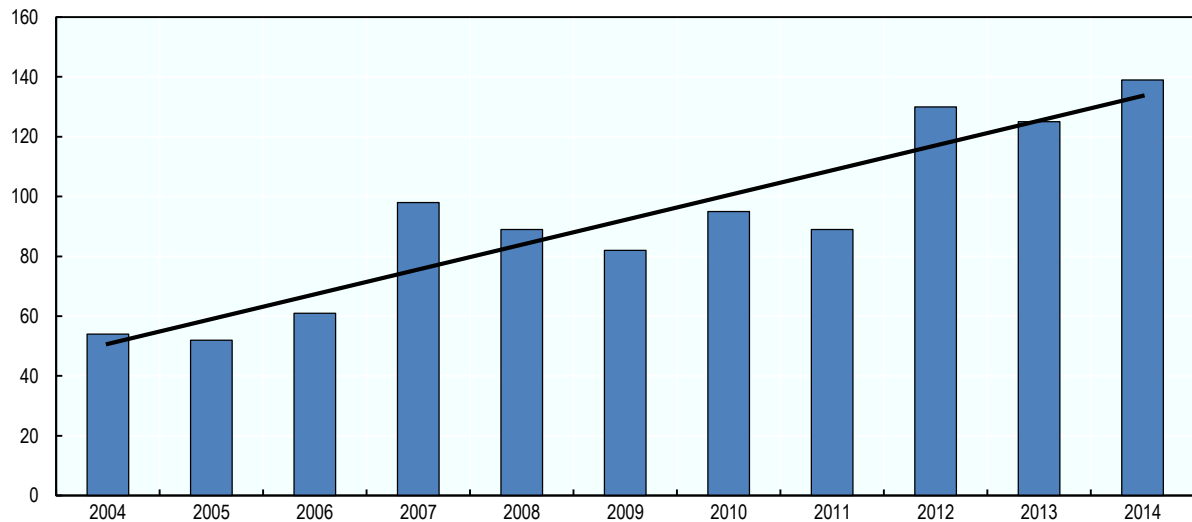
### ***Preparing and supporting entrepreneurs***

HEIs can help students, graduates and staff considering starting a business as a career option. HEIs can have an important role to help individuals reflect on the commercial, social, environmental or lifestyle objectives related to their entrepreneurial aspirations and intentions. This does not necessarily mean starting a business but rather developing an entrepreneurial mindset and the related skills necessary to work creatively also as an employee. For those who decide to proceed to start a business or any other type of venture, HEIs can offer targeted assistance to generate, evaluate and act upon new ideas, building the skills necessary for successful entrepreneurship, and importantly find relevant team members and get access to relevant networks.

Also, context matters in academic entrepreneurship (OECD, 2011). National regulations, affecting the ease of doing business in a country, is, of course, an important factor promoting business-HEI co-operation and have an obvious impact on academic entrepreneurship. However, the location of HEIs seems to play an even more important role, concerning academic entrepreneurship. National support measures are more effective when the entrepreneurship and innovation ecosystem surrounding the HEI is well developed, when, for instance, HEIs are part of a wider business and innovation support ecosystem.

Italian universities have equipped themselves to support entrepreneurship (Netval, 2018).<sup>4</sup> According to ANVUR (2016), 60 Italian universities have provided help to more than 1 000 spin-off enterprises, generating a total revenue of about EUR 165 million in 2014.<sup>5</sup> The number of academic spin-offs has been increasing over the past years (Figure 2.5). Between 2014 and 2017, 254 additional spin-offs have been established. The bulk of spin-offs are located in Italy's richest regions: 47.3% in the north and 29% in the central part of the country. There are, however, policy actions in place to promote academic entrepreneurship in all regions. For instance, the national network of incubators (PNICube) promotes either regional (StartCups) and national (Premio Nazionale dell'Innovazione) business plan competitions requiring collaboration among one or more universities, investors, private companies, national and regional authorities and foreign institutions. Finally, field visits, along with the national champions operating in cities such as Milan (PoliHub), Turin (i3p), Bologna (Almacube) and Palermo (ARCA), illustrated good practices in HEIs based in all regions, for example, the BaLab at the University of Bari, in Apulia, and Campania Newsteel, the incubator of the University of Naples Federico II. These incubators are home to highly engaged teams work to scout talent in their own ecosystem.

