



The student technologic entrepreneurship potential and the Russia-Finland border region

Analytical study

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Introduction

Nowadays national economies and governments face a challenge of providing sustainable socio-economic development in a complex and unpredictable environment, which is high level of competition among world economies, contradictory processes of globalization and nationalization aimed at protection of national interest, emerging and changing markets as an outcome of innovative technologies. Knowledge-based economy growth stays on technology entrepreneurship which is a source of economic prosperity, as well as it contributes to increasing competitiveness and creating new jobs.

The major way to stimulate technology-based entrepreneurship is to engage in it youth, namely students. All over the world young people are attracted by career of entrepreneur which gives the sheer extend of personal freedom, and great prospects for self-realizations along with the opportunity to be successful in economic sense. Entrepreneurial activities at universities input in the acquisition of practical knowledge and skills that create a solid foundation for their personal and professional development. To build efficient and fruitful measures of stimulating student entrepreneurship is impossible without understanding current trends and state of entrepreneurship among young people. First intention to choice entrepreneurship as a future career, formation the entrepreneurial mindset occurs at the university context. Among the factors influence on students' entrepreneurial process are measures and support infractructures of the regions, and countries.

The aim of the present study is to study the best practices for the development of student technological entrepreneurship in the leading EU countries with a high innovation development index and worldwide (Denmark, Germany, Sweden, France, Norway, Portugal, depending on the material found for analysis, one or two countries can be changed) and analyze the development of student technology entrepreneurship in the border region of Russia and Finland and based on the outcomes of the study to provide the recommendations for support and development of technological entrepreneurship among students in the perspective of economic growth and international cooperation between Russia and Finland.

TO ACHIEVE THE SET AIM THERE WERE DEFINED THE FOLLOWING TASKS, NAMELY:

- 1** to consider the concept of student entrepreneurship:
which includes a brief history of the emergence of the main stages of its formation
- 2** to analyze strategies, roadmaps for the development
of universities and relevant practices for supporting student entrepreneurship
- 3** to analyze opportunities and limitations of existing management approaches
to the development of student entrepreneurship
- 4** to analyze student initiatives, organizations, communities, clubs
in the development of student entrepreneurship

- 5** to analyze best practices of educational programs, initiatives and additional vocational education in the system of university education in the context of the development of student entrepreneurship
- 6** to analyze forms of interaction with industrial partners, corporations and SMEs in the context of the development of technological entrepreneurship among students
- 7** to analyze the motivation of students for technological entrepreneurship and factors influencing its formation

In the analysis study there were used the case-study method that allows to study the bright and successful practices and secondhand data analysis. The analyzed data make it possible to work out the recommendations for development the student entrepreneurial activities, that owns the practical value for those experts who see their mission assist student on their path to the entrepreneur career. The cases were taken from Russia, Finland, France, Norway, Sweden, Switzerland, Netherland, Germany, Singapore, India, Australia and others. Besides a pilot study was conducted among the students of Russian, Finnish, Baltic Sea Region Universities, this relevance was reasoned due to their Location, the universities contribute to the regional development.

The analysis study report consists of an Introduction, 4 main chapters, Conclusion, References and Annexes on 112 p.

Chapter 1.

The concept of student entrepreneurship: what includes, a brief history of the emergence of the main stages of its formation

The history of student entrepreneurship is inextricably linked with the history of studying entrepreneurship and the emergence of new theories and practices of transferring entrepreneurial knowledge within the educational process.

Interest in developing entrepreneurial skills is growing rapidly, so new approaches are emerging to keep up with demand, as well as to keep pace with the changing nature of entrepreneurship learning. Where do these new approaches come from? And how exactly are new ways of conceptualizing entrepreneurship learning different from traditional approaches? With these two practical questions in mind, Babson College's Entrepreneurship and Entrepreneurship Education Researchers have formulated several key messages to help understand the research topics below.

The role of the entrepreneur in economic theory dates back to the early 1940s, but until 1970, very few business schools offered courses in entrepreneurship, even in the United States.

During the heyday of industrial production and the boom of entrepreneurship in the 1960s and 1980s, the prevailing opinion in entrepreneurship research was that an entrepreneur is a certain personality structure, a set of human characteristics, a system of his views and a way of thinking, to a greater extent than a set of competencies. or knowledge¹. For this reason, educational initiatives in the field of entrepreneurship were few in number and did not inspire public trust or demand among alumni, with the exception of closed business clubs where entrepreneurs and managers exchanged experiences. However, this was not education in the strict sense of the term.

At the same time, in the 1970s, the associative connotations of the term "entrepreneur" began to shift from the concepts of greed, exploitation, selfishness and disloyalty to creativity, job creation, profitability, innovation and generosity. Entrepreneurs have begun to be recognized not only as the driving force of the economy, but also as very positive and contributing members of society². The new connotation allowed entrepreneurship to gain popularity in the public consciousness, which stimulated the demand for specialized education.

In response to the characteristics-based approach³, Gartner advocated a behavioral approach to the study of entrepreneurship in 1988 with the title "Who is an Entrepreneur? Is the wrong question." For him, entrepreneurship is, ultimately, the creation of organizations, in the process of which many factors interact. The entrepreneur is only part of this major process.

^[1] Brockhaus, R., and Horwitz, P. 1986. The psychology of the entrepreneur. In D. Sexton and R. Smilor (eds.), *The Art and Science of Entrepreneurship* (pp. 25-48). Cambridge, MA: Ballinger.

^[2] Vesper, K.H., and Gartner, W.B. 1997. Measuring progress in entrepreneurship education. *Journal of Business Venturing*, 12(5), 403-21.

^[3] Gartner, W.B. 1988. Who is an entrepreneur? is the wrong question. *American Journal of Small Business*, 12(4), 11-32.

Chapter 2.

Analysis of strategies, roadmaps for the universities' development and relevant practices to support student entrepreneurship

2.1. Student entrepreneurship support measures implemented at different levels

An entrepreneurial career is in the focus of a strong interest from young people and especially students. It is natural that many students are ambitious and like to try out different things while studying. And a university can be that ideal context for testing one's entrepreneurial capabilities. Many research works show that universities serve as source of knowledge that creates new entrepreneurial opportunities which can lead to the formation of innovative new companies^[14]. Recently, becoming the 'entrepreneurial university' (the concept was introduced by H.Etzkowitz) universities in a large number of countries have transformed their strategic performance and focused on exploiting these opportunities. Reflected in the triple-helix model of university-industry-government relations the new changed role of universities confirms their contributions into regional innovation system and economy growth of a country.

2.1.1 Student entrepreneurship support measures at the national level

In macroeconomics, entrepreneurship is seen as one of the factors of economic growth. Several countries also view entrepreneurship as a solution to unemployment problems. Therefore, the promotion of entrepreneurial activity begins at the state level.

In 2019, 22% of youth (ages 15-24) who did not study at the university level were unemployed. Stimulating entrepreneurship among students solves this problem.

Also there are strong pedagogical reasons for teaching entrepreneurship, as it engages students with pressing real-world problems, develops critical thinking, and broadens their life skills.

Based on the remarkable results of the national policy in the area of student entrepreneurship development there were chosen 2 European cases for demonstration the best practices of supporting student and youth entrepreneurship - France and Netherlands.

During 5 years from 2009 to 2014 unemployment rate in France increased by 13% (from 9,11% to 10,3%). To cope with the problem, the State government established student centers for innovation, transfer, and entrepreneurship - PÉPITE, and introduced the student-entrepreneur status. Thus, in 2014 in France it was created the whole infrastructure supporting student entrepreneurship from the ground up as a part of actions directed on lowering unemployment. 5 years after governmental measures in the field of student entrepreneurship unemployment dropped by 18% (from 10,3% to 8,45%). That fact confirms the success of the implemented measures and makes the case worth studying.

^[14] Heiko Bergmann . Christian Hundt . What makes student entrepreneurs? On the relevance (and irrelevance) of the university and the regional context for student start-ups Rolf Sternberg Accepted: 19 January 2016 / Published online: 4 February 2016 / Springer Science+Business Media New York 2016 // Small Bus Econ (2016) 47:53-76 DOI 10.1007/s11187-016-9700-6 // P.55

^[15] https://www.ilo.org/wcmsp5/groups/public/—dgreports/—dcomm/—publ/documents/publication/wcms_734455.pdf

^[16] <https://www.weforum.org/agenda/2020/10/universities-should-support-more-student-entrepreneurs/>



Consequently, the activities that an entrepreneur performs in the process of creating an enterprise can be analyzed, broken down into steps, and explained. Research should focus on what the entrepreneur does, not who he is.

However, calls from researchers to move away from personality traits to behavior ultimately shifted entrepreneurship learning from a focus on one type of people to a view of entrepreneurship as a process⁴. According to Patricia Green and Candida Brush, entrepreneurship has become just another version of management - a process of leadership, control, planning and evaluation, with the difference that it is applied in new organizations, rather than in old ones. Today, process orientation is firmly embedded in entrepreneurship education.

The authors reviewed 45 entrepreneurship textbooks currently on the market, and about 80% of them focus specifically on the entrepreneurship process. Process topics included opportunity assessment, business planning, marketing planning, resource acquisition, business management and exit.

Entrepreneurship as a process has been heavily influenced by the growth in the number of strategic scientists entering the field, and a debate has ensued between strategic management and entrepreneurship researchers. A seminal article by Shane and Venkataraman (2000) introduced a definition of entrepreneurship that was distinctive and delimited strategic management of entrepreneurship, defining the latter as "identifying, assessing and seizing opportunities"⁵. This definition has become the most used and cited in the field⁶.

The next major paradigm in entrepreneurship research and education was cognitive entrepreneurship research, or the study of entrepreneurial thinking, which could then be proposed as a set of methods taught as disciplines. Rather than distinguishing between entrepreneurs based on personality traits, cognitive researchers have identified patterns in their thinking and have begun to hypothesize that certain ways of thinking are sources of competitive advantage and individual differentiation⁷.

^[4] Bygrave, W.D., and Hofer, C.W. 1991. Theorizing about entrepreneurship. *Entrepreneurship Theory and Practice*, 16(2), 13-22.

^[5] Shane, S., and Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-26.

^[6] Shane, S., and Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-26

^[4] Bygrave, W.D., and Hofer, C.W. 1991. Theorizing about entrepreneurship. *Entrepreneurship Theory and Practice*, 16(2), 13-22.

^[7] Mitchell, R.K., Smith, J.B., Seawright, K.W., and Morse, E.A. 2000. Cross-cultural cognitions and the venture creation decision. *Academy of Management Journal*, 53(5), 974-93.

At the same time, there is a stream of research based on cognition and thinking, which aimed at removing barriers to entrepreneurship and answered questions that arise from people who intend to engage in entrepreneurial activity⁸. In other words, the question was no longer whether a person could be an entrepreneur, but how he could become an entrepreneur, create opportunities and act on them.

The answer to this question was the theory of the authorship effect of Saraswati⁹, who empirically found that effective entrepreneurs see the world as open to many opportunities, invent and recognize new opportunities, create rather than find markets, accept, and exploit failures and interact with many stakeholders - all for goals of creating the future, not trying to predict the future¹⁰.

The discovery by Saraswati of the patterns of thinking entrepreneurs, combined with additional research, prompted thinking about taking entrepreneurship education to the next level. Based on the theory of the Saraswati effect, the opinion arises that entrepreneurship can no longer be taught as a process, but should be taught as a method¹¹. The entrepreneurship method requires the development of a set of practices. Through these methods, students can think more entrepreneurially, which in turn can develop students' skills to act entrepreneurially.

According to Christopher Sladdin, a technology consultant at Gartner, today's "student entrepreneurs are creative individuals who strive to help others in their communities, and their start-up businesses do everything from web design to serving tea and coffee to developing innovative medical technology¹²." K. Sladdin conducted a series of interviews, based on which he made a number of conclusions, namely:

- 1** Change of motivation from exclusively monetary. Student entrepreneurship does not flourish from the desire to make money. The new generation of college entrepreneurs who start their business are driven by the potential to do better, create value for society and help those in need.
- 2** Entrepreneurship students are often motivated to do things differently, whether it be to gradually improve existing products and services, or to apply an alternative business model and mindset to solve a problem.
- 3** Student entrepreneurs break down communication barriers and encourage each other to work together.
- 4** At the heart of student entrepreneurship is the community, its dynamics and interests. Some of the entrepreneurial ideas are drawn from the desire to help the community in solving practical problems¹³.
- 5** With so many entrepreneurial students involved in entrepreneurship education programs, it is imperative that program managers, mentors, and other stakeholders understand their participants.

[8] Sari Pekkala Kerr William R. Kerr Tina Xu. Personality Traits of Entrepreneurs: A Review of Recent Literature // Harvard business review, Working Paper 18-047.

[9] Sarasvathy, S.D. 2008. Effectuation: Elements of Entrepreneurial Expertise. Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing

[10] Sarasvathy, S.D. 2008. Effectuation: Elements of Entrepreneurial Expertise. Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.

[11] Venkataraman, S., Sarasvathy, S.D., Dew, N., and Forster, W.R. 2012. Reflection on the 2010 AMR decade award: Whither the promise? Moving forward with entrepreneurship as a science of the artificial. Academy of Management Review, 37(1), 21-33.

[12] <https://mystudentvoices.com/understanding-the-student-entrepreneur-64bdd87d0c4a>

[13] <https://mystudentvoices.com/understanding-the-student-entrepreneur-64bdd87d0c4a>

Thus, the vectors for the development of student entrepreneurship are associated with the improvement of methods of entrepreneurial education, personal characteristics of entrepreneurs, including their motives for choosing just such a path of work.

A complicating factor is the fundamental impossibility of transferring the experience of entrepreneurship from one person to another without distortion, which imposes requirements on entrepreneurial education. Methodists, teachers, mentors, and students themselves are forced to constantly experiment, look for ways to master this difficult skills and competencies.

As a result of many years of development in the field of entrepreneurial education, work on universities, local government bodies, corporations, national governments, foundations, an extensive system of support for student entrepreneurship has been formed. Separate areas of support and different approaches have appeared and have emerged. Among them are ecosystem approach, special programs, and strategies at the level of national authorities, tailored university projects, community building and networking, infrastructure support, practice-oriented projects in different industries.

Each element of this large structure allows a student to gain a personalized set of competencies and experiences that are so necessary on the path to business success in a dynamic and constantly changing market.

