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POLICIES TO SUPPORT STUDENT ENTREPRENEURSHIP

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This document is an initial contribution to the TIP 2017-18 project on assessing the impacts of the policy mix for knowledge transfer between industry and science [DSTI/STP/TIP(2017)9] on student entrepreneurship policies. It develops a tentative policy framework to trigger discussions in view of future case studies.

Countries are invited to volunteer case studies of policies aimed at promoting student entrepreneurship in view of developing a cross-country analysis of different approaches, challenges faced and ways these have been addressed.

This document was written by José Guimon, consultant to the OECD, and Caroline Paunov with inputs from Sandra Planes-Satorra and Cynthia Lavison.

Caroline Paunov, Senior Economist, Email: caroline.paunov@oecd.org

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POLICIES TO SUPPORT STUDENT ENTREPRENEURSHIP

Executive summary

Student entrepreneurship constitutes a powerful and until recently often overlooked channel through which academic research can have bigger impacts on innovation.

Student entrepreneurship can be promoted by integrating more explicitly entrepreneurship training in educational programmes of PhD and post-doctoral students and by providing direct support to student-led start-ups and related involvement in innovation.

The policy mix to support student entrepreneurship may comprise many different financial instruments, regulatory reforms, and "soft" instruments, implemented by universities and public institutions.

While public policies across many countries have paid increasing attention to promoting student entrepreneurship, evidence about existing policy instruments and key factors for their success remains scattered.

Universities are core actors in supporting these developments, mainly through their teaching role but also through their research and innovation roles.

Open questions for the TIP activity and related case studies to address to identify best practice include the following:

- What can we learn from (the success or failure of) different recent policy programmes to support student entrepreneurship in OECD countries?
- How can governments and universities work together in supporting successful student entrepreneurship?
- What challenges have student entrepreneurship programmes faced with regards to successfully building bridges between industry and science? What approaches have allowed overcoming those challenges?
- What kind of approaches work better in what contexts to promote entrepreneurship among doctoral students and early career researchers to promote industry-science linkages?
- What do we know from impact assessment exercises about the success of student entrepreneurship programmes? What impact assessment methodologies have been implemented to gauge the success of these programmes?

1. Introduction

1. Student entrepreneurship is an important channel through which scientific knowledge can be transferred to the market. Bill Gates and Steve Jobs are but two very famous former students who showed world-leading entrepreneurial talent to mark the industry they were operating in for decades. While they did not receive specific governmental support, their example illustrates the importance of student entrepreneurship and related policies. Public policies have traditionally focused on other channels, such as patent transactions and the creation of spin-offs by established scientists and professors. While fostering student entrepreneurship is important at all education levels (European Commission, 2016), research institutions are important to support research-based entrepreneurship (OECD, 2016). In line with this fact, recent policy developments point to a greater relevance of policies aimed at supporting entrepreneurship by doctoral students and early career researchers (e.g. post-docs).

2. While student entrepreneurship is receiving greater policy attention in recent years (Cedefop, 2011; OECD, 2010; OECD, 2016), it still remains a largely uncharted policy area. The purpose of the TIP activity on this topic will be to develop a systematic policy framework that considers the different policy options to support student entrepreneurship. This framework will then be illustrated with different case studies and country experiences.

3. This document is an initial input to the TIP work on student entrepreneurship. It aims to provide the background for an initial discussion around key policy issues related to the promotion of student entrepreneurship. This and further discussions would address the following questions: What role can student entrepreneurship policies play in supporting knowledge transfer from public research to industry? What policy approaches help stimulate student entrepreneurship? What is best practice in boosting the success of such policies?

4. The remainder of the document is structured as follows; section 2 discusses the rationale for student entrepreneurship policies while section 3 provides different types of public support. Section 4 discusses specific examples while section 5 proposes next steps and open questions for the TIP activity to explore.