Figure 2.5. New spin-offs accredited in Italy, 2004-14



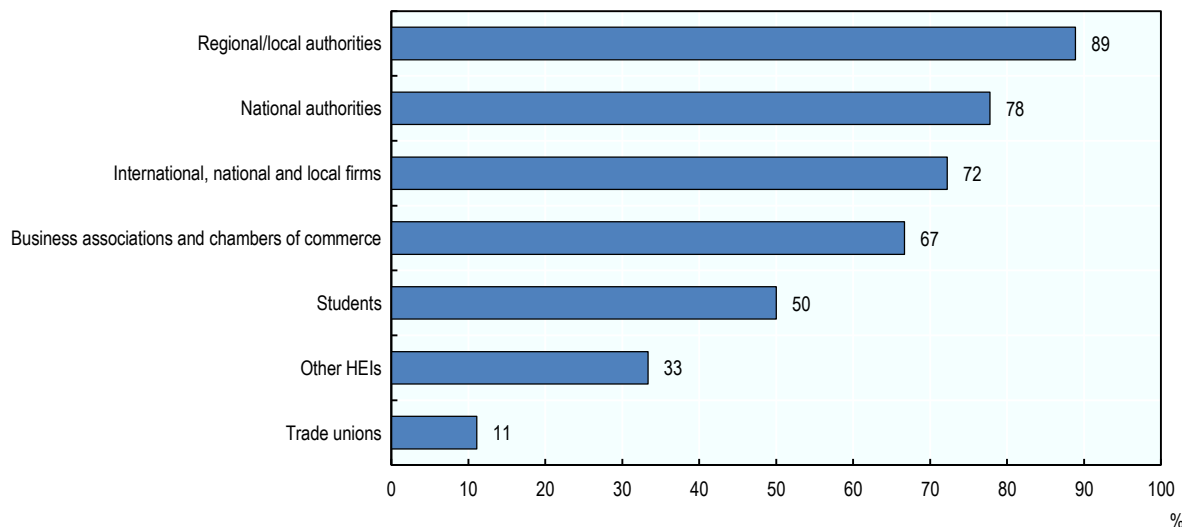
Source: ANVUR (2018), *Rapporto biennale sullo stato del sistema universitario e della ricerca*, <http://www.anvur.it/wp-content/uploads/2018/08/ANVUR-Rapporto-2018.pdf>.

Responses to the Leader Survey confirm the popularity of spin-offs over other approaches to preparing and supporting entrepreneurs with Italian HEIs. Only five respondents said they have an incubator, while only two have an accelerator. Illustrating the variety of cases, however, those HEIs that have an incubator are acquainted with the instrument and offer a wide range of services, such as temporary rentals, use of the HEI's IT services, coaching and training, access to laboratories and research facilities, and support for prototype development. In particular, respondents identify access to infrastructures (67%) and assistance with business plans or start-up competitions (50%) as the main measures in place, followed by providing access to start-up networks (44%) and assistance with applications for public funds (39%). Much less relevant are measures such as mentoring (28%), help in finding co-funders (17%), provision of financial resources (11%), and

support with prototype development (6%). None of the respondents prioritised the provision of post-start-up support measures.

Public authorities, and in particular regional and local governments, are Italian HEIs' main partners concerning entrepreneurship support (Figure 2.6). In line with the importance given to the local development agenda (see Figure 2.1), most respondent universities (89%) consider local and regional authorities as their main partners. A relevant role is attributed also to firms (72%) and business associations and chambers of commerce (67%). A much more marginal role, instead, is played by students (50%) and unions (11%).