Netherlands is distinguished by high entrepreneurial activity. According to the Global Entrepreneurship Monitor, the Netherlands National 2019 report, in 2019 21,2% of the adult population (18-64 years old) were involved in entrepreneurial activity. Talking about youth entrepreneurship 14,8% of the population between 18 and 24 years old were involved in entrepreneurial activity. Among them 0,6% had an established business (functioning more than 3,5 years) and 14,2% of them were early-stage entrepreneurs. Comparatively, in general the rate of entrepreneurial activity in EU among the adult population was 17,7%¹⁷.

FRANCE

To address the employment crisis, the French government is developing initiatives to encourage entrepreneurship, including the creation of student centers for innovation, transfer and entrepreneurship (Pôles Étudiants Pour l'Innovation, le Transfert et l'Entrepreneuriat - PÉPITE), as well as entrepreneurship training aimed to raise awareness among teachers and lecturers, holding annually school business week and etc.

In 2014 the Ministry of education, research and innovation created the first PÉPITE. The center has an accelerator, legal, administrative and financial support, coworking space, funds and different competitions. Now there are 33 PÉPITE centers across the country¹⁸.

Also in 2014 within the framework of the action plan for the development of an entrepreneurial culture and teaching innovation, the status of a student-entrepreneur was introduced so that the student can be engaged in studies and run an entrepreneurial project at the same time. Student entrepreneur status allows to:

- Make the project tangible and trustworthy for banks, suppliers or customers
- Receive regular support from experts and teachers
- Access the PÉPITE coworking space
- Networking in the startup community
- Adjust studies at the university: business projects can replace compulsory internships
- For graduates - receive student social benefits (allowance and insurance)

Due to the determined requirements at the national level for educational program, to study with student entrepreneur status and take a diploma is possible at every university in France. In all the universities entrepreneurial programs have the same structure of courses and application process. Education of student-entrepreneurs is a joint activity of university and PÉPITE center.

The terms of the Program:

- A student of any age or a graduate up to 28 years old can enroll
- The student entrepreneur must have a business idea that has been selected by a jury from PÉPITE
- The status is given for 1 year

^[17] <https://www.gemconsortium.org/report/gem-netherlands-2019-report>

^[18] <https://www.pepite-france.fr/pepite-france/>

- Must attend evening classes in strategy, marketing, business modeling, accounting, management, finance techniques, intellectual property, corporate law and communications
- A mentor (representative from business) and a scientific advisor (university teacher) are attached to each project
- When issuing a diploma, attendance, viability and progress of the project are taken into account¹⁹

NETHERLANDS

According to Agenda StartUpNL government put in place the special enterprise accreditation system for entrepreneurial studies²⁰.

Also, the government has a list of things that need to be made to close the gap between education and industry. They point out following steps:

1. Teaching entrepreneurial skills. Entrepreneurs as a vital part of economic growth need to understand how the economy, legal system, tax system, and marketing work. For that universities should incorporate entrepreneurial skills into their curriculum or having students follow a course given by a guest lecturer from industry.
2. Combining studying with running a business. Universities should help student entrepreneurs by adjusting their programmes, for instance, allowing real-life business assignments to count as study credits. Or by letting final-year students keep a greater share of the profit from their business, without losing their eligibility for student finance.
3. Better links between education and the labour market.
4. More qualified technicians²¹.

Half of measures for closing the gap between education and industry are connected with student entrepreneurship which tells us that they see student entrepreneurship as a way to make higher education more practical oriented.

Also there are two informational resources. First is for students who think about entrepreneurship. There student can find checklist on how to start a company, in which case you can lose your student scholarship, and what to do if you are a minor²². The second one is for students who are entrepreneurs. There students can find the same information as on the first page and also subsidies and tax schemes, list of entrepreneurial support organizations²³. Having a clear one source with a description of what you should do and where to go in case of problems is an easy but effective way of promoting entrepreneurship.

These two cases are highlighting measures taken in circumstances of the different scope of entrepreneurial activity in a country. The extent of considering entrepreneurship as a

^[19] <https://bpifrance-creation.fr/encyclopedie/porteur-projet-preparation-droits-obligations/situation-droits-obligations/statut>
<https://www.enseignementsup-recherche.gouv.fr/cid79223/pepite-poles-etudiants-pour-L-innovation-le-transfert-et-L-entrepreneuriat.html>
<https://www.enseignementsup-recherche.gouv.fr/cid79926/statut-national-etudiant-entrepreneur.html>

^[20] <https://www.government.nl/documents/parliamentary-documents/2014/07/28/letter-to-parliament-about-ambitious-enterpreneurship>

^[21] <https://www.government.nl/topics/enterprise-and-innovation/closing-the-gap-between-education-and-industry>

^[22] <https://business.gov.nl/starting-your-business/various-starting-points/starting-a-business-as-a-student/>

^[23] <https://business.gov.nl/starting-your-business/various-starting-points/information-for-student-entrepreneurs/>

professional path is rather lower in France. Having faced an employment challenge France government has chosen to focus on entrepreneurship development as a possibility to create workplaces and contribute into the national economy growth. The solution was to build the whole ecosystem by designing centers PÉPITE, entrepreneurship educational programs in universities and student-entrepreneur status. Measures that result in increasing number of starting entrepreneurs career among young people. In Netherlands levels of entrepreneurship performance are high. Nevertheless, there are high-precision supportive measures like having an informational resource for students with practical guidance and information referring to entrepreneurship education, and measures for enhancing entrepreneurship university educational programs by deepening links with industry and business.

2.1.2 Measures to support student entrepreneurship at the regional and city levels

Initiatives on regional and city level are aimed at encouraging, inspiring and educating students. There are entrepreneurship centers that provide more hands-on support but they are in general for entrepreneurs and not only for students so they will not be reviewed here.

Junior Achievement Europe (EU)²⁴

Junior Achievement (JA) is a worldwide network of national Junior Achievement chapters promoting entrepreneurship education. At the European level, JA Europe has 40 national chapters and is the largest non-profit organisation in Europe bringing together the public and private sectors. The goal is to foster innovative thinking and improve young people's work and life skills through experience and practical activities. Students engage in the local community and encompass international actions, through initiatives such as Social Innovation Relay (SIR) or Social Enterprise 360 (SE360). SIR is an idea creation exercise designed to stimulate creativity through an international online innovation camp supported by business mentors. SE360 is a series of talks with social entrepreneurs where they explain their journey, business models, failures and lessons learned. By combining social ideation and business development, students gain skills and knowledge in identifying social business ideas and turning them into real businesses.

Student Entrepreneur Alliance (Ghent, Belgium)²⁵

In 2012 the city of Ghent in collaboration with Durf Ondernemen²⁶ at Ghent University, Centrum voor Ondernemen at Hogeschool Gent, Idea Factory at Artevelde Hogeschool and imec²⁷ created Student Ghentrepreneur Alliance in order to support student entrepreneurship and make it "as hip as bands used to be".

The European Commission, the Flemish government and higher education institutions (HEI) involved in this initiative shared the expenses. HEI also provided human and intellectual capital.

In 2016 a co-working space was opened at Ghent University called the Foundry.

^[24] <http://www.jaeurope.org/>

^[25] https://www.ub-cooperation.eu/pdf/cases/W_Case_Study_Ghent.pdf

^[26] the centre of expertise for student entrepreneurship at Ghent University. The centre aims to develop student-entrepreneurship, entrepreneurial education and building a creative community

^[27] (formerly iMinds) - a government-funded digital research and entrepreneurship institution, which supports start-up projects. It comprises 5 research departments (Digital Society, Security, Multimedia Tech., Medical IT and Internet Tech.), which are subdivided into 21 research groups. Its researchers (about 900) are part of the 5 affiliated Flemish universities



The Ghentrepreneur ecosystem offers a variety of support activities such as coaching and mentoring, counselling, support for cooperation, soft skill training, workshops, 20 free places for the imec entrepreneur conference, and specific training in sales, marketing, branding, usability, pitching and funding. In order to facilitate the conversion of theoretical ideas into practice and to attract risk averse students, some partners also cover legal and financial risks (e.g. using a billing centre for students).

In 2015, Student Ghentrepreneur launched the Starter Portfolio (de startersportefeuille). Depending on the phase of their project, local students can receive a “starters wallet” of €500 for student who do not have a student entrepreneur status²⁸ and up to €3,000 for registered student entrepreneurs. This virtual budget can be used for professional advice from 30 experts as well as conference tickets and exclusive opportunities from business partners.

Both cases show the measures that allow to include students into the current regional entrepreneurial ecosystems via inspiring them by the experience of prominent entrepreneurs, networking, getting expert support.

2.1.3 Student entrepreneurship support measures at the university level

The necessary knowledge and skills is a basement for starting a business or acting entrepreneurially universities strive to offer their students with entrepreneurship-related courses. The number of the courses in EU dramatically increased over the past two decades²⁹. Entrepreneurship courses, training, extra-curricular support and activities, facilities and capacities for entrepreneurial activities create a supportive context for entrepreneurship at universities, moreover that strengthens students’ motivation and capability for starting a business. It is worth noting that most students do not start a business directly after completing or during their studies, they might postpone entrepreneur career to a later stage in their life. Accumulating entrepreneurial experience during their studies facilitates entrepreneurship of students and graduates³⁰.

[28] Student entrepreneur status is more or less the same as the one mentioned in France. This status offers a higher degree of flexibility in their study programme and allows them to shift exams.

[29] European Commission. (2012). Effects and impact of entrepreneurship programmes in higher education. Brussels.

[30] Global Student Entrepreneurship 2018: Insights From 54 Countries 2018 GUESSS Global Report Philipp Sieger / Urs Fueglistaller / Thomas Zellweger & Ilja Braun

In an unpredictable post-pandemic world, universities have to offer curricula, opportunities and incentives to create a new generation of entrepreneurs who will determine their own career paths. In this sense, some students will not necessarily start their own companies. But even working in a large corporation or being in the public service, they will maintain an entrepreneurial mindset, and look for non-trivial solutions to their tasks.

Universities encourage student entrepreneurship as much as they can. In general support system can be divided on:

- design and teach educational programs on entrepreneurship
- organize meetings with mentors, staff and faculty
- establish venture funds
- simplify the procedures related of establishing spin-offs and use of a university's intellectual property
- launch business accelerators, business incubators, science and technology parks
- provide for open exploit infrastructure: coworking spaces, fablabs, etc



MIT (USA)

MIT has a wide range of entrepreneurial support integrated. The more detailed description of some its elements, namely, MIT Entrepreneurship Club, MIT Industrial Liaison Program, and accelerator Delta v will be covered in other Chapters.

Innovation ecosystem in MIT could be divided on following categories:

- Student clubs are student-led organizations with different focuses and types of activities, regarding the student entrepreneurship it is worth mentioning industry-focused clubs. In total there are around MIT student-led 450 clubs, at MIT Sloan School of Management there are industry-focused clubs (for instance, Education Club, Entrepreneurship Club, Family Business Club, Finance and Policy Club, FinTech Club, Global Macro Investing Club, Infrastructure and Project Finance Club, Investment Banking Club and others)
- Labs
- Acceleration programs, bootcamps

- Venture funds
- Entrepreneurship competitions
- Mentoring service
- Women support resources
- Programs meant to inspire students to invent and innovate
- And programs directed at fostering community, networking³¹

Among all measure applied at MIT it is interesting to look thoroughly mentoring service - as it is one of the efficient ways to assure confidence in nascent or early-stage entrepreneurs and to make sure that they will make less mistakes - and entrepreneurship competitions - that are aimed at solving global challenges that enhance the raising awareness of them and their significance for the modern societies.

MIT Venture Mentoring Service uses a team mentoring approach with groups of 3 to 4 mentors sitting with the entrepreneur(s) in sessions that provide practical, day-to-day professional advice and coaching. Mentors are selected from a wide range of business activity areas, such as product development, marketing, intellectual property law, finance, human resources, and founders issues. This service is only for MIT students, alumni, faculty and staff in the Boston area and is offered free of charge³².

The main service provided by Venture Mentoring Service is team mentoring sessions. But they also provide other mentoring services:

One-on-One Mentoring Sessions

VMS Venture Mail List - is a way to connect with other entrepreneurs and advise each other

VMS Office Hour Programs - is a 30-minute appointment with experienced professionals to discuss the following topics: legal issues, intellectual property, accounting, government contract, immigration law, human resources, user experience

Entrepreneurial Edge Event - annual networking reception

Venture to Mentor Link - bi-annual networking event to introduce 15 or so invited ventures to the mentor group

MIT VMS Boot Camps - seminars/panel discussions in which mentors share their knowledge and expertise on the following topics: sales, human resources, intellectual property, marketing

Ventureships Club - connects students with MIT-affiliated early-stage startup companies to work on real-life business issues such as market analysis, financial forecast, regulatory approval, business development, marketing, and more

Snapshot Pitch Presentation - monthly pitch session event

VMS Demo Day - showcase of ventures that seek funding

Discounts - participants are eligible for a number of discounts and programs through Venture Mentoring Service

STEX25 Nominating Partner - startups are periodically nominated to participate in the MIT Startup Exchange's STEX25 Startup Accelerator³³

^[31] <https://innovation.mit.edu/resources/>

^[32] <https://vms.mit.edu/mit-venture-mentoring-service>

^[33] <https://vms.mit.edu/mit-venture-mentoring-service/vms-program-offerings>

The variety of forms for mentoring allows to tailor them for the demand and needs of the students, the outcome of these activities is an equipped student with the knowledge for either entrepreneurial career or employee career with proficient competencies in entrepreneurship.

Speaking about the entrepreneurial competitions due to which a student gains the so desired in real-life skills like to reply on the challenge in a short period of time, ability to formulate a problem, setting aims and seeking for the best appropriate solution, there are two challenges aimed at solving global problems: **MIT Solve** and **IDEAS Social Innovation Challenge**.

MIT Solve is looking for lasting ideas to tackle global problems and change the world. It was created in 2015 by the Office of the President of MIT. "We will do more than talk about the greatest problems facing our world. We will set the course to solve them³⁴" – L. Rafael Reif, President of MIT.