2. Why should public policy support student entrepreneurship as a conduit of industry-science linkages?

Advantages of student entrepreneurship as channel for industry-science linkages

5. As emphasized in the recent TIP Knowledge Triangle project, all three functions of HEIs are critical to enhancing the positive impact of science on industry innovation. Student entrepreneurship can enhance the commercialization of university knowledge by students and young researchers, adding to support for well-established professors and scientists. This is particularly relevant in the case of doctoral students and early career researchers, who have the potential to link industry with frontier knowledge at the transition stage of their careers when they need to decide whether to work for industry or engage in an academic career (OECD, 2016). Established researchers in their institutions may lack incentives to commercialize their research and engage in business activities.

6. If student entrepreneurship works properly, new employment opportunities for the youth are created and better connections between scientific knowledge and industry can be established. Universities are uniquely placed to facilitate these connections by combining their education and research functions, holding in this way a unique position to optimize inputs.

Barriers hampering student entrepreneurship

7. However, very often universities fall short of supporting student entrepreneurship, as a result of financial constraints; lack of incentives within the funding systems of universities and within the career tracks of professors; lack of entrepreneurial skills and knowledge of existing professors; and, more broadly, a poor entrepreneurial culture within HEIs and resistance to change.

8. These barriers motivate a more active involvement of policymakers in promoting student entrepreneurship. The increasing attention given by policymakers to student entrepreneurship also reflects the need to address mounting youth unemployment in some OECD countries, by making labour markets more dynamic as well as stimulating the creation of start-ups (Bruno et al., 2016).

Rationale for policy intervention in support of student entrepreneurship

- Rationales for policy intervention include the following: Students (especially PhDs) and early career researchers (e.g. postdocs) hold large unrealized potential as a conduit of stronger impacts of industry on science and vice versa. Policies targeting professors and senior researchers may be complemented by policies reaching out to this group.

- The digital economy is transforming the business landscape and labour markets are opening up new opportunities that could be exploited by student-led start-ups, more so than in the past.

- Fostering student entrepreneurship may contribute to tackle youth unemployment, which has reached record levels in many OECD countries.

3. How can public policy support student entrepreneurship?

9. The policy mix to support student entrepreneurship, as outlined in Table 1, may comprise many different financial instruments, regulatory reforms, and "soft" instruments, acting across two channels: strengthening entrepreneurship skills and supporting student-led start-ups (Table 1).

Table 1. Overview of the policy mix to support student entrepreneurship

University mission	Type of policy	Policy instruments
Entrepreneurship education	Financial instruments	• Provide funding for courses on entrepreneurship across disciplines • Provide funding for company visits • Promote entrepreneurship training for university professors • Promote internships and apprenticeship programmes with specific placements in start-ups
	Regulatory reforms	• Provide guidelines for curricula reform aimed at including more courses and programmes on entrepreneurship, across all disciplines • Develop clear regulations for industrial doctoral programmes • Recruit professors with business experience • Provide incentives for professors to promote student entrepreneurship
	Soft instruments	• Leverage social media and other communication platforms for awareness-raising and training • Use of online courses and digital tools to complement classroom training. • Develop entrepreneurship educators' networks

Support to student start-ups	Financial instruments	• Fund universities' business incubators and spaces for students to collaborate in innovative projects • Encourage university-based research commercialization and entrepreneurship centres to support student-led innovation • Fund students with viable start-up projects • Fund student entrepreneurs to pay other students to work in their ventures • Create work opportunities for students in existing business incubators, knowledge hubs, technology transfer offices, and science parks • Support youth entrepreneurship competitions and awards
	Regulatory reforms	• Allow students to commercialize technology developed at the university • Define nature and duration of spin-off company ties to university • Grant student ventures the ownership and revenue of their intellectual property • Implement regulations that promote access to finance for students • Introduce support to comply with regulations to open a new business
	Soft instruments	• Carry out information campaigns for student start-ups • Inform students of available financial services for start-ups • Provide mentors to students (e.g. support student-led business' through mentorship of large buyers) • Facilitate access of student start-ups to networks of potential customers, partners and investors • Encourage the development of young entrepreneurs' and peer networks

Source: Own elaboration building on Bailetti, 2011; Cedefop, 2011; Jansen et al., 2015; OECD, 2010; UNCTAD, 2015.