**Figure 2.6. Main collaboration partners of Italian HEIs in supporting entrepreneurship**



*Note:* HEI leaders responded to the following question: “With which of the following organisations/institutions does your HEI collaborate in supporting entrepreneurship?”.

*Source:* OECD HEI Leader Survey Italy, 2019.

### ***Digital transformation and capability***

The HEI's digital capability refers to the ability to acquire, integrate, use, optimise and transform digital technologies to support innovation and entrepreneurship in higher education. In this sense, digital capabilities are closely connected to the concept of digital transformation. The digital transformation is affecting and changing significant aspects of education, research, engagement and management activities of HEIs. The education system as a whole has to adapt and evolve to take advantage of new technologies and tools and become a driver of digital innovation.

The digital transformation process then becomes an element actively supporting innovation in all HEIs' missions, including the third mission in all of its dimensions. This implies a dual perspective: one internal to HEIs, which implies the digital transformation of institutions (infrastructure, teaching, research activities, organisational structures); one external to HEIs, concerning the enabling role universities must play to foster digital innovation in their own ecosystems.

All HEIs visited during study visits are very active in terms of projects and initiatives regarding digital technologies. Italian HEIs focus mainly on two areas: the production and use of online courses; and the introduction of digital services for students. The CRUI analysed the state of the art in the so-called massive open online course (MOOC) market

in Italy in 2015, showing an exponential growth from 2 courses in 2012 to 120 in 2015 (Paleari et al., 2015). One of the most advanced systems is the online platform “Federica” of the University of Napoli Federico II. Concerning the introduction of digital services for students, a pioneering experience is that of the University of Bologna, which has put in place several services for its students ranging from a mobile app to assess teaching quality, to an app (co-designed with students) offering career guidance and orientation services.

Other initiatives related to digital capabilities in Italian HEIs concern open science/open access and Industry 4.0. Some Italian HEIs have adopted open science and open access policies. This group of 27 HEIs (out of 98) had an open access policy as of December 2017. A good example is the University of Bologna Open Data portal, which has made available datasets on its activities and organisation and aims to provide access to research data in the near future. The CRUI has created a working group on open access, which has defined guidelines and recommendations for universities.<sup>6</sup> Another important driver of digitalisation in HEIs has been the National Plan Industry 4.0 (I4.0) launched in 2015 by the Ministry for Economic Development (MiSE). The plan promotes the diffusion of digital technologies and digital innovation, supporting the creation of innovation ecosystems connecting HEIs and companies.

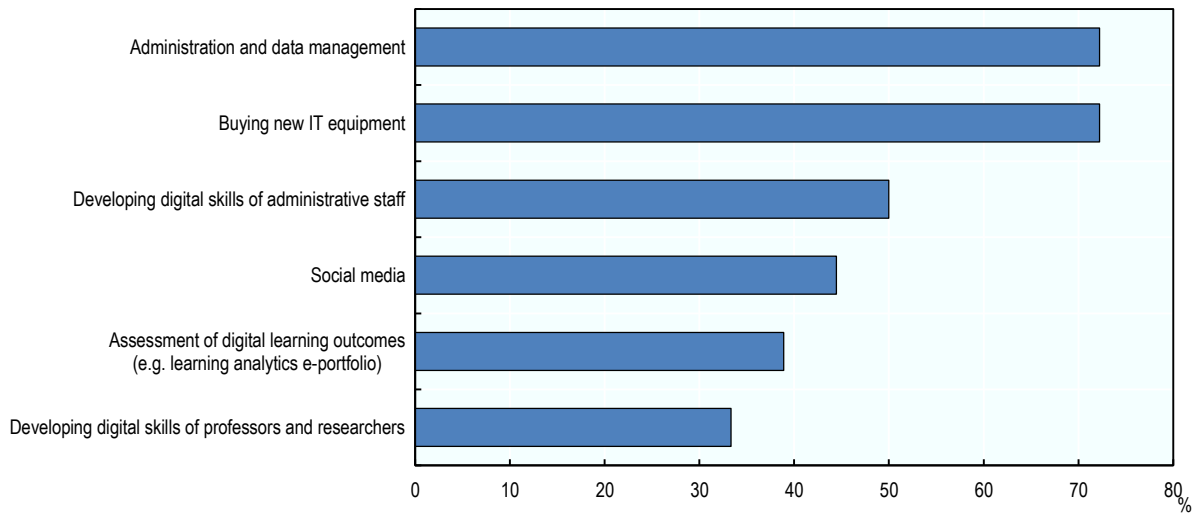
Concerning digital capabilities, the Leader Survey provides insights on the priorities that HEIs have in terms of digital transformation and in particular on the latest investments in digital technologies made by the institutions (Figure 2.7). Traditional information technology (IT) investments, including administration, data management and equipment top HEIs’ spending in digital technologies. Conversely, investments in the digital skills related to teaching and learning, and research are still at a lower level of priority.