Each year there are several problems selected. In 2021 they are:

1. Digital inclusion. How can everyone have access to the digital economy?
2. Equitable classroom. How can all young learners have access to quality, safe, and equitable learning environments?
3. Resilient ecosystem. How can communities sustainably protect, manage, and restore their local ecosystems?
4. Health security and pandemic challenge. How can communities prepare for, detect, and respond to emerging pandemics and health security threats?
5. Antiracist technology in the US. How can communities of color use technology to advance racial equity and access economic opportunity, health, and safety?
6. 2021 indigenous communities fellowship. How can Native innovators in the US use traditional knowledge and technology to meet the social, environmental, and economic goals of their communities³⁵?

The participation in MIT Solve is open for anyone around the world. Solutions can be at any stage from concept to scale. Winners will not only get cash prize (more than \$1.5 million) but also help from the MIT partners community to scale up the impact.

The IDEAS Social Innovation Challenge addresses social and environmental challenges around the world. Projects are evaluated on three dimensions: innovation, feasibility, impact.

Each team that is applied must be led by one or more full-time MIT students for the duration of the application process. In this challenge can compete only those projects that have not acquired significant investment (>\$100,000).

^[34] <https://solve.mit.edu/about>

^[35] <https://solve.mit.edu/challenges>

Winners will get mentors support and funding within the range of \$1,000 - \$20,000. But funding will go to the MIT student(s) on the team, not to an organization that has been created³⁶.

Integrating entrepreneurial competitions into the system of support measures for developing entrepreneurial skills belongs to the informal channels of acquiring skills and knowledge that are demanded for success at the labor market in the independent self-employed status as an entrepreneur or an employee. Such skills as setting aims and tasks, team working, brainstorming, and working out the decision in the limited period, coping the stress, presenting skills.

Tangible deliverable of the participating in them for students is to get funding for the further development of the idea. MIT case shows the advantages of the challenge competitions for participants as well as for the university, and at the higher level - society impact.

2.1.4 Universities entrepreneurial strategies as a support measure for student entrepreneurship

Entrepreneurial student activities take place in a social, organizational, and spatial context. Organizational context represents a set of opportunities and limitations that influence the occurrence and meaning of organizational behavior³⁷. Both students' human capital which consists of personal characteristics and obtained during education skills and knowledge as well as entrepreneurial motivation are significantly affected by the university environment. Universities ambitiously set in their strategies the desired goal to enable students become entrepreneurs through equipping students with the necessary knowledge, skills, and motivation for starting a business by offering entrepreneurship courses and training. A better understanding of contextual framework depicted in the university strategy helps to design conditions that foster entrepreneurial activities of students, thus the cases with the entrepreneurial strategies will be presented below.



^[36] <https://pkgcenter.mit.edu/programs/ideas/>

^[37] Heiko Bergmann . Christian Hundt . What makes student entrepreneurs? On the relevance (and irrelevance) of the university and the regional context for student start-ups Rolf Sternberg Accepted: 19 January 2016 / Published online: 4 February 2016 / Springer Science+Business Media New York 2016 // Small Bus Econ (2016) 47:53–76 DOI 10.1007/s11187-016-9700-6

^[38] <https://www.murdoch.edu.au/docs/default-source/research/innovation-and-entrepreneurship-strategy-2018-2023.pdf>

Murdoch University has an Innovation and Entrepreneurship Strategy 2018-2023. The strategy addresses 6 key objectives to generate interest in innovation and entrepreneurship:

- 1** Create visible and accessible expert teams to support industry and students, staff, and faculty
- 2** Develop systems and frameworks that maximize awareness of university's capabilities and inventions and match these to external needs and opportunities
- 3** Promote an ongoing program of education, including research, innovation, and entrepreneurial training, that supports staff and students
- 4** Build a co-learning innovation hub that is well connected to similar hubs locally, nationally, and internationally
- 5** Recognize and embed engagement, innovation, entrepreneurship, and translation activities in staff training within the Contribution Development Reviews (CDR) and within the promotion processes
- 6** Create an innovation fund for selective early-stage investment

To achieve the objectives Innovation Co-Learning Hub has been created at Murdoch University (figure 1).



Figure 1. Innovation Co-Learning Hub

The first part of Innovation Co-Learning Hub is an education program, that is aimed at developing an ongoing education program for staff and students incorporating workshops and online learning tools to build the knowledge, skills and behaviours - understanding the needs of industry and markets, intellectual property protection, building a team, pitching to an investor, etc.

The second part of Innovation Co-Learning Hub is a framework and tools due to which the university endeavors to integrate with industry bodies and associations and to equip

students and staff with tools for capturing, managing and exploiting intellectual capital such as an invention management tool, support network that maps all the assistance available in the research and innovation area, and a matchmaking tool that identifies potential investors.

The third part of Innovation Co-Learning Hub is the governance and innovation fund. Innovation Hub will have space to meet innovators and showcase for visitors, research accelerator, interactive virtual environments. Also, they will establish early and mid-stage investment funds.

The fourth part of Innovation Co-Learning Hub is the expert programs. Students and staff need expert team's assistance, such as: legal (patent) and commercial experience team, team of industry engagement advisers, team of consultants able to provide market intelligence as a guide to investment, experts seconded from industry, entrepreneurs in residence, collaborator from a world leading innovation center.

The fifth part of Innovation Co-Learning Hub is a reward framework. To establish reward policy the university will create a career promotions pathway, clearly linked to the National Innovation and Science Agenda, a workload model that includes consultancy as an important use of staff time, clear administrative process, a system of remuneration that protects the University's reputation, whilst allowing academics to benefit directly from consultancy income, a Graduate Research Degree (GRD) training program that recognizes the ACOLA principles of Industry engagement, internships, and industry-based supervision.

Thus, Innovation Co-Learning Hub presents full-fledge set of knowledge and expertise at the level of a university that builds the university climate favorable for student entrepreneurship that transmit to a student the high extent of support from the university for becoming an entrepreneur.



^[39] https://www.strath.ac.uk/media/1newwebsite/strathclydeinspire/Entrepreneurship_Strategy_2020-2025.pdf

Developing entrepreneurial mindsets	Identifying & supporting entrepreneurial talent
Empowering entrepreneurs	Scaling innovation-driven enterprises

Figure 2. Entrepreneurship Strategy 2020-2025 Goals, University of Strathclyde (Scotland)

They set 4 strategic goals (Figure 2.):

1. Developing entrepreneurial mindsets. Objectives are:

- a.** Integrate Innovation, Creativity and Entrepreneurship module into every undergraduate course.
- b.** Proactively expand postgraduate entrepreneurship offering.
- c.** Create and offer a new Entrepreneurship MOOC for all students and staff.
- d.** Launch a careers-based service promoting entrepreneurship as a career option and offering a range of inspirational events and interactive programs designed to encourage ideation and creativity.
- e.** Package and promote an already extensive range of opportunities.
- f.** Invite all new staff to learn about Strathclyde Inspire as part of the new staff induction process.
- g.** Promote, to all staff, a range of in-depth and specialist continuing professional development opportunities including Entrepreneurial Thinking & Behaviours and IP & Commercialisation.

2. Identifying & supporting entrepreneurial talent. Objectives are:

- a.** Embed staff and student entrepreneurship ambassadors in every Department across the University.
- b.** Launch a new start-up program giving all students, staff, alumni and external partners the opportunity to validate commercial ideas and compete for small amounts of funding.
- c.** Appropriate intellectual property protection and a platform for students and staff for reviewing challenges and opportunities as they progress to license deals or spin-out company formations.
- d.** Welcoming start-up zone in the new Entrepreneurship Hub where emerging entrepreneurs can access on-site advisors, meeting space and hotdesking facilities, while networking with entrepreneurial peers.
- e.** Provide all identified talent with one-to-one support to help with the next stage of venture creation and growth.

3. Empowering entrepreneurs. Objective is:

- a.** Deliver a competitive investor-ready accelerator program which provides high-growth opportunities.

4. Scaling innovation-driven enterprises. Objectives are:

- a.** Allocate a £7.5M for investment in companies created by Strathclyde students, staff, alumni and strategic partners.
- b.** Engage with alumni and partner communities to create an enhanced Fund for early-stage seed investment of up to £100K in new companies created from the Strathclyde entrepreneurial community.
- c.** Engage and support any early-stage innovation-driven business to scale through Growth Advantage Program.
- d.** Welcoming facility in the new Entrepreneurship Hub where local businesses can explore ways in which engaging with the University's innovation services could support their growth aspirations.

To achieve that there were elaborated the three cross-cutting initiatives:

1. **Entrepreneurship Hub.** Development of the University's Technology and Innovation Zone in Glasgow City Innovation District.
2. **Blended Events Program.** Educational, networking offline and online events.
3. **Global Supporter Network.** Fostering a pool of experienced entrepreneurs and experts who will provide strategic input, specialist advice and access to markets, encouraging and supporting the next generation of Strathclyde entrepreneurs.

The case of University of Strathclyde Entrepreneurship Strategy brightly demonstrates the awareness and necessity of the multi-directive approach for the supporting student entrepreneurship from the growing entrepreneur mindset to networking, strong connections with business and local communities, through assisting launched by the students and operating start-ups and companies to the engaging and keeping touch with the alumni who contribute by being technological entrepreneurs into the university innovation and entrepreneur ecosystem, enhancing in the long-term perspective the impact of the entrepreneurial university climate.

Student entrepreneurship is strongly supported at the university level. At the national government level there is as a rule stating and admitting the importance of student entrepreneurship that serves a basement for further practical measures of supporting the development of student entrepreneurship. So, France has a bigger support at national level and university entrepreneurial actions and strategy are aligned with the state policy. Moreover, it has standardized entrepreneurial educational programs throughout the country at the level of program structure and obligatory services like mentors' support. Student entrepreneur status gives social benefits and thus young entrepreneurs are interested in obtaining the needed education. In the Netherlands there is also a governmental standard of entrepreneurial education. They also use an easy but effective one-page governmental source explaining what students need to know about opening a business.

There are measures for supporting and encouraging students to become entrepreneurs at a regional and city level. One of the popular forms of them is short-term educational courses. Long-term support exists in a form of supporting infrastructure such as entrepreneurial centers that any city / region entrepreneurs can use, including students. Universities nurture the entrepreneurial dimension in their students by preparing them for the ever-changing labor market.

So that they will be able to build career path. For achieving that universities have educational programs, entrepreneurial events, student clubs, co-workings, accelerators, incubators, etc.

2.2. Opportunities and Limitations of Existing Management Approaches to the Development of Student Entrepreneurship

There are many approaches to managing the development of student entrepreneurship. The need to develop entrepreneurial skills is often linked to the spread of the generational transition paradigm. Focusing on the needs of future generations creates a demand for a new set of skills that will fit the markets of the future. Many methods of supporting student entrepreneurship complement each other - this can be direct financial incentives, access to mentoring and networking, or professional development of the startup team / founder.

According to the authors of the WEC article⁴⁰, the main ways of encouraging student entrepreneurship are opportunities for communication and mentoring, as well as providing access to special infrastructure, getting to know local entrepreneurs, awarding prizes and offering programs from venture funds.

Most importantly, student entrepreneurial teams make a significant contribution to the formation of the image of the dynamics and innovation of the university, and clearly demonstrate their social and economic contribution.

Student entrepreneurship is valued as an important part of the university community, which contributes to the development of the university as a whole. Such teams help to establish and use international relations of the university, and some in the future may become an important part of the alumni community, donors and philanthropists of the university and the local community.

Further, various *management approaches* to the development of student entrepreneurship from different positions are considered, namely:

- 1** *educational university approach*, i.e. management of student entrepreneurship development through specialized university educational programs
- 2** *an ecosystem-based university approach*, when the development of student entrepreneurship is managed through a series of services with the involvement of external partners, occasional and permanent events, providing access to equipment, premises, infrastructures, as well as consulting and mentoring
- 3** *youth social entrepreneurship* as a special form of entrepreneurship, which is often supported by the local community, region, city
- 4** *competitive initiatives* at global and regional levels

A number of management approaches place the university in a subject position, in which it forms an environment that encourages entrepreneurship; in other approaches, the coordinator of the process is an international fund, NGOs, and regional authorities. In any case, the student, as an end subject and user of these support programs, chooses the combination of services that suits his/her entrepreneurial project at the moment.

Approach 1. University entrepreneurial education approach

The earliest and most widespread form of support for student entrepreneurship has become a specialized business, economic or specialized entrepreneurial education, which is designed to prepare top managers and business owners for direct employment.

^[40] <https://www.weforum.org/agenda/2020/10/universities-should-support-more-student-entrepreneurs/>

These can be:

1. programs of business education, MBA, economic education
2. programs of engineering, natural science and humanitarian education with the possibility of protecting a startup as a diploma
3. individual entrepreneurial courses or extracurricular initiatives within the general educational process of managers, innovation managers, economists, marketers,

Educational programs of university entrepreneurship education are described in more details in the section 2.6. "Educational programs, initiatives and additional vocational education in the system of university education in the context of the development of student entrepreneurship".

From 2016 to 2019, based on the results of the ERASMUS SUCCESS4ALL project⁴¹, best practices in entrepreneurial education were collected. The study is a compilation of good practices, a preamble with conclusions and a detailed description of each case, which includes a link to the current institution, a summary of teaching techniques, objective learning outcomes, and concept details that facilitated the implementation of an entrepreneurship education program. The authors' general pedagogical approach to entrepreneurship education is based on the recognition that potential entrepreneurs require not only knowledge and tools, but also the authority to make their own decisions, on which individual experience is formed. In addition, **the study speaks about the importance of inclusiveness in entrepreneurship issues and positions student entrepreneurship as a positive experience and an opportunity for self-realization, incl. for people with disabilities.**

Gathered by the ERASMUS SUCCESS4ALL project key messages combine **a series of best practices into recommendations for educational institutions that form appropriate training programs:**

- Firstly, the student must know that entrepreneurial success is basically available to them
- Secondly, the student must believe that he/she has the necessary qualities to succeed
- Thirdly, the student must learn the process of becoming an entrepreneur
- Fourthly, the student must learn tools and techniques for entrepreneurial success
- Finally, the student must learn about potential barriers and resources to overcome them

For a long time, entrepreneurial education and student entrepreneurship have been perceived in the scientific psychological discourse as a type of activity, the disposition to which is determined by the type of personality and character traits. Thus, **it was assumed that it was impossible to teach entrepreneurship**. In 1988, Lowe and MacMillan argued that any attempt to articulate a set of personality traits for the typical entrepreneur is inherently futile and postulated that for practical progress it is necessary to engage in skillset research rather than typing the entrepreneur's personality⁴². However, research in this direction continued for quite a long time, which fueled a negative image of student entrepreneurship and entrepreneurial education in general, a low level of trust in such initiatives.