Entrepreneurship education

10. Entrepreneurship education has traditionally been considered as the domain of business schools and not been delivered across all disciplines. It has been increasingly recognized that it should be extended to all types of undergraduate, graduate and post-graduate students, thus promoting interdisciplinary approaches and developing entrepreneurship skills also among 'hard science', arts, social science and humanities students (Cedefop, 2011). This is in recognition of the fact that disciplinary research skills acquired are not sufficient for engaging in industry. Measures to promote student entrepreneurship through education may include the introduction of new courses on entrepreneurship for students, training on entrepreneurship for professors, internship programmes with placements in start-ups, and regulations for industrial PhD programmes, among others (see Table 1).

Student start-up support

11. Existing approaches to support student-led start-ups include offering mentoring to start-ups, providing networking opportunities, organizing business plan competitions, providing office space for start-ups and accelerator programmes, and providing dedicated funding to student start-ups, among others (see Table 1). Cedefop (2011) distinguishes support offered by universities to promote student business ventures into: i) pre-start-up support offered to students who have an interest but no concrete business ideas; and ii) start-up support provided to students with advanced business ideas, including personalised technical support on a number of issues, such as business plan preparation, marketing of business ideas,

preparation of funding applications, financial management of new ventures, and legal training (e.g. intellectual property rights). Such support is often provided by a combination of: a) in-house enterprise and guidance experts; b) business incubators; c) entrepreneurship centres; and d) mentors and business coaches.

Policy implementation and governance

12. Student entrepreneurship policies can be designed and implemented both at the institutional level (i.e. by higher education institutions) and at the regional/national government level (e.g. by research and innovation agencies or ministries). Possibilities for public policies to influence student entrepreneurship include, aside from offering dedicated projects to promote student entrepreneurship, public policies' oversight and regulatory roles, as well as direct interventions to develop more wide-reaching policy programmes. For example, governments can foster regulatory reforms in the funding systems of public universities and in the career track of professors, attributing a greater value to engagement in student entrepreneurship.

13. Most policies to promote student entrepreneurship require close collaboration between the different stakeholders involved, including HEIs, companies, student associations, and intermediate organizations such as science parks or business incubators (Bischoff et al., 2017). This is particularly the case with greater autonomy of HEIs in OECD countries. Lessons from international experiences also suggest that engaging private actors to contribute to student entrepreneurship support as early as possible is crucial (OECD, 2010). Close cooperation and integration of university internal and external support infrastructure and services is also an important success factor. For example, career guidance services, incubators, technology transfer offices and other infrastructures and institutions within the university itself need to become more closely aligned and coordinated.

4. Examples of policy programmes across OECD countries

14. The section presents examples from a preliminary screening and do not cover all the possible policy options that were outlined in Section 3. The objective is to help identify the country case studies for analysis as part of this project activity.

Promoting industrial PhD programmes

15. Professional doctorates or industrial PhDs have become more popular across OECD countries, building on different models of collaboration between HEIs and companies. Such programmes combine academic research with elements of practice acquired in industry and often involve a direct engagement of doctoral students in broader collaborative research projects (Borrell-Damian et al., 2015; Ori, 2013). In addition to the required regulatory reform in the national legislation governing doctoral degrees, such programmes are often receiving specific support and funding by governments.