As for the use of digital teaching methods, the Leader Survey provides data on the relative popularity of different tools. The majority of the respondent HEIs makes use of platforms and course management systems such as Moodle (56%), while less diffused are tools such as blended learning (50%), MOOCs (44%), self-produced online courses and lectures (44%) and self-learning activities using digital resources (39%). Few organisations (17%) use none of these tools for learning, while only one HEI makes also use of virtual reality applications in teaching.

### ***Knowledge exchange and collaboration***

Innovative and entrepreneurial HEIs do not operate in isolation but are strongly connected to other stakeholders within their ecosystems. Knowledge exchange is an important catalyst for organisational innovation, the advancement of teaching and research, and local development. It is a continuous process, which includes the so-called “third mission” of an HEI, defined as the stimulation, direct application and exploitation of knowledge for the benefit of the social, cultural and economic development of society.

**Figure 2.7. Allocation of most recent investments in digital technologies and systems performed by Italian HEIs, 2017-19)**



*Note:* HEI leaders responded to the following question: “Indicate the main areas in which your HEI has implemented investment in digital technology/systems over the past biennium”.

*Source:* OECD HEI Leader Survey Italy, 2019.

An entrepreneurial and innovative HEI engages with the external environment through a variety of activities ranging from informal activities, such as clubs and networking events, to formal initiatives such as internships, collaborative research, industrial PhDs and entrepreneurship projects.

HEIs in Italy have developed a broad understanding of knowledge exchange that goes well beyond the traditional emphasis on technology and research linkages with the business sector, start-ups and spin-offs only. These channels are a very important element of knowledge exchange between HEIs and the surrounding ecosystem, but knowledge exchange is not limited to that. Examples of this broader knowledge exchange initiatives include, for example, a strong emphasis on: the SDGs; the inclusion of migrants; and, finally yet importantly, cultural amenities, including museums, theatres, opera houses, archaeological sites, etc. (as noted in field visits in Palermo, Pisa or Siena). In some cases, these collaborations even led to the creation of university spin-offs in cultural-related industries. According to recent data from ANVUR, also for what concern cultural amenities, knowledge exchange activities change according to the geographical location of HEIs. Universities in northeast and central Italy exhibit higher levels of activities in the field of archaeology, while universities in the south have developed extensive collaborations with museums.