[41] http://success4allstudents.eu/wp-content/uploads/2017/12/Intellectual-Output-3_EntrepreneurshipBestPracticesFactbook_ENG.pdf

[42] Low, M.B., and MacMillan, I.C. 1988. Entrepreneurship: Past research and future challenges. Journal of Management, 14(2), 139-61

For example, Miner in 1996 proposed four psychological patterns of entrepreneurial personality: personal advisors, empathetic super-sellers, real managers, and idea-generating experts⁴³. Fischer and Koch (2008), in their book *Born Not Created*, take us back by arguing that there is a personality profile, but their profile is strongly influenced by their risk taking⁴⁴. In addition, as recently as 2010, the role and presence of the entrepreneurial gene was postulated under the authorship of Shane (Mount, 2010)⁴⁵. Such claims take the baseline versus parenting debate to new extremes, calling into question the possibility of student entrepreneurship education.

Thus, there are two opposite opinions: 1. **entrepreneurship is an innate set of qualities**, 2. **entrepreneurship is a type of activity**, for the implementation of which you need to have competencies, knowledge and a set of methods, which means it is **an activity that is mastered in the learning process like any other**.

The collision of these opinions is still a topical subject of discussion and limits the more active development of the student entrepreneurship market.

The next challenge facing the field of student entrepreneurship relates to **the methodological aspects of entrepreneurship research and the creation of appropriate educational products**. The behavior of various samples of entrepreneurs is very peculiar, so it is extremely difficult to generalize them for educational purposes. To prove this point, a 2008 study comparing textbook content to that of aspiring entrepreneurs concluded that there was very little overlap⁴⁶.

In our opinion, the complexity of the methodology should not lead to abandonment of attempts to improve methods of teaching entrepreneurship, on the contrary, it is a fruitful field of activity for ambitious methodologists and andragogy specialists who are looking for areas of professional challenge.

Thus, entrepreneurship education is one of the most common forms of stimulating entrepreneurship among students. Wide practice and a significant period of this practice allow making methodological generalizations and conducting research on the effectiveness of certain approaches, as well as drawing conclusions about recommendations for entrepreneurial education.

Among the limitations of entrepreneurial education, it is necessary, first of all, to highlight the methodological complexity - the complexity of the subject and the multicomponent nature of those skills that must be passed on to the student in the learning process. In many ways, each entrepreneur's journey is unique, and can hardly be described as a set of steps or techniques that are guaranteed to lead to success.

Approach 2. University entrepreneurial ecosystem approach

The university itself can act as a complex ecosystem, which to one degree or another includes both an educational component and a practical one - it contains an accelerator / incubator, maintains partnerships with businesses that may be customers or interests of student entrepreneurship.

^[43] Miner, J.B. 1996. *The 4 Routes to Entrepreneurial Success*. San Francisco: Berrett-Koehler.

^[44] Miner, J.B. 1996. *The 4 Routes to Entrepreneurial Success*. San Francisco: Berrett-Koehler.

^[45] Mount, I. 2010. Nature vs. nurture: Are great entrepreneurs born ... or made? *Fortune Small Business*, December 09/January 10, 25-6.

^[46] Edelman, L.F., Manolova, T.S., and Brush, C.B. 2008. Entrepreneurship education: Correspondence between practices of nascent entrepreneurs and textbook prescriptions for success. *Academy of Management Learning and Education*, 7(1), 56-70.

Elements of the University's entrepreneurial ecosystem can be:

1. Educational programs in entrepreneurship
2. Technological development support infrastructures available to students who want to start a technology startup or are already in the process of creating one
3. Business support infrastructures – both hard – in the form of accelerators, incubators with a formalized user path, and soft – consultation sessions, mentoring, mentoring clubs, business breakfasts and other communication activities
4. Financial instruments
5. Networks of partnerships with businesses, authorities, regional decision-making centers in order to collect a pool of requests from the market and have platforms for the practical application of entrepreneurial talents of students
6. Areas for social entrepreneurship, volunteering and extracurricular activities that may have entrepreneurial potential in the future
7. Providing the campus as a platform for technological and social experimentation

The research of Michael H. Morris, Galina Shirokova, and Tatiana Tsukanova begins with the idea that the choice of the entrepreneurial path can be dictated by the supportive environment created around the student⁴⁷. One of the possible management approaches here is the development of an “entrepreneurial ecosystem”⁴⁸. In this context, an ecosystem is defined as a collection of interrelated individuals, organizations, and authorities in a particular geographic area that collectively support entrepreneurial activity in the ways that are available to them and are specialized⁴⁹. Such ecosystems can exist at national, regional and community levels, but **university-level ecosystems are increasingly taking on a key role**⁵⁰.

At the same time, university ecosystems can operate at two levels:

1. they serve as one of the most valuable elements of regional ecosystems
2. build the brand of the organization and develop their own internal ecosystems

At the internal level, the following are important: the academic atmosphere, values and norms of knowledge, innovation and development, leadership and internal infrastructure, including educational and joint programs. At the same time, modern universities differ significantly in the degree to which entrepreneurship is recognized as an academic discipline or main area of study, as well as in their relative investment in developing a learning environment that supports entrepreneurial pursuits⁵².

[47] Morris, Michael & Shirokova, Galina & Tsukanova, Tatyana. (2017). Student entrepreneurship and the university ecosystem: A multi-country empirical exploration. *European J. of International Management*. 11. 65-85. 10.1504/EJIM.2017.081251.

[48] Lee, S. M., & Peterson, S. J. (2000). Culture, entrepreneurial orientation, and global competitiveness. *Journal of World Business*, 35(4), 401-416. [https://doi.org/10.1016/S1090-9516\(00\)00045-6](https://doi.org/10.1016/S1090-9516(00)00045-6)

[49] Malecki, Edward J., *International journal of entrepreneurship and innovation management*. – Milton Keynes : Inderscience Enterpr, ISSN 1368-275X, ZDB-ID 2054331-1. – Vol. 14.2011, 1, p. 36-59

[50] Feters, M., Greene, P.G. and Rice, M.P. (Eds) (2010) *The Development of University-Based Entrepreneurship Ecosystems: Global Practices*, Edward Elgar Publishing, Northampton, MA.

[51] WEF (World Economic Forum) (2014) *Entrepreneurial Ecosystems around the Globe and EarlyStage Company Growth Dynamics*, World Economic Forum, Geneva, Switzerland.

[52] Rideout, E. and Gray, D. (2013) 'Does entrepreneurship education really work? A review and methodological critique of the empirical literature on the effects of university-based entrepreneurship education', *Journal of Small Business Management*, Vol. 51, No. 3, pp.329-351.

Thus, the university environment can serve both to constrain and to create conditions for entrepreneurial behavior, while the extent of their impact, if any, remains unclear⁵³. This has prompted some researchers to call for further research on the role of the university context in encouraging student entrepreneurship⁵⁴.

The results of the study suggest the following⁵⁵:

1

The importance of the university context in the influence of the student on the choice of entrepreneurial activity is high. Success factors in promoting university entrepreneurial initiatives include tools such as specialized curricula, extracurricular activities, and financial support measures. The ultimate goal of all support tools is to foster the development of students' personal, social and financial capital.

2

The authors suggest using their research findings with caution, as universities continue to simply add to the number of elements that make up their entrepreneurial ecosystems. At the same time, [there is a need to create an efficiently operating ecosystem that would meet the needs of specific target audiences](#). Students vary considerably in their background, level and type of experience, as well as their ability to time management and self-regulation when it comes to entrepreneurial careers. The conclusion is not to exclude such programs, but it is better to integrate them with other elements of the ecosystem and link them into a single set of educational, methodological and practical classes.

3

University ecosystems can have an important influence on student entrepreneurial behavior, but must reflect the learning needs of different groups of students. Experiential learning is an important component of an ecosystem, but not an exclusive element. The potential for hands-on, project-based learning can be increased in combination with other tutorials.

4

Entrepreneurial activity is more actively carried out by senior students, and the volume of startups created is equally positively influenced by: 1) academic specialization "business and economics" and the like, as well as 2) the student's belonging to a family with entrepreneurial experience.

5

Undergraduate and female students are generally less active in entrepreneurship.

6

As expected, students' personal performance has a positive effect on the number of student startups.

[53] Matlay, H. (2008) 'The impact of entrepreneurship education on entrepreneurial outcomes', Journal of Small Business and Enterprise Development, Vol. 15, No. 2, pp.382-396.

[54] Fayolle, A. and Liñán, F. (2014) 'The future of research on entrepreneurial intentions', Journal of Business Research, Vol. 67, No. 5, pp.663-666.

[55] Morris, Michael & Shirokova, Galina & Tsukanova, Tatyana. (2017). Student entrepreneurship and the university ecosystem: A multi-country empirical exploration. European J. of International Management. 11. 65-85. 10.1504/EJIM.2017.081251.

7 Student participation in university programs related to entrepreneurship has a significant positive impact on the volume of student entrepreneurship, and it is most powerful if students have no business experience.

8 Involvement of students in joint entrepreneurship programs has a positive effect on entrepreneurial activity, and it is most powerful if students have no business experience.

9 The provision of financial support by the university to entrepreneurship is negatively related to the volume of entrepreneurial activity of students. At the same time, the impact of existing financial support programs on the volume of entrepreneurial activity is weaker when students have no previous business experience.

Thus, we can conclude that the formation of an ecosystem for supporting entrepreneurship at the university is a positive and largely effective approach to stimulating students to create their own business projects, but there are risks associated with the motivational component, the relationship between the ecosystem and the educational process, and overall efficiency. ecosystem management. An unexpected but important finding was the negative impact of financial support on student entrepreneurship. It can be assumed that quality educational and empirical support, counseling, networking is more important than direct funding.

Approach 3. National programmes/strategies

Youth entrepreneurship can be the subject of government policies, plans and programs. Basically, this type of initiative is carried out within the framework of broader programs to improve the quality of higher education in general. In such cases, a special strategic planning document and an action plan are established to achieve the indicators within the stated time frame. In addition, the implementation of such a national initiative is monitored by the responsible state authority.

For example, student entrepreneurship was included in the National strategy for access and student success in higher education in the UK. There is also a role for the HE sector in further supporting and encouraging students into entrepreneurial activity throughout their study and beyond. HEFCE (Higher Education Funding Council for England) is currently undertaking some research on student start-ups which will help institutions to develop possible approaches⁵⁶.

Case. NACUE – National Association of College and University Entrepreneurs, UK⁵⁷

NACUE is an example of a grassroots initiative that has been implemented by activists from specific universities, has grown to a national-level network and has received government support.

[56] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/299689/bis-14-516-national-strategy-for-access-and-student-success.pdf

[57] <https://www.nacue.com/#>

NACUE is a leading student engagement charity. Working with college and university students, the organization provides young people with the opportunity to improve their skills, develop the necessary skills, self-confidence and form goals and aspirations through the entrepreneurial community, sharing experiences with other student entrepreneurs, hands-on programs and inspiring events. The organization's work is dedicated to supporting, connecting and representing student entrepreneurship societies and student entrepreneurs around the world. The purpose of the organization is to stimulate the entrepreneurial generation.

NACUE strives to support decision making and educational optimization in order to increase interaction with students from various academic circles, as well as through business initiatives to support student entrepreneurship. The organization posits that students should be able to take advantage of the unique opportunities of today, and that the community's job is to support them in developing the skills they need to succeed.

History of the organization

NACUE was founded in 2008 by the leaders of 12 different business associations from selected universities. These students had already played a leading role in the development of student entrepreneurship in the institutions where they studied, but they realized that more extensive collaboration was required and together they could create something more for the benefit of their societies. In 2009, Victoria Lennox, President of Oxford Entrepreneurs, took the plunge and founded an organization called the National Consortium of University Entrepreneurs.

NACUE existed as a predominantly volunteer-led organization until 2011, which was a year of rapid growth for the organization. NACUE relaunched as a charity in early 2011, then announced a major expansion with funding from the UK Department of Business, Innovation and Skills (BIS) and expanded to include continuing education colleges. On November 15, 2011, the organization's name was changed to the National Association of College and University Entrepreneurs to reflect their commitment to other levels of education in the sector.

These original 12 societies were catalysts for an unusual student entrepreneurship movement. This original group has now grown into a national non-profit organization with a thriving national network representing over 200 college and university business societies.

The charitable organization NACUE supports 32,000 students and young people annually. As funding becomes more difficult to obtain, the organization welcomes donors and expands its sources of fundraising to ensure that programs can continue to transform the dreams of the younger generation.

The **benefits** of having a national strategy or program in a focus area are a common approach and practice, a clear planning horizon and a set of performance indicators. On the example of the given case, one can see that national initiatives can be implemented in the bottom-up approach format, and not only implemented by the authorities from above.

The **limitations** of the approach to the development of student entrepreneurship through support at the national level can be: 1) the formality of execution, 2) limited access to the target audience, 3) lack of understanding of the pressing problems of the target audience in cases where an ecosystem of interaction of all stakeholders has not been built.

Approach 4. Worldwide youth engagement into social entrepreneurship

Social entrepreneurship is a form of business that attracts students with high social value, lower financial risks and the ability to test ideas of different sizes and required resources. Such initiatives are international in scope, as they solve global problems, respond to great challenges and have a positive impact on the quality of life around the world.

In this area, it is most difficult to separate youth entrepreneurship from directly student entrepreneurship, however, these are overlapping sets, so in this section we ignore the difference in these concepts.

As noted in the analytical report of the European Youth Education in Social Entrepreneurship (ELYSE)⁵⁸ project, according to practitioners, the main obstacles faced by young social entrepreneurs are irrelevant and unsuccessful business ideas (21%), difficulty in accessing funding (19%), insufficient support for social entrepreneurship and youth initiatives at the country level (9%), administrative and regulatory difficulties (6%), lack of business experience (6%) and lack of support from friends and family (6%) were suggested as a serious obstacle to youth social entrepreneurship.

Any strategy to support young social entrepreneurs should be organized in collaboration with other local organizations, schools, universities, community groups and should be based on a mixed model in which online tools are offered along with offline activities. The ideal support package for young social entrepreneurs should match the stage of development of the social enterprise. Several elements of support were mentioned by experts in interviews in the ELYSE project, and the data show that business education and business experience, business support in developing an entrepreneurial idea, and funding opportunities for the start-up phase of work are the most important for the support program. The organizations surveyed also mentioned mentoring, networking, coworking, and peer support.