16. For example, **Denmark**'s long-standing Industrial PhD Programme places students in private companies, with the time equally divided between industry and university during their research.[1] In **Ireland**, the Industrial Partnership Research Supplements Programme provides funding to allow researchers funded by Science Foundation Ireland to undertake a collaborative research project with industry which is directly related to their original research project (EC/OECD, 2014). The Programme is mainly used to support shared PhD students and post-doctoral researchers. In **Canada**, the Mitacs Accelerate programme promotes industry placements for full time graduate students and postdocs in order

[1] http://innovationsfonden.dk/en/application/erhvervsphd.

to conduct industry-relevant research projects.[2] Based on its success in strengthening business-relevant skills of students, the Australian Council of Learned Academies has recently recommended to develop a similar programme in **Australia** (McGagh et al, 2016). These programmes often focus on the placement of PhDs in the research laboratories of large firms but could reflect further on going beyond and linking PhDs with technology-based start-ups.

17. Other programmes target employees in industry to engage in PhD studies, such as the Industrial PhD scheme in **Norway**. This programme provides annual grants to cover salary and other expenses for company employees seeking to pursue an ordinary doctoral degree (EC/OECD, 2014). Similarly, the industrial PhD student programme in **Sweden** offers grants to employees of firms to conduct during 4-5 years a PhD research project that needs to be formulated jointly with companies (EC/OECD, 2014).

18. At the supranational level, the **European Commission** is also providing support to promote industrial PhD programmes across Europe, namely through the KIC Doctoral Programmes initiative of the European Institute of Innovation and Technology.[3]

19. Some countries have also forged international research partnerships with world-class universities that contribute to enhancing the industrial orientation of their universities' PhD programmes and provide opportunities for doctoral students and early career researchers to engage in industry-relevant projects. For instance in **Portugal**, the Foundation of Science and Technology (FCT) has promoted the creation of strategic partnerships with MIT[4] and the University of Texas at Austin[5], which have established a presence in the country with the purpose of engaging in research and providing academic courses to meet market needs through entrepreneurial processes.

Support to innovative start-up creation

20. Different policy approaches are also used across OECD countries to support student-led start-ups, as the following examples illustrate. In the region of Twente in **The Netherlands**, the Temporary Entrepreneurial Position programme supports student entrepreneurs wishing to launch innovative start-up projects[6]. Support provided to selected innovative early-stage start-ups includes financial support (e.g. in the form of interest-free loans), legal and IP-related advice, office facilities, access to relevant networks (such as the Technology Circle Twente), business coaching support and research support from the University of Twente and/or Saxion University.

21. In **Latvia**, the Mentor Club was established in 2007 by graduates at the Stockholm School of Economics in Riga.[7] It provides free-of-charge mentoring support to student start-ups. The mentors are alumni from the universities who have gained significant business and management experience and who are recognised as successful experts in various industries. The mentors provide practical management and business advice, consultation, feedback on various business development scenarios, and contacts. In addition to individual mentoring, the Mentor Club organises up to 10 meetings per year at which mentors discuss specific business issues.

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2 https://www.mitacs.ca/en/programs/accelerate

3 https://eit.europa.eu/activities/education/kic-doctoral-programmes

4 http://www.mitportugal.org/

5 http://utaustinportugal.org

6 https://novelt.com/en/top-regeling

7 http://www.sseriga.edu/en/about/partners/mentor-club

Entrepreneurship and business plan competitions ran by universities

22. Business plan competitions have been created in many countries to encourage students to work on their business ideas and become entrepreneurs. Those winning the competitions are provided with resources to implement their business plans, often including both financial and non-financial support (e.g. training, coaching, access to networks, access to research facilities, etc.). The non-for-profit Venture Cup competitions in **Denmark** is a relevant example[8]. In the **United Kingdom**, the University College London runs an annual competition for student entrepreneurs called The Panel, whereby winners gain a scholarship to enrol for free in the MSc on Technology Entrepreneurship.[9] The Morpheus Cup is a pan-European competition for university student entrepreneurs supported by the **European Commission**, which offers every year 26 awards and €50 000 worth of prizes.[10]