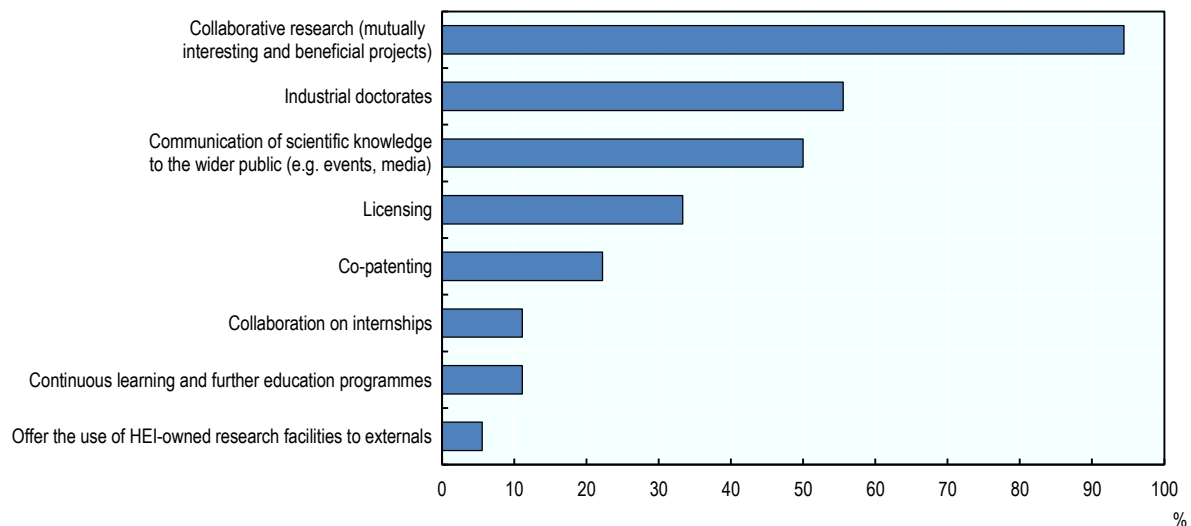
Examples from the study visits are numerous. The University of Tor Vergata created an office for sustainable development. The University of Bologna has put SDGs in its overarching strategy and works with the municipality and the region to support the integration of refugees. In addition, the university has developed humanitarian projects in Africa in collaboration with a number of non-governmental organisations (NGOs) and gives European Credit Transfer Scale (ECTS) credits to students involved these activities. The university collaborates closely with local companies, also to define study programmes. Together with other universities in the region, companies in the automotive sector (particularly numerous in the Emilia-Romagna region: Ducati, Ferrari, Lamborghini and

Piaggio are just some of the most well-known brands) have developed a master’s programme entirely in English where students are offered interships. This master’s course is very successful and has already gained attention from international students and also HEIs abroad.

The University of Palermo is closely connected to local museums and cultural heritage institutions in the region. They even chose every year a landmark cultural building in the city in which to host the inauguration of the academic year to bring the university closer to the city and people. The University of Bari has developed a very interesting approach to support the inclusion of refugees in the city. The university’s Centre for Lifelong Learning has a specific focus on migrants. They provide vocational education to migrants and refugees by combining expertise in psychology, sociology, pedagogy and other social sciences. They combine an approach based on research in these areas, with education and training and engagement with individuals and actors outside academia. Research, teaching and engagement are combined, interlinked and reinforce each other. The centre has been accredited as best practice by the European University Association.

Based on the Leader Survey, the most common practice is that of collaborative research (Figure 2.8). No HEI mentioned practices such as selling products, selling of prototypes, systematic or ad hoc involvement of external stakeholders in teaching, consultancy contacts or collaboration on secondment. Sixteen respondents, out of 18, identified the third mission as a source of revenues for their HEI. These revenues originate from co-operation with businesses. Fundraising activities and participation in start-ups are also important, while co-operation and consulting with public authorities are less lucrative.

**Figure 2.8. Practices of knowledge exchange and collaboration of Italian HEIs**



*Note:* Leaders responded to the following question: “Knowledge exchange and collaboration can take various forms. The focus can be on teaching, research or any form of strategic collaboration with external stakeholders. Which of the following are currently practised at your HEI? Please pick the three most prominent for you”.

*Source:* OECD HEI Leader Survey Italy, 2019.



### *The internationalised institution*

HEIs increasingly compete and operate at the international level. For this reason, they often integrate an international or global dimension into the design and delivery of education, research and knowledge exchange. Internationalisation of HEIs is not an end in itself, but a vehicle for change and improvement by learning from peers from other countries. International connections contribute to introduce alternative ways of thinking, questions traditional teaching and research methods, opens up governance and management to external international stakeholder, offer opportunities to exchange knowledge and collaborate with relevant partners (business, academia, public agencies, etc.) abroad. Therefore, it is linked very strongly to innovation and entrepreneurship.