Young social entrepreneurs will benefit from increased networking opportunities with other entrepreneurs (39%), the public sector (28%) and private companies (18%). Regarding the overall ecosystem of support and how to create a more social entrepreneurship-friendly environment for young people, the practitioners interviewed made it clear the importance of expanding funding opportunities for both young entrepreneurs and support organizations. Additional factors were selected for active participation of the government and local authorities and closer cooperation between practitioners⁵⁹.

To ensure greater youth participation, social entrepreneurship support organizations have formulated several recommendations⁶⁰:

- 1 First of all, stakeholders in 25% of responses noted the importance of cooperation in organizing promotional events to unite youth groups
- 2 Secondly, joining forces and building partnerships between local organizations with different backgrounds such as youth organizations, community groups, schools, universities, incubators was recognized as an important factor in order to ensure better reach of the audience, use the benefits of joining forces on one task and sharing resources

^[58] <http://www.gsen.global/wp-content/uploads/GSEN-Report-Design-5-forweb-2.pdf>

^[59] <http://www.gsen.global/wp-content/uploads/GSEN-Report-Design-5-forweb-2.pdf>

^[60] <http://www.gsen.global/wp-content/uploads/GSEN-Report-Design-5-forweb-2.pdf>

- 3 Thirdly, practitioners agreed (25% of respondents) with the power of a mixed model in which online tools such as social media, websites, online groups and communities, direct mail, are integrated with offline events and live interaction. to promote social entrepreneurship among youth.
- 4 Local activities that can be of interest to young people are very important. 17% of respondents suggested holding such events at the local level and in an informal setting and holding them regularly. Interactive activities and a learning-by-doing approach – such as organizing workshops, hackathons, business games in which young people are asked to actively participate and develop skills – are also highly recommended to engage young people in social entrepreneurship⁶¹.

Social entrepreneurship is a significant lever for the progress of a community, region, country, as well as a testing ground for the development of entrepreneurial, creative, managerial skills of students, as well as a platform for uniting like-minded people. The key benefit of supporting student entrepreneurship through social projects is the formation of a strong brand of the local community, direct benefits of target audiences in the location of the project, and activation of the volunteer movement.

The limitation of the practice of involving students in social entrepreneurship is the system-wide problems of this type of activity – underfunding, the difficulty of finding investors, a long payback period, as well as specific features such as the low status of socially oriented projects in the eyes of society, family, friends. These restrictions lead to a decrease in motivation to participate in socially oriented projects, and draw students' attention to strictly commercial projects.

Standing apart are global youth practice-oriented NGOs and project contests, the largest of which focuses on social entrepreneurship.

Case. Global Changemakers⁶²

Global Changemakers is an international youth organization and a global pioneer in supporting youth-led sustainable development.

The mission of the initiative is to support young people in achieving positive change and to form more transparent, fair and sustainable communities open to inclusiveness. Key tools of the organization are skills development, capacity building, mentoring system and grant mechanism.

Youth are key to success in achieving the Sustainable Development Goals, but donor funding is rarely directed to youth and youth projects. Even with funding available, there is often not enough support and resources to develop the skills and abilities of these young leaders. Global Changemakers is working to fill this gap – and the results are impressive. Today, the organization has trained thousands of young people in over 180 countries, both online and face-to-face, and has provided grants to over 396 youth-led projects that collectively have impacted more than 8.3 million people.

Case. Global Changemakers⁶²

Hult Prize is an international social entrepreneurship case championship, the winners of

^[61] <http://www.gsen.global/wp-content/uploads/GSEN-Report-Design-5-forweb-2.pdf>

^[62] <https://www.global-changemakers.net/about>

^[63] <https://www.hultprize.org/>

which receive 8 weeks of training from the best businessmen in the world and \$ 1,000,000 to grow their startup.

The UN is the general partner of the championship and the main customer of business strategies. This year, participants are challenged to develop a strategy to help tackle youth unemployment.

Hundreds of universities participate in the university stage, among which teams are selected for regional and then global selection. The winners of the regional final from Europe enter the summer program at a business accelerator in London, where they develop their ideas, and then compete for the title of champion at the UN headquarters.

The president of the organization is former US President Bill Clinton in collaboration with the Clinton Foundation. At this event, student teams from business schools from around the world propose potential solutions for the socio-economic development of the regions where the HULT PRIZE competition is being held. The annual competition touches upon various social issues, such as the accessibility of education, the fight against hunger and environmental pollution, and poverty.

International initiatives to support entrepreneurship are frequent, very general in nature and postulate the importance of using entrepreneurial thinking, initiative and technological development to solve major problems of human development, therefore, they focus on sustainable development and social entrepreneurship of youth. A limitation of this approach can be called a very strict selection due to the large scale of initiatives, as well as isolation from the local characteristics of both the student entrepreneurial community and the pressing environmental or social issues of the region where the student lives and works.

2.3. Innovation and Engineering Infrastructure of Universities: Incubating Student Entrepreneurship

The World Economic Forum suggests that universities should be more active in supporting student entrepreneurship⁶⁴. Infrastructure readiness is one of the important elements to effectively support this area.

There is a wide range of facilities and equipment universities offer to encourage student entrepreneurs, hackspaces, makerspaces, invention rooms, wet-labs and digital observatories⁶⁵. Most of them cope with the problem of lacking cooperation and teamwork as well as giving access to the equipment which not every team could afford due to its cost.

2.3.1 Spaces - hackspaces, makerspaces

Hackerspace, hackspace or makerspace is a real (as opposed to virtual) place where people with similar interests, most often scientific, technological, in digital or electronic art, communication and joint creativity, gather together. Typical activities in hackerspaces include: gaining and sharing knowledge, presentations and lectures, social activities, including games and recreational activities.

Hackerspace provides the infrastructure necessary for these actions: premises, electricity, servers and computer networks with Internet access, a variety of tools, audio equipment, video projectors, food and drinks, game consoles, and more. The most advanced ones provide access to expensive rapid prototyping equipment.

Membership dues are usually the main source of income for hackerspaces, although some are sponsored or organized by universities. The latter type is the most interesting, since they are focused specifically on student entrepreneurship.

Case. Advanced HackSpace Imperial College London, UK ⁶⁶

The mission of space is to bring ideas to life and help anyone to do anything! Space invites to open its doors to everyone who has a moment of inspiration or an idea that needs implementation. As the creators themselves say, Advanced Hackspace is “a community like no other. We bring together inventive minds from all fields, disciplines and knowledge levels to collaborate, experiment and innovate. All for the sake of doing amazing things.

Key activities of space:

- 1 Work with experts in the form of individual mentoring by Hack Fellows or participation in one seminar.
- 2 The only place on campus where you can access resources such as electronics, wood and metal workshops, biolaboratory, and a wide range of prototyping tools. Various competitions and initiatives for which participants can apply. The Advanced Hackspace features a virtual 3D tour modeled to showcase innovative campus spaces. Three specially designed spaces are responsible for prototyping and production and maker tasks.

^[64] <https://www.forbes.com/sites/adigaskell/2016/04/05/how-can-student-entrepreneurship-be-encouraged/?sh=4ae234fc30d>

^[65] <https://www.forbes.com/sites/adigaskell/2016/04/05/how-can-student-entrepreneurship-be-encouraged/?sh=4ae234fc30d>

^[66] <https://imperialhackspace.com/the-hackspace/>

Hackspace includes three thematic areas: 1) Electronics and Digital Manufacturing Workshop, 2) Biochemistry Lab, 3) Mechanical Workshop.

Case. HackSpace Southern Federal University, Russia⁶⁷

HackSpace of the Southern Federal University is an open space for independent work of students, combining a coworking center and a prototyping laboratory.

The HackSpace laboratory has the following equipment:

- 3D printer Makerbot Replicator Dual Extruder
- Artec Eva 3D scanner
- Mini PC Raspberry Pi model B
- Arduino Uno, Nano, Yún
- soldering stations and etc.

All this and a relaxed creative atmosphere allows students to quickly move from the idea of an electronic device to a real working prototype.

The student laboratory HackSpace was created in 2012 in the structure of the student design bureau "Technologies of information and telecommunications countermeasures to threats to the security of the individual, society, state" of the Institute of Computer Technologies and Information Security of the Southern Federal University with the financial support of the federal target program "Scientific and scientific Russia".

Case. uOttawa Richard L'Abbé Makerspace, Canada⁶⁸

UOttawa Richard L'Abbé Makerspace is a place where everyone can collaborate with interesting specialists and create projects of their dreams. Students and community members can invent, create, build and play. The work of the space is coordinated, organized and managed by students of different specialties, which gives them additional experience of entrepreneurship and establishment of activities in a particular field.

Makerspace is part of the community manufacturing ecosystem as an identity building element at the University of Ottawa. This allows students enrolled in design skills courses to use the equipment and space to test and prototype their designs. Collaboration fosters creativity and innovation, enabling students and community members to work effectively on projects to solve real-world problems. Types of services provided by the space to develop and support innovation in the developer community:

- **MakerRepo:** An open source repository of maker projects.
- **Makerstore:** The uOttawa Makerstore sells components supplies to students and members of the community to help them create and finish their projects.
- **Workshops and training:** The Makerspace offers free training on the use of the equipment provided. This training takes place in the Makerlab and is open to all. In addition, they offer customized workshops (for a fee) for organizations and educational institutions.

^[67] <http://ictis.sfedu.ru/hackspace/>

^[68] <https://engineering.uottawa.ca/ceed/design-spaces/makerspace>

2.3.2 Invention rooms, wet-labs and digital observatories, prototyping centers

Case. CoMotion Labs University of Washington⁶⁹

CoMotion Labs provide an incubation environment for early stage startups with a focus on University spinoff companies and multidisciplinary topics. Space drives company growth and market entry by 1) providing critical infrastructure (desks, dry tables, wet labs, and prototyping capabilities), 2) timely training, mentoring, and networking.

The labs currently serve 60 startups and operate in three locations across the Seattle campus - two in Fluke Hall and one in Startup Hall. Each lab is focused on a specific sector of the industry: life sciences and equipment in one part of the campus, and technology in another.

Member benefits include: spaces itself (desks & offices, conference Rooms, wet labs & dry Labs, prototyping support), networking (peer to peer, industry partners, research partners, investors), learning (startup sessions, workshops, bootcamps, special topics), services (business coaching, mentors, UW Cost Centers, preferred vendors).

Fluke Hall's CoMotion Labs Life Sciences Incubator provides a wet substance lab and collaboration space on campus for startups specializing in life sciences, biotechnology, and medical technology. The Equipment Incubator at Fluke Hall provides members with state-of-the-art infrastructure and equipment designed to help members achieve their goals in projects and startups. The workspace includes 20 workbenches, seated and standing desks, two conference rooms, four phone booths, a relaxation area, and plenty of lockers and storage racks.

Participants also have access to a complete set of tools and equipment needed for prototyping and development. CoMotion Labs' technology incubator at Startup Hall, located in the Condon Building, hosts information technology and software startups, and also includes the BECU fintech incubator and the Kernel Labs startup studio.

Case. Prototyping & Access to University Instrumentation in Northwestern University, USA⁷⁰

The prototyping and equipment access center at this university includes two types of spaces: 1) a prototyping and manufacturing laboratory, and 2) rooms and equipment with critical infrastructures.

Segal Prototyping and Fabrication Lab open only for internal use, focused primarily on students and staff of the University.

The Segal Prototyping and Fabrication Lab provides an opportunity through design to move from theory to practical product implementation in a safe and supportive learning environment. It is located in the basement and basement of the Ford Motor Company Engineering Design Center and is available for student use.

The Segal Prototyping and Manufacturing Laboratory is available to students and teachers as part of their educational projects. The laboratory is staffed with laboratory specialists and laboratory leadership students who have experience with the equipment and processes required to carry out design work.

^[69] <https://comotion.uw.edu/what-we-do/comotion-labs/home/>

^[70] <https://www.northwestern.edu/>

Northwestern Shared and Core Facilities open primarily to research staff as well as external researchers. Students have access to this set of services only if they work in a science-intensive project as a researcher. It can be a technology startup, but the format is not limited to this and includes just research projects without an entrepreneurial component.

The main objects are the research infrastructures of the University, providing resources for innovative development. In these shared labs, researchers receive the tools and technical support to make discoveries that will shape the future of the country and the world. Laboratories operate on a fee-for-service basis, most of which are also available to external researchers.

Case. Shared Use Center "Prototyping and Industrial Design" of ITMO University, Russia⁷¹

The main goal of the center is to support development and technological work.

Main directions of support: R&D; functioning of the LLP; execution of master's and master's theses. The center also fulfills orders for the creation of prototypes and individual parts.

Case. ENGINEERING CENTER FOR HIGH COMPLEXITY PROTOTYPING "KINETIKA" NUST "MISIS", Russia⁷²

Key information about the Center

The unique engineering center for prototyping of high complexity NUST MISIS is a universal modern high-tech platform for prototyping of high complexity, which allows you to generate, create, calculate and build complex multi-industry industrial projects in digital and analog formats based on orders from the leaders of domestic engineering.

The Center's functionality allows the creation of complex functional industrial prototypes in digital format with a level of development and preparation sufficient for the release of the product into production, as well as with design documentation for the product. The engineering center should become the leading Russian high-tech digital laboratory for industrial design and the creation of high-complexity prototypes for the domestic industry.

The production base of the Center allows you to implement any projects and produce any equipment that combines classic high-precision technologies and new processes for creating real objects. The functionality of the Center will allow you to generate, create, calculate and build complex functional prototypes in digital format. The dimensions of the created object vary from micron to 20 meters.

New types of spaces that support and facilitate the entrepreneurial process are opening up everywhere in universities. The most advanced experience is with organizations from the UK, where branched and tailored spaces have been created to solve various types of problems. As it can be seen from the examples, Russian universities have also joined this mainstream.

From the given cases it can be seen, infrastructure services for helping student teams are in demand in the world and are implemented in a variety of formats. The main function of such spaces is to reduce the costs of projects in the early stages, when they are most vulnerable to unnecessary financial burden. These new types of spaces are helping startups, incl. student, quickly go from idea to concrete implementation, quickly test different hypotheses and exchange experience with teams that work in related fields.