23. Normally these competitions target undergraduate and master students, but some universities have started to focus more explicitly on doctoral students and postdocs which aim to create science-based start-ups. For example, in the **United Kingdom**, Cambridge University runs a university-owned equity fund and different business creation competitions, including a specific competition for postdocs that awarded three prizes in 2016 of up to GBP 20 000 per project.[11]

Consortia of universities to enhance entrepreneurship education

24. Beyond the wide array of initiatives undertaken by individual universities to promote entrepreneurship education, it is worth pointing at some country experiences that have been developed through consortia of several universities. A case in point is from **Denmark**, where the International Danish Entrepreneurship Academy (IDEA) was founded in 2004 to provide entrepreneurship teaching in higher education, with 38 universities and colleges as partners and the participation of a wide range of faculties.[12] IDEA also runs an International Master in Entrepreneurship Education and Training and a Diploma Course for Entrepreneurship Teachers.

Training and industry placements

25. Some governments have created specific programmes to support placements in industry for recent graduates to engage in research-related projects and foster knowledge transfer. For example, in the **United Kingdom**, the Knowledge Transfer Partnership (KTP) scheme helps businesses innovate and grow by linking them with a university and a recent graduate to work on a specific project.[13] Each KTP is a three-way partnership: the university employs the graduate, who works at the company and is partly funded by a grant from the national government.

26. In other instances, new schemes have been developed to support students to acquire practical experience in a high-tech company abroad, and thus gain first hand international experience and training that may then be transferred back into the country. In **Norway**, the Norwegian School of Entrepreneurship (Gründerskolen) programme is an academic cooperation programme involving all the universities and

8 http://venturecup.dk/national-startup-competition-2017/#

9 https://www.mgmt.ucl.ac.uk/news/win-place-msc-technology-entrepreneurship

10 http://www.morpheuscup.com

11 https://www.enterprise.cam.ac.uk

12 www.idea-denmark.dk

13 https://www.gov.uk/guidance/knowledge-transfer-partnerships-what-they-are-and-how-to-apply

several university colleges in Norway.[14] It offers students with at least a Bachelor's degree in any academic discipline the opportunity to gain first-hand experience of entrepreneurship by working as interns for three months within a high-tech start-up company abroad. Besides the work placement, students follow classes at one of the programme's partner universities (in Boston, Houston, San Francisco or Singapore), usually held in the evenings or during the weekends. These courses train students to develop business plans, and explore options for start-up financing and resource allocation, organizational structures, sales and marketing approaches, as well as ways of addressing common challenges.

5. Next steps and open questions for the TIP activity on student entrepreneurship

27. Open questions for the TIP activity to address to identify best practice include the following:

- What can we learn from (the success or failure) of different recent policy programmes to support student entrepreneurship in OECD countries?
- How can governments and universities work together in supporting successful student entrepreneurship?
- What challenges have student entrepreneurship programmes faced with regards to successfully building bridges between industry and science? What approaches have allowed overcoming those challenges?
- What kind of approaches work better in what contexts to promote entrepreneurship among doctoral students and early career researchers to promote industry-science linkages?
- What do we know from impact assessment exercises about the success of student entrepreneurship programmes? What impact assessment methodologies have been implemented to gauge the success of these programmes?

28. The project would develop a basic framing of the main rationales and alternative policy instruments and a set of core issues to be covered by country case studies (possibly around 6-8).

29. A more ambitious approach that is beyond the scope of this activity and its current funding could be to develop a questionnaire that could be completed across a wider number of countries to comprehensively collect evidence on those policies and develop a policy toolkit. The policy toolkit could be similar in design to the interactive Inclusive Innovation Policy toolkit, developed in the context of the OECD Innovation for Inclusive Growth project and that is now publicly available at the Innovation Policy Platform.[15]

[14] http://grunderskolen.no/english/.

[15] http://innovationpolicyplatform.org/inclusivetoolkit.

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