International mobility brings in new education and research ideas, develops intercultural connections and long-lasting partnerships (Appelt et al., 2015). In addition to attracting international staff and students, an innovative and entrepreneurial HEI actively encourages and supports the international mobility of its staff and students. It can promote, encourage and reward international mobility through exchange programmes, scholarships, fellowships and internships, for instance through European programmes.

The Italian university system is not yet as international as the one of comparable large European countries and G7 economies: according to 2016-17 data, only 5.1% of students and only 3.7% of academic staff comes from abroad. Moreover, while the share of incoming Erasmus students has remained almost stable (from 1.46% in 2012 to 1.57% 2016), the share of outgoing Erasmus students has increased from 2.08% in 2012 to 2.80% in 2016.

For this reason, Italian authorities have developed the *Strategy for the Promotion Abroad of Italian Higher Education 2017-20*, the first strategy for the internationalisation of higher education, jointly approved by the Ministry of Foreign Affairs and MIUR. However, the total funding allocated for internationalisation remains limited (EUR 18 million allocated by the Presidency of the Council of Ministers and EUR 150 million by the parliament; see MIUR, 2018). MIUR is currently also working to reinforce the web portal *Universitaly* to provide information about tertiary education in Italy. This aims to become the main entry point for procedures for incoming students and researchers.

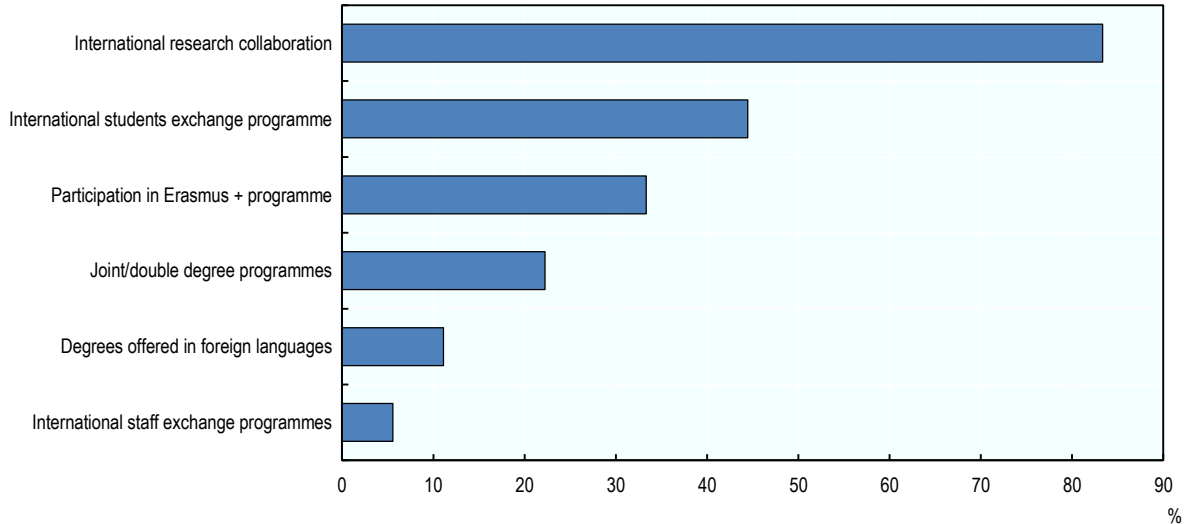
Despite these efforts, Italy does not have an integrated promotion mechanism or a dedicated agency supporting the internationalisation of the higher education system like the ones existing in countries such as France (Campus France), Germany (DAAD) or the United Kingdom (the British Council), which generally work across different key ministries and agencies involved in the internationalisation of tertiary education, science and research.

Finally, the study visits highlighted how only very few HEIs in Italy have developed and implemented an integrated strategy regarding internationalisation which goes beyond education. Most HEIs are particularly active in increasing the number of foreign students (especially Erasmus but also degree-seeking students) and less strategic in the way they internationalise their research activities or their engagement with relevant non-academic actors, including companies abroad. An interesting example was the one offered by the University of Bologna, where the internationalisation strategy clearly emphasises the role of the university as a channel to open the door to new foreign markets to local SMEs.