^[71] https://research.itmo.ru/ru/stat/192/CKP_Promdesignne.htm

^[72] <https://misis.ru/university/struktura-universiteta/centre/26/>

2.4. Student initiatives, organizations, communities, clubs in the development of student entrepreneurship

Universities provide education, research and environment for the students to educate and create social transformation through it. Formal activities of universities that are under control of them directed to entrepreneurial education and support of entrepreneurial activities and innovations are not sufficient for those students who are not satisfied with their personal growth and active participating in the processes beyond presenting in the classroom or listening lectures with the low extent of interaction, those who are seeking for fulfilment and desire to deep their knowledge of practice.



Student communities, organizations and initiatives, clubs are dynamic due to turnover of the student body, interactive, practice-oriented and not controlled by the university form of organizations with all basic features of a social organization (distribution of roles and responsibilities, the presence of a common goal, coordinated activities of participants to achieve it, shared norms, values and rules, formal and informal, etc.⁷³). Student organizations unite participants in mutual engagement and a value-sharing, the participants share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an on-going basis⁷⁴.

The context of the entrepreneurial university⁷⁵ influences the nature and type of emerging student organizations, in case of that the students interpret the university climate as positive and supportive for the development of entrepreneurship, expressed through the university strategy, innovation and entrepreneur infrastructure, compulsory and elective components of entrepreneur education, when the students respond to this by forming clubs and organizations with an interest in carrying out extracurricular activities complementing institutional actions.

^[73] See, for ex., Barnard C. Organization and Management: Selected Papers. Cambridge, Mass. :Harvard University Press, 1938, . Blau P. Exchange and Power in Social Life. N. Y.: Wiley, 1986, Etzioni A. A comparative analysis of complex organizations. N. Y., 1961.

^[74] Julio Cesar Borges, Luciana Oranges Cezarino, Tamiris Capellaro Ferreira, Otavia Travençolo Muniz Sala, Delton Lehr Unglaub, Adriana Cristina Ferreira Caldana // Student organizations and Communities of Practice: Actions for the 2030 Agenda for Sustainable Development // The International Journal of Management Education 15 (2017) 172e182 <http://dx.doi.org/10.1016/j.ijme.2017.02.011> // 1472-8117/© 2017 Elsevier Ltd. All rights reserved.

^[75] Henry Etzkowitz Entrepreneurial scientists and entrepreneurial universities in American academic science Minerva volume 21, pages198-233(1983)/// <https://link.springer.com/article/10.1007%2FBF01097964>

Participating in student organizations provides development of professional skills and professional qualifications as well as teamwork and practical learning experiences preparing for future career. It gives students means and possibilities to study, based on practice and project learning, competencies for a highly demanding and competitive market. Besides, due to a wide range of collective and group activities run by student organizations students possess excellent networking opportunities. Studies show that "student organizations have the ability to engage students enthusiastically, provide opportunities for practical learning, generate a new learning environment, help students overcome curricular barriers, encourage student independence and engage students in productive extracurricular activities"⁷⁶. The abundance of a social learning environment and collaborative learning environment, which are generated in the student organizations, terminates in many planned as well as unplanned opportunities for learning.

Thus, it can be said that the main motives for students to engage into the student organizations is to obtain knowledge and expertise that complement formal education. To reflect this process towards the effects of the student organizations to create implicit learning dimensions it can be applied the notion "hidden curriculum" which refers educationally significant and nonacademic consequences that systematically occur and are not defined as explicit at any level of the public rationales for education⁷⁷. As it was mentioned before, student organizations gather people together who interact with each other and network. Built networks foster the creation of new knowledge and new learning because of the shared practical activities fulfilled by the participants. The changes in the spaces, times and relations in which learning takes place favor a network of learning spaces where nonformal and informal spaces of learning will interact with and complement formal educational institutions⁷⁸. Student organizations function as learning networks and the implicit learning dimensions.

The above said confirmed by the study carried out by J.C.Borges and others⁷⁹ with usage of qualitative methods. According to the study results the students noted that joined to the student organization for "learning", "developing personal and professional skills", and "to get experience", "preparation for future employment", "practice", participation in "projects", obtaining outstanding experience of "leadership", "work" in teams, relationship and living together as a distinct experience.

^[76] Julio Cesar Borges, Luciana Oranges Cezarino, Tamiris Capellaro Ferreira, Otavia Travençolo Muniz Sala, Delton Lehr Unglaub, Adriana Cristina Ferreira Caldana // Student organizations and Communities of Practice: Actions for the 2030 Agenda for Sustainable Development // The International Journal of Management Education 15 (2017) 172e182 <http://dx.doi.org/10.1016/j.ijme.2017.02.011> // 1472-8117/© 2017 Elsevier Ltd. All rights reserved.

^[77] Julio Cesar Borges, Tamiris Capellaro Ferreira, Marcelo Silveira Borges de Oliveira, Nayeley Macini, Adriana Cristina Ferreira Caldana // The International Journal of Management Education 15 (2017) 153e161 <http://dx.doi.org/10.1016/j.ijme.2017.03.003> 1472-8117

^[78] UNESCO. (2015). Rethinking Education: Towards a global common good? Paris. Retrieved from <http://unesdoc.unesco.org/images/0023/002325/232555e.pdf>.

^[79] Julio Cesar Borges, Tamiris Capellaro Ferreira, Marcelo Silveira Borges de Oliveira, Nayeley Macini, Adriana Cristina Ferreira Caldana // The International Journal of Management Education 15 (2017) 153e161 <http://dx.doi.org/10.1016/j.ijme.2017.03.003> 1472-8117

Case. MIT Student Entrepreneur Clubs

Massachusetts Institute of Technology (MIT). One of the most prestigious technical educational institutions in the United States and the world. MIT holds leading positions in highly regarded rankings of universities in the world, is an innovator in the fields of robotics and artificial intelligence, and its educational engineering programs, programs in information technology, economics, physics, chemistry and mathematics are known in many other fields, including management, economics, linguistics, political science, philosophy and music.

MIT is the world's largest research organization. The university has nearly 12,000 students from 115 countries. The university annually spends about \$ 1 billion on research - according to this indicator, it ranks 14th in the United States. MIT is one of the first universities to collaborate with other universities, business and government in the field of research. For example, the university actively collaborates with Harvard in the field of medicine and technology (largely due to the geographical proximity of campuses). MIT students can take courses at Harvard University and vice versa.

There are around MIT student-led 450 clubs - a student-led organizations with different focuses and types of activities. At MIT Sloan School of Management there are industry-focused clubs (for instance, Education Club, Entrepreneurship Club, Family Business Club, Finance and Policy Club, FinTech Club, Global Macro Investing Club, Infrastructure and Project Finance Club, Investment Banking Club and others).

- MIT Ventureships⁸⁰ Club is a MIT regular funded club to propel the start-up ecosystem evolution at MIT.

MIT Ventureships Club aims to enhance the startup working experiences of MIT students. Its goal is to help hatch more brilliant MIT ideas into startups and to propel the startup ecosystem evolution at the Institute. The eight startups selected for the Ventureships program included MIT 100K finalists and winners, and over 400 students were engaged.

The main activities are focused on sharing start-up opportunities with MIT students and connect them with founders. To achieve this the club offers opportunities to MIT students for immersion into real world start-up experiences through differently featured programs; the Ventureships Club holds semester-long programs and partners with the MIT Venture Mentoring Service (VMS).

Guided by the Venture Mentoring Service, the Club runs its program every semester, providing great value to both MIT startups and students. Over 2020, the programs attracted students from various backgrounds: roughly 30% are from business, finance and management, and 70% are from engineering. About 20% of applicants are undergrads, 5% are post-docs, and the rest are graduate students.

The Ventureships Club also expanded its partnership with Microsoft and became a BizSpark Network Partner. Additional partnerships included Angels Global and

^[76] <https://innovation.mit.edu/resource/ventureships-club/>

Xtecher to provide startups with fundraising and PR services. Additionally, the group built strategic collaborations with various student organizations on campus, including the Sloan E&I Club. Ventureships Club was also a speaker and discussant at the MIT Startup Ecosystem Conference in 2020. With over 940 subscribers on its mailing list, Ventureships Club is working hard to connect and bring the greatest value to founders and students alike.

VentureShips offers hands-on training for the next generation of entrepreneurs and business leaders. Students work with MIT-affiliated early-stage startup companies on real-life business issues⁸¹.

■ StartLabs is MIT's undergraduate entrepreneurship club⁸².

Their mission is to catalyze engineering students to bring technical innovations to society through entrepreneurship. They do this by helping students start their own companies and by connecting students with the Boston startup ecosystem by introducing them to founders and providing access to internships and careers.

■ MIT Sloan Entrepreneurship Club⁸³.

The MIT Sloan Entrepreneurship Club aims to reignite the spirit of entrepreneurship across the Sloan community and to offer an intimate support system for entrepreneurs and those interested in startups at Sloan. Supports over 350 members with an extensive program including sharing and connecting students with externship, internship and fellowship opportunities, organized treks to entrepreneurial ecosystems. The MIT Sloan Entrepreneurship Club supports over 350 members with an extensive program, including sharing and connecting students with externship, internship, and fellowship opportunities, organized treks to entrepreneurial ecosystems like Silicon Valley, New York, and Boulder, a speaker series of inspiring entrepreneur idols, and mixers, workshops, and social events to allow MIT entrepreneurs to share their ideas.

MIT case witnesses the diverse group of student clubs each of which although are in the domain of entrepreneurship has found a certain niche to work out. This makes available to combine the pieces of knowledge and thoroughly learn specific area of entrepreneurship from industry peculiarities to common topics as financing and cross-cutting digital technologies.

Case. The Young Entrepreneurs Society, YES!Delft, Delft University of Technology⁸⁴

The case of TU Delft distinguishes by its well-grounded and bind ecosystem of students' clubs and societies with TU Delft infrastructure and capacities for innovation and entrepreneurship education and supportive measures, as well as Delft city support. TU Delft has always been an entrepreneurial university. The business incubator of the Technical University Delft and one of the first incubators in the Netherlands YES!Delft was opened in 2005. This tied collaboration results in generating technological business in the region and its growth.

^[81] <https://innovation.mit.edu/resource/ventureships-club/>

^[82] <https://innovation.mit.edu/resource/startlabs/>

^[83] <https://innovation.mit.edu/resource/mit-sloan-ei-club/>, <https://mitsloan.mit.edu/student-life/student-clubs-mit-sloan#follow-along>

^[84] www.yesdelft.nl

It was officially launched in April of 2005. 15 years ago Delft city council taking into account that fact that there were a large number of research institutes and technological companies (TNO, TU Delft, Rijkswaterstaat, etc) in the city's boundaries, installed a policy that was based on helping the city's economy shift from the traditional craft-based economy to a technology-based economy, and appropriately named it 'Delft Kennisstad', or 'Delft Knowledge City' that started acting as an umbrella for the city's policies (supporting and stimulating local business networks and subsidized more cultural activities, increasing collaboration with institutes like TU Delft and TNO).

To increase benefits for the society TU Delft⁸⁵ has close ties with the big players in the field of technological research and design. The TU therefore decided to feature entrepreneurship as one of its main focuses.

Sharing a common interest in capitalizing on the available technological knowledge TU Delft and Delft city council work closely together. The Young Entrepreneurs Society "YES!Delft" is the most ambitious result of their combined efforts. Located on the Rotterdamseweg, in the university campus "YES!Delft" offers people who want to start their own technology based businesses) the environment to learn how to best start up their own companies. TU students, alumni and staff, as well as others who are committed to starting their own high tech companies are coached on just about everything they need to know to ensure their new business ventures succeed⁸⁶.

With funding provided by the city councils of Delft and Rotterdam, YES!Delft runs the "Awareness" project called, which aims to create more awareness about the possibilities of entrepreneurship among students, even those who don't have intentions to start own business⁸⁷.

YES!Delft Business Club, TU Delft

There is also a YES!Delft Business Club, which is basically a network for established companies and start-up companies to meet and share ideas. And student entrepreneurs can participate in courses like 'Writing a business plan', in collaboration with NJO, the Young Entrepreneurs Network, that was also initiated by TU Delft. The society is also open to international students and staff members. The only restriction is that the prospective companies have to be founded in the Netherlands. At the same time one of the desired direction is to help start-ups go global with finding potential investors and interested parties beyond Netherlands. The society has resulted starting up many businesses, a few of them were initiated TU Delft researchers. The basic activities to facilitate start-ups and businesses, offer coaching and provide a network.

YES!DELFT STUDENTS, TU Delft⁸⁸

"YES!Delft Student" aims to inspire, motivate and educate students to become

^[85] Delft University of Technology (Dutch: Technische Universiteit Delft) also known as TU Delft, is the oldest and largest Dutch public technological university. Located in Delft Netherlands, it is consistently ranked as one of the best universities in the Netherlands and as of 2020, it is ranked by QS World University Rankings among the top 15 engineering and technology universities in the world// https://en.wikipedia.org/wiki/Delft_University_of_Technology

^[86] <https://www.delta.tudelft.nl/article/yesdelft-encouraging-entrepreneurship-delft>

^[87] <https://www.delta.tudelft.nl/article/yesdelft-encouraging-entrepreneurship-delft>

^[88] <https://yesdelftstudents.nl/about-us/>

entrepreneurs. With more than 70 events throughout the year, Student Startup Programme and TU Delft courses bridge the gap between ideas and businesses.

YES!Delft Students is a student-led organization⁸⁹ and a strong community that is self-sustaining and aids each individual in the development of a student to an entrepreneur. It was born from YES!Delft (the business incubator of the Technical University Delft in The Netherlands) in 2009. There are currently 10 student entrepreneurial associations in the Netherlands, each connected to an incubator. YES!Delft Students acts as a non-profit organization working full-time instead of part-time and offering in addition to events, also educational courses, and student startup programs to actually help students become entrepreneurs. Over 8000 students are reached per a year with YES!Delft Students events. Converting over 200 students to become entrepreneurs and help with the founding of over 80 student startups in the last 5 years.

Delft sees the importance entrepreneurship to bring society benefits via transferring new technology into valuable products and services. Delft University of Technology stimulates entrepreneurship in a number of ways: by investing in start-ups, by offering education programmes focused on entrepreneurship and by coaching starting companies, among others with the Young Entrepreneurs Society Delft (YES!Delft), the incubator YES!Delft and Yes!DelftStudent.

Case. Innovation & Entrepreneurship Club, Imperial College Business School

Imperial College London is a world top ten university with an international reputation for excellence in teaching and research⁹⁰ Public research university Imperial College is a multidisciplinary space for education, research, translation and commercialisation, harnessing science and innovation to tackle global challenges.

Imperial College Business School is a key player in business education, offering a full range of courses and degrees, and conducting research that benefits from being in the world's leading financial and business capital. It consistently ranks among the top business schools in Europe and worldwide⁹¹.

The Imperial College Business School Innovation & Entrepreneurship Club is a student-led club for anyone with an interest in cultivating their innovative & entrepreneurial spirit. Through community-driven initiatives the club fosters networking events, peer to peer development, learning opportunities and provide an informal platform to discuss students' innovative ideas.

The aim of the Innovation & Entrepreneurship Club is to provide the members with access, resources, and mentorship to cultivate their interests in innovation to transform them into the future entrepreneurs. The club is run by the committee of 7 members, who are MBA students.

There are 300 club members, including alumni. The club cooperates with Imperial's other faculties and departments too. On average we have between

^[89]<https://yesdelftstudents.nl/board/>

^[90]<https://www.imperial.ac.uk/about/introducing-imperial/>

^[91]<https://www.imperial.ac.uk/business-school/about-us/rankings-facts-figures/>

50-75 people coming to the events⁹². The main domains of the interest are: network with startups, founders, members, alumni, building entrepreneurial awareness, insights of best practices from the startup world and established firms, socializing with like-minded members of the club, pitching training, events with speakers-entrepreneur to learn about idea generation to financing⁹³.

Innovation & Entrepreneurship Club has a startup module as part of the MBA called "Entrepreneurship, innovation and design", a course runs in collaboration with the Royal College of Art and to the Imperial College's engineering faculty and external companies, it lasts for 6 months. The MBA students are tasked to bring a company to fruition, with help from coaching sessions and mentors. After 6 months they submit and present the business plans to a group of judges who select which groups go forward. The Club and the academic staff are responsible for organizing the panel of competition judges (two angel investors, a venture capitalist, an entrepreneur). The final groups will do an elevator pitch and a winner is chosen and takes a financial prize which allows the company to start-up for real⁹⁴.

The Imperial College Business School Innovation & Entrepreneurship Club manages to adapt its activities adjusting to the market, connects the community of experts, mentors, corporate partners, and teachers with the students, supporting them to become entrepreneurs.

Case. ITMO University Entrepreneur Student Clubs

ITMO University⁹⁵ is one of Russia's leading higher education and research institutions in the fields of Information Technologies, Photonics, and Optics.

ITMO's focus is on training professionals who are capable of tackling some of the world's top societal challenges via ICT, Robotics, Science Communication, Translational Medicine, Urban Studies, Photonics, Optics, and Art&Science. ITMO University is among the top performers of the 5-to-100 Russian Academic Excellence Project (<http://5top100.com/about/more-about/>). The prestigious government-funded program is aimed at raising the competitiveness of the Russian higher education institutions among the world's leading research and education centers during 2013 - 2020. ITMO University has one of the leading startups and innovation infrastructures in Russia, creating startups and innovation companies is one of the main focuses. The University's mission is to prepare its graduates for the challenges of the 21st century. Its 13 international research centers⁹⁶ generate advanced knowledge and bring top innovative ideas to the market through an established system of R&D support. Recently, into the ITMO innovative & entrepreneurship ecosystem there were integrated industry-driven and entrepreneurial student clubs that complemented the formal activities and education in entrepreneurship.

^[92] <https://www.businessbecause.com/news/mba-degree/1531/imperial-college-business-school-entrepreneurship-club>

^[93] <https://www.imperial.ac.uk/business-school/programmes/careers/business-school-career-clubs/innov-entrepreneurship-club/>

^[94] <https://www.businessbecause.com/news/mba-degree/1531/imperial-college-business-school-entrepreneurship-club>

^[95] <https://en.itmo.ru>

^[96] https://en.itmo.ru/en/page/303/Research_Units.htm

Energy Club, ITMO University

Energy Club was launched in 2020 as an industry-driven and a student-led club with the strategic goal to create mechanisms and platforms for communication and interaction with the energy sector (corporations, companies, research bureaus, etc.) with the higher education sector. To achieve it the club strives to form an agenda of current trends, finding industrial partner and support joint project implemented in partnership with ITMO young researchers, event with speakers from industry, collective events focused on developing innovative and entrepreneurial skills of ITMO students (case championships, hackathons, Summer Schools, etc.), networking, matchmaking students and companies for internships, R&D. The club invites to join bachelors, masters, postgraduate students and young scientists. Based on their demands and need the Club provide the activities. The events of the club help the members and participants to get knowledge and practice of interacting with business sector, obtain professional experience, networking and learning future profession, matching projects and implementers (team members).

Startup Thesis Club, ITMO University⁹⁷

ITMO has a Startup as a Diploma program, whereby students can create their own startup, test technology, attract investments, and enter the market instead of carrying out the classical Final qualifying work. Startup Thesis Club is a student community of entrepreneurs who go through the startup program as a diploma with their projects. The club organizes meetings with representatives of ITMO university, one of the popular formats is business breakfasts with invited speakers (experts, startups who are ready to share their own experience, give feedback on projects and pitches, share their own vision of technological trends in various fields). In other As the leaders of the club define, the main value of Startup Thesis Club is networking - to know each other, communicate, give recommendations on projects, find the necessary contacts and access to experts. Startup Thesis Club forms a community of future entrepreneurs and create an environment of highly motivated and initiative students with their own promising projects.

Interuniversity Entrepreneurship Club, ITMO University

Interuniversity Entrepreneurship Club was born from the Entrepreneurship Center of ITMO University and is a student-led organization run in partnership with ITMO Accelerator. The club is open to students from St. Petersburg Universities and offers networking, entrepreneurial skills' advancing through lectures, workshops, and master classes with speakers-entrepreneurs. The club is a community of like-minded students interested in developing entrepreneurial skills and creating their own business. The club provides an opportunity to network, find investors and industrial partners, mentorship support, obtain skills in leadership, communication, presenting, analytics, marketing, teamwork, learn how to start up from idea to MVP through lectures with prominent entrepreneurs, Summer/Winter Schools. The club strongly collaborates with ITMO accelerator, the most active participants go through accelerating.

^[97]<https://vk.com/startupthesis>

GreenTech Club, ITMO University

It is a student-led organization aimed at development of technologies to reduce the negative impact on the environment, facilitate the forming of eco-friendly and sustainable mindset of the students. The club was organized by the students of GreenTech Faculty but it cooperates with other faculties as the students strives to establish and run interdisciplinary projects.

Hult Prize ITMO Community, ITMO University

The mission of student-led Hult Prize ITMO Community is the creation and development of a vivid community fostering social entrepreneurship among students through the activities of the Hult Prize movement. The Community to assist students in starting social business projects, to promote the Sustainable Development Goals and Hult Prize movement through holding events focused on social entrepreneurship, workshops, finding funds, mentor's support. The Club gives the opportunity to become part of an international community of 2,100,000 social entrepreneurship leaders, to gain experience in international communication and event organization, international career opportunities at the Hult Prize and the UN. Hult Prize ITMO Community runs the Hult Prize OnCampus 6-months program at ITMO University, which ends with a pitch session where 16 teams of 3-4 ITMO students present their sustainable projects. The outcomes of this program are useful guide how to start and develop social projects and an extensive networking with experts and mentors. The club actively collaborates with Xlab, ITMO Accelerator, Department for the development of project activities, Interuniversity Entrepreneurship Club, TWIN CAMPUS project⁹⁸. The club's members take part in the Rosmolodezh forums The Territory of Senses. Hult Prize ITMO Community runs an educational program for student teams planning to participate in the Hult Prize Impact Summit championship⁹⁹ and will hold the university stage of the championship in 2021.

Currently more than 50 different clubs have been created at ITMO - these are communities that are engaged in creativity, volunteer and environmental projects, sports, competence development, as well as several international clubs in which foreign students actively participate. The clubs organize over 300 events a year. The University provides administrative and informational support to proactive organizers: clubs are provided with premises, support for document management and design of printed products, photos and videos, as well as support in filing applications for various grants. All student clubs provide students opportunity to enrich knowledge and skills useful for their future professional path. The industry-focused and entrepreneurial clubs complement formal and compulsory educational programs and courses, giving practice and bringing real-life tasks and cases from business, contributing into developing professional and soft skills, networking, bridge the university environment and entrepreneur communities.

^[98]Twin Campus project is financed from the funds of the European Union, the Russian Federation and the Republic of Finland in the framework of the Russia-South-East Finland CBC 2014-2020//<http://www.twincampus.info/>

^[99]The Hult Prize is an annual, year-long competition that crowd-sources ideas from university level students after challenging them to solve a pressing social issue around topics such as food security, water access, energy, and education // https://en.wikipedia.org/wiki/Hult_Prize , <https://www.hultprize.org/impact-summits/>

Case. LUT Entrepreneurship Society, LUT University

LUT University (Lappeenranta-Lahti University of Technology LUT) a state run, and funded University in Finland located in the South-Eastern part of the country. LUT is an international science university that conducts strong academic research and provides higher education based on that research. Since 2014 LUT University has been ranked among the world's top 600 universities (Times Higher Education and QS rankings). LUT University has in Chemical Engineering, in Energy Technology, in Environmental Technology, in Mechanical Engineering, in Electrical Engineering and in Industrial Management¹⁰⁰.

LUT Entrepreneurship Society "LUTES" brings together students and entrepreneurs. It is a student-led organization that operates on the Lappeenranta campus, creating an open and inspiring environment for entrepreneurship and self-development. LUTES regularly organizes various events and programs where participants get to hear inspiring speakers, compete in pitching competitions, and solve challenges in hackathons that is aimed at shaping entrepreneurial mindset and skills. With an early-stage growth entrepreneurship program organized by LUTES student teams develop an idea into a startup during 7 weeks with the help of mentors and workshops. The program focuses on the acquisition of first customers, product development and business model development. The program culminates in the opportunity to pitch the company to investors and the public. LUTES is a low-threshold help and concrete support for those planning entrepreneurship or dreaming of a future startup, but also a unique opportunity to network with entrepreneurial students and entrepreneurs both locally and through the entire Finnish ES-community¹⁰¹. The activities are open to students from all over the campus and entrepreneurs in South-Karelia area. The goal is to increase the entrepreneurial attitude and way of thinking among LUT and LAB students¹⁰² while developing the Lappeenranta entrepreneurship ecosystem and the entire Finnish network of startup companies. LAB is a higher education institution that specializes in innovation, business and industries. It provides education driven by the needs of the working world and carries out applied research, development and innovation activities and artistic activities. LUT's research focuses on energy, air, water and responsible business. LAB's education, research, development and innovation specialize in the circular economy, design, the commercialization of innovations, and health care service innovations. LUT and LAB also collaborate in education and projects in these focus areas. Combining expertise and achievements of two neighboring Universities LUT and LAB generate to multiply impact on the regional growth through innovations and entrepreneurship¹⁰³.

Case. LUT Entrepreneurship Society, LUT University

South-Eastern Finland University of Applied Sciences (Xamk) is the 5th largest university of applied sciences in Finland with 9400 students and 750 faculty

^[100]https://en.wikipedia.org/wiki/LUT_University

^[101]ES - Entrepreneur Society

^[102]LAB University of Applied Sciences (LAB) is a multidisciplinary institution of higher professional education in southern Finland// <https://www.lab.fi/en/info/about-us/lut-group>

^[103]<https://lutes.fi>
<https://www.lut.fi/web/en/cooperation-and-services/growth-for-companies/entrepreneurship-society-lutes>

members across four campuses. Xamk is jointly owned by the cities of Mikkeli, Kotka, Savonlinna and Kouvola with Mikkeli holding a majority stake (52%) since August 2019. Xamk is actively pursuing research, development and innovation activities and is currently the leader among Finnish universities of applied sciences in research, development and innovation, based on external funding alone. Xamk participates in over 170 projects annually, in which our experts discover, test and develop new products and services, or carry out research in accordance with future needs. Xamk is the largest University of Applied Sciences in Finland in terms of R&D activities carried out. The research carried out is mostly applied research in close co-operation with companies and most development efforts concentrate on regional development.

Research and development activities at Xamk are divided into four focus areas: Digital economy, Forest, the environment and energy, Logistics, marine technology and transport, Sustainable well-being¹⁰⁴.

PatteriES, Patteri Entrepreneurship Society¹⁰⁵ is a student-led entrepreneurship society in Xamk. Patteri connects students to regional working life, arranges various events and networking opportunities. Patteri works closely with entrepreneurial projects in Xamk as well as regional organizations. PatteriES was founded in early 2013 to boost Free-of-Charge Entrepreneurial activities in Kymenlaakso Region.

It helps to boost students' professional growth and the welfare at the region of both the blooming Research & Development and Game Industry characteristics. The community promotes an entrepreneurial culture among students and supports entrepreneurial projects. Patteri is a source of business savvy knowledge and events for members and participants. It matches and links through The Patteri Path talented Patteri members, teachers, high-profiled mentors, and job opportunities into one approachable path. Engaging students to its activities supplies them to be able to obtain an Entrepreneurial Mindset and be prepared to the changing world. PatteriES organizes several specialized events, the largest of which is * ship Startup Festival. * ship is our biggest event. It connects the next generation of entrepreneurs with mentors and annually 50 startups compete for 5000 € main prize. PatteriES together with Otsakorpi Foundation, Xamk manage Xamk Startup Fund. Purpose of the fund is to support student entrepreneurship, student-run startups and students' projects. Grants are given to students and student teams in range of 500-1000 euros, which are intended for testing and development of the idea. Grants are given based on written applications. Criterias for funding are: applicant is a student in Xamk or the team has other ties to Xamk, the idea is new, interesting and viable, team is committed to development the idea, clarity of application and description how the grant would be used¹⁰⁶.

PatteriES demonstrates the scale of capability of the student-organized and led community to enable its members and participants to launch and run business, providing information, access to funds and infrastructure.