Based on the Leader Survey, Italian HEIs consider as internationalisation priorities research collaborations and exchange programmes such as Erasmus (Figure 2.9). These are fairly traditional approaches to internationalisation. None among the Italian HEIs that responded

to the survey mentioned as their priority international internships or the possibility of having an office attached to an HEI abroad. In addition, the Leader Survey provides information on the attraction of international staff. In particular, 10 respondents out of 18 declared to have in place recruitment policies and practices to attract international staff.

**Figure 2.9. Strategic priorities in the internationalisation of Italian HEIs**



*Note:* HEI leaders responded to the following question: “Which two of the following activities undertaken by your HEI, are the most relevant within your internationalisation strategy?”.

*Source:* OECD HEI Leader Survey Italy, 2019.

### ***Measuring impact***

Impact measurement is a transversal dimension within the HEInnovate framework. Innovative HEIs need to understand the impact of the changes they introduce in their institution and in the wider ecosystem they operate in. Innovative and entrepreneurial HEIs combine institutional self-assessments, external evaluations and evidence-based approaches. However, impact assessment of innovation and entrepreneurship activities in HEIs remains underdeveloped. This is partly due to the fact that the currently available metrics typically focus on graduate entrepreneurship, the number of spin-offs, the volume and quality of intellectual property and of the commercialisation of research results. Such metrics do not take into account important factors such as teaching and learning outcomes, the contribution to local economic development and the impact of the broader entrepreneurial and innovation agenda such as social and cultural dimensions.<sup>7</sup>

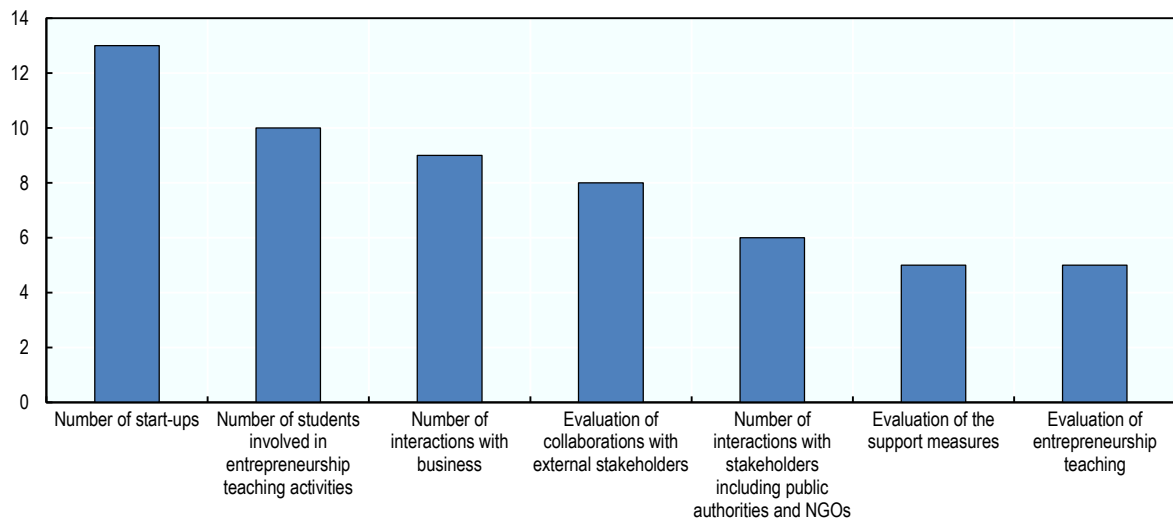
Italy has made significant efforts to improve the monitoring and evaluation of its higher education system in the recent past. Both MIUR and ANVUR were instrumental in the improvements introduced in the system. New comprehensive data collections were also launched in several areas such as student and graduate careers, scientific output of academic personnel, administrative personnel, study programmes, research quality, internationalisation, teaching, HEI budgets and their sustainability and also knowledge exchange and engagement activities.

These databases have been updated with information on the labour market from the national statistical office. The indicators developed through the data collection are used for periodical evaluations and accreditation mechanisms and are also used for the allocation of

performance-based funding. Each university can monitor and track these indicators to know its positioning in the Italian context. During the study visits, the university expressed a positive appreciation of these monitoring and evaluation efforts for steering the system towards improved quality and also to allow universities to compare the activities and outcomes with peers in the system.

ANVUR is also discussing possible mechanisms to evaluate knowledge exchange and engagement. As everywhere in OECD countries, the debate on the best way to monitor and evaluate knowledge exchange and engagement is still open. The level of the discussion in Italy is well advanced and is taking into account different dimensions avoiding a simplistic approach that only takes into account some types of engagement. Knowledge exchange and engagement activities are divided by ANVUR into two categories: those involving economic valorisation of research and those producing public and social goods. Indicators regarding intellectual property (IP) generation, spin-offs, licensing agreements, support infrastructure such as technology transfer offices (TTOs), incubators, science parks are collected and compared. At the same time, indicators including the management of cultural assets (archaeological sites, museums, music production, libraries, etc.), public health (clinical trials, etc.), lifelong learning initiatives, open teaching initiatives (such as MOOCs) and advanced training programmes are also collected. This places the reflection undergoing in Italy at a very advanced stage compared to other countries participating in the HEInnovate programme.

**Figure 2.10. Indicators for the evaluation of third mission activities used by Italian HEIs**



*Note:* HEI leaders responded to the following question: “What are the indicators that are measured or the dimensions that are assessed?”.

*Source:* OECD HEI Leader Survey Italy, 2019.

Fifteen out of the 18 HEIs that responded to the survey assess, evaluate or measure their activities related to the third mission. Most of them use basic indicators, such as the number of start-ups and the number of students involved in third mission activities (Figure 2.10). However, several HEIs have started implementing more complex forms of assessment, based on qualitative methodologies done by external evaluators, to assess start-up support measures, and entrepreneurship education activities.

## Notes

- <sup>1</sup> The Leader Survey was not administrated to online universities.
- <sup>2</sup> Most respondents (17 out of 18) perceive that activities related to “engagement” are not taken into account by the national evaluation system. In addition, most of them (13 out of 18) underline that the evaluation framework does not reward engagement activities.
- <sup>3</sup> For a discussion on the Italian evaluation system, the Diagnostic Report of the National Skills Strategy of Italy (OECD, 2017).
- <sup>4</sup> Netval (2018) reports 56 active Technology Transfer Offices (TTOs) for the year 2016.
- <sup>5</sup> Following the definition provided by ANVUR (2016), a spin-off: i) operates on the basis of the research results produced by the university and/or entertains systematic collaborative relationships with the university; b) does not require either the university to be a shareholder of the enterprise, or the presence of university researchers in the management bodies; iii) is formally accredited by the university.
- <sup>6</sup> Open science improves the effectiveness, quality and productivity of a research system, encourages the adoption of new research methodologies and scales up innovation in HEIs (OECD, 2015b; Dai, Shin and Smith, 2018). Through open science, the HEI promotes collaborative efforts, faster knowledge exchange, and new ways of sharing results (including publications, research data and methodologies) among students, staff and society.
- <sup>7</sup> The lack of an effective measurement of the impact of engagement activities is that – even in advanced innovation-intensive countries – there is no consensus on the metrics to use to assess many of these initiatives. In addition, due to the wide range of activities, there is no consensus about the timescale to use for measuring such impacts.

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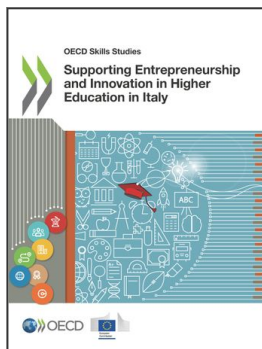
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