^[104] <https://www.xamk.fi/en>

^[105] www.patteries.com

^[106] <https://www.xamk.fi/en/startup/#opiskelijayritt%C3%A4jyys>

Despite efforts of universities proposing students a range of disciplines, physical and technological infrastructure, state-of-art teaching methodologies, the formal curricula of university programs are insufficient for the full formation and education of ambitious and dynamic students¹⁰⁷. The demand of complementing educational courses in management, accounting and economics within entrepreneurship education with informal and implicit flows of knowledge and practice leads students to participate in student organizations. The general motive of students is learning together with getting the practical application of knowledge, practical experience, the intention to develop personal and professional skills, to be prepared for professional future. Simultaneously a great opportunity to network and find personal, professional and social contacts attract students. Additional benefits for during participating a student organization are learning successful stories and lessons learnt from outstanding entrepreneurs first-hand, personal relationships and acquaintanceships, being a team player of special projects, teamwork and leadership development. interaction among students through the network builds the environment of collective learning. Creating their own transdisciplinary educational content students add the hidden curriculum to the formal curriculum¹⁰⁸. Student initiative and organizations offer training such relevant skills as public speaking, creativity, negotiation, planning, time management, communication, digital marketing, practice marketing, market research, motivation. These have practical value for starting an entrepreneur career. Moreover, student organizations give students chances to attract first financing for development their project. This happens either through competitions with cash prizes, grants from university funds, or through meetings with investors. The non-formal and informal support within the student organization from the like-minded companions mitigates the fear to start technological business. Student clubs and communities operate as a connecting chain with the real economy sector, thereby preparing students for professional life. As well as they promote the establishment of partnerships with the industry, the consequence is attracting R&D to the university. Integration student organizations into the innovation and entrepreneurial ecosystem of the university leads to mutual benefit to both sites. Collaboration student organizations during events and activities with other departments of the university fosters the emergence of a technology business based on interdisciplinary research and development.

Even if a participating in the entrepreneur-focused student organizations student doesn't have intentions to become an entrepreneur right after graduating the university, the obtained within these extra curricula activities knowledge and skills will be useful either in the profession or later in the entrepreneur career. It is more likely that this student is ready for the changing labor market.

[107] Julio Cesar Borges, Tamiris Capellaro Ferreira, Marcelo Silveira Borges de Oliveira, Nayelee Macini, Adriana Cristina Ferreira
Hidden curriculum in student organizations: Learning, practice, socialization and responsible management in a business school
Caldana // The International Journal of Management Education 15 (2017) 153e161
//<http://dx.doi.org/10.1016/j.ijme.2017.03.003> 1472-8117

[108] Julio Cesar Borges, Tamiris Capellaro Ferreira, Marcelo Silveira Borges de Oliveira, Nayelee Macini, Adriana Cristina Ferreira
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//<http://dx.doi.org/10.1016/j.ijme.2017.03.003> 1472-8117

2.5. Educational programs, initiatives and additional vocational education in the system of university education in the context of the development of student entrepreneurship

For a long time, entrepreneurship has been perceived by society, especially in Russia, as an area of activity for selected people who have a certain talent and mindset. The closest to entrepreneurial educational programs were economics, finance, and MBA. The phenomenon of entrepreneurial undergraduate and graduate programs appeared later, and now we are seeing their heyday and transformation.

For example, even early research on entrepreneurship focused on the personality traits of entrepreneurs. The researchers tried to identify a specific set of characteristics that distinguished entrepreneurs from non-entrepreneurs^{109,110,111}. In a pooled study of entrepreneurial characteristics, the authors analyzed the literature and concluded that there are four basic personality traits of entrepreneurs: the need for achievement, an internal locus of control, a propensity for high risk, and a tolerance for ambiguity¹¹². In this regard, it can be concluded that in the 1960s - 1980s, the prevailing opinion is that entrepreneurship is not a set of skills and knowledge, but rather a set of personal traits.

Experts at Babson College USA¹¹³ refer to the words of the authoritative management guru Peter Drucker, who said: "Entrepreneurship is not magic, it is not mysterious and has nothing to do with genes. This is a discipline. And like any other discipline, you can learn it." These words confirm the high relevance of entrepreneurial education and determine the widespread use of the entrepreneurial university model in recent years.

Another confirmation of the relevance of entrepreneurship as a popular educational area is the size of investments that are directed to this area of study. For example, Goldman Sachs, one of the largest investment banking enterprises in the world by revenue and financial services company¹¹⁴, has funded and supported a 10,000 small business growth program through entrepreneurship training provided to business owners through community colleges in the United States and the UK, as well as 10,000 women entrepreneurs.

Moreover, large foundations such as Kauffman and Coleman support entrepreneurship learning initiatives targeting the local and even national economies. Interest in the development of entrepreneurial skills is growing rapidly, and therefore new approaches are emerging to keep up with demand, as well as to keep up with the changing nature of entrepreneurship learning.

^[109] McClelland, D. 1965. Need achievement and entrepreneurship: A longitudinal study. *Journal of Personality and Social Psychology*, 1, 389-92.

^[110] Collins, O.F., and Moore, D.G. 1970. *The organization makers*. New York: Appleton-Century-Crofts.

^[111] Cooper, A.C., and Dunkelberg, W.C. 1981. A new look at business entry: Experiences of 1805 entrepreneurs. In K.H. Vesper (ed.), *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College.

^[112] Brockhaus, R., and Horwitz, P. 1986. The psychology of the entrepreneur. In D. Sexton and R. Smilor (eds.), *The Art and Science of Entrepreneurship* (pp. 25-48). Cambridge, MA: Ballinger.

^[113] <https://www.babson.edu/academics/executive-education/babson-insight/entrepreneurship/entrepreneurship-history/#>

^[114] <https://www.goldmansachs.com/>

Agency for strategic initiatives in Russia¹¹⁵ interviewed the young ones and found out that more than 50% are afraid to start a business because they lack knowledge and skills of doing business. Rector of the Moscow Polytechnic University¹¹⁶, Vladimir Miklushevsky, believes that despite the fact that it is impossible to make entrepreneurs out of all students, everyone should have basic knowledge in the field of creating and running a business. Therefore, the compulsory subject "Fundamentals of Technological Entrepreneurship" is taught at the Moscow Poly from the first year¹¹⁷.

Below will be demonstrated the bright cases of entrepreneurial education at European leading universities.



The award-winning Norwegian School of Entrepreneurship (Gründerskolen) is a Norwegian academic cooperation program involving all universities and several university colleges in Norway: University of Oslo, Norwegian University of Science and Technology, University of Stavanger, Agder University, University of Bergen, University of Tromsø, Norwegian University of Life Sciences, Norwegian school of Management - BI, NHH - Norwegian School of Economics. The University of Oslo has overall academic and administrative responsibility for the program.

The Norwegian School of Entrepreneurship was founded in 1999 by Professor Nils D. Christophersen at the Department of Informatics at the University of Oslo. The program was launched in collaboration with Cornell University and 6 first-year students took part in the program in San Francisco. Since then, the program has developed rapidly, with approximately 150 students enrolled in recent years. The alumni network has over 2000 alumni and is by far the largest network of its kind in Norway.

^[115]A Russian autonomous non-profit organization founded by the Government of Russia. The agency aims to create opportunities for advancing Russia to global position implement through a set of measures in the economic and social spheres, among those to support the personal fulfilment of ambitious leaders of Russia// <https://asi.ru/eng/>

^[116]Moscow Polytechnic University (Russia) is a well-established institution with a campus incorporating 21 buildings and its own power plant since 1902. It declares a mission to train future professionals in technology, technological entrepreneurship, digital economy and professions of the future based on polydisciplinarity, project activities, international cooperation// <https://new.mospolytech.ru/en/about-university/university-today/>

^[117]<https://plus.rbc.ru/news/5fbcc52f7a8aa93b6bf411e6>

^[118]<https://grunderskolen.no/english/>

In 2007, the program received its first award for "Best Quality in Higher Education" from the Norwegian Ministry of Education and Research, and in 2006 for "Best Learning Environment" at the University of Oslo. In 2012, the program won the Norwegian Startup Awards 'Best Provider in the Startup Industry'.

The Norwegian School of Entrepreneurship program is divided into four parts and offers students the opportunity to gain direct entrepreneurial experience while working as interns at a new high-tech company abroad.

- 1** Introductory course. The introductory course provides students with a theoretical understanding of the elements of a business plan.
- 2** Startups in Practice - Entrepreneurship. Students spend 10 weeks working for start-up companies four days a week. This course provides students with a first-hand experience of entrepreneurship. They take part in the daily life of the start-up company, learn and contribute to their activities. Most companies need to have a technology focus. The internship is unpaid and provides students with an understanding of entrepreneurship in practice. In addition, there are 2-4 sessions over a 10 week working period with discussion and mentoring on important or difficult emerging issues, as well as 1-2 one-to-one meetings with a mentor.
- 3** The theory of entrepreneurship in an international context. In addition to internships, students attend classes at one of the partner universities. Classes usually take place one day a week. During this period, students have several assignments. This course focuses on the theory of creating and developing a successful high-potential venture, and examines the various key challenges faced by such a start-up venture.
- 4** Entrepreneurship and internationalization. In the spring, students attend a seminar and work on a reflection report during their internship. The workshop includes inspiration and support sessions to get the most out of the rest of the program, both academically and personally. Sessions usually include intercultural understanding and communication, entrepreneurs share their stories and destination briefings led by alumni.

The Foreign partners of The Norwegian School of Entrepreneurship which participate in the program:

- Boston University
- Rice University
- University of California Berkeley
- University of Toronto
- National University of Singapore

At the partner universities, students spend 10 weeks abroad and, in addition to their internships, attend lectures on entrepreneurship at the chosen university.

The requirement for participating in the Gründerskolen program is a bachelor's degree. Despite the fact that the program is focused on high-tech startups working in the IT, biotech or other technology sectors, students who do not have a technological background are also accepted into the program.

StartMIT is a two-weeks and a half course held every January that is aimed at exposing students to entrepreneurial ecosystem elements. During the course, MIT students hear from leaders in innovation, participate in activities to refine their projects, and attend events with alumni and other leaders in the Boston entrepreneurial ecosystem. The covered topics include (but are not limited) equity division, models of funding, marketing, scalability, and team building. Additionally, the program possesses some of the campus resources already available to students. The main activities of StartMIT are:

- Networking with peers
- Listening to guest entrepreneur speakers
- Doing independent exercises to apply what have been learned
- Working with small groups on entrepreneurial ideas
- 1:1 support with MIT Entrepreneurs in Residence



Lund University (Sweden)^{121,122}

There is a one-year Entrepreneurship and Innovation master program. The programme consists of the following courses:

- Entrepreneurial Process and Opportunity Recognition
- Business Model Development
- Entrepreneurial Project
- Entrepreneurial Marketing
- Entrepreneurial Leadership
- Entrepreneurial Finance

^[119] <https://innovation.mit.edu/resource/startmit/>

^[120] <https://entrepreneurship.mit.edu/startmit-iap/>

^[121] <https://www.lunduniversity.lu.se/sites/www.lunduniversity.lu.se/files/2020-09/entrepreneurship-innovation-fact-sheet.pdf>

^[122] <https://www.lunduniversity.lu.se/lubas/i-uoh-lu-EAGEI>

Guest lectures are an important part of the program. Experts from various areas related to entrepreneurship and innovation are regularly invited to share their expertise and hold workshops. The program is designed to provide the tools necessary for starting new independent businesses including research commercialisation or to work in advisory roles to new venture start-ups and tools to work in highly uncertain or risky market environments.

Students can participate in activities at the Ideon Innovation incubator, including the opportunity to sit in their co-working space, participate at the university pitching competition, Venture Cup competition, and attend Trendspotting at Lund University seminar series. Graduates get a fast-track application process to join the VentureLab incubator.

To sum it all up, education is an important part of creating a successful business. Universities should not just create an educational program for people who are sure they want to be entrepreneurs, but also give an opportunity for others to try it on during a course, for example on minors. Another great idea is having a short module for new students that tells and shows them elements of the entrepreneurial ecosystem within the university.

In general educational programs are more or less the same and cover different business functions like marketing and finance as well as different stages of venture like ideation and attracting investments.

2.6. Forms of interaction with industrial partners, corporations and SMEs in the context of the development of technological entrepreneurship among students

Collaboration between universities and industry can be mutually beneficial and bring the improvements in both the educational programs of universities and the methods, technologies, and business models of corporations. The entrepreneurial students benefit from university-industry collaboration.

Building partnerships is a complex process that requires mutual efforts and interest. However, formation an understandable cooperation model between university and industry needs universities to consider common values, flexibility of programs to support students, projects and start-ups. It can significantly simplify the formation of sustainable interaction.

Currently, student entrepreneurs do not have to choose between getting an education and starting a business. In fact, the student has a better chance of being successful as an entrepreneur if he or she develops idea further in an incubator located at the university. According to a study¹²³ among more than 150 university incubators and almost 900 companies established therein, enterprises created at universities allow student entrepreneurs create more jobs and generate more financial flow (turnover) than enterprises created outside university with other support mechanisms.

Reforming university structures to optimize cooperation with industry

It is not always easy for industrial partners to collaborate with universities. Industrial partners expect to receive assistance and simplification of bureaucratic processes from university administration, but cooperation is often fragmented and requires interaction with various departments of the university, that arises obstacles and decrease the efficiency of collaborative actions.

The development of a university culture of interaction with industry representatives should be an institutional priority. Critical success factors in forging partnerships between industry and universities are the organizational model of the collaboration structure and the competence and involvement of staff¹²⁴.

Universities can improve collaboration mechanisms by creating a transparent procedure for industry partnerships. One step could be to appoint a dedicated partnership coordinator to help business partners understand the processes and mechanisms of collaboration at the university and navigate the interactions. Coordination allows the university to play a leading role in cooperation.

A positive example is the development of cooperation between universities and industry in the UK (Innovative Manufacturing Initiative). By attracting additional research funding and supporting joint programs, the Innovative Manufacturing Initiative has spawned many new joint research and industrial projects. The

^[123] Lasrado, V., Sivo, S., Ford, C. et al. Do graduated university incubator firms benefit from their relationship with university incubators?. *J Technol Transf* 41, 205-219 (2016).
<https://doi.org/10.1007/s10961-015-9412-0//>
<https://link.springer.com/article/10.1007/s10961-015-9412-0>

^[124] Rybníček, R., Königgruber, R. What makes industry-university collaboration succeed? A systematic review of the literature. *J Bus Econ* 89, 221-250 (2019).
<https://doi.org/10.1007/s11573-018-0916-6//https://link.springer.com/article/10.1007/s11573-018-0916-6>

implementation of the initiative showed gaps in the industry's ability to absorb cutting-edge research results. New iterations of UK government projects in the area of knowledge transfer policy to industry, society and the economy have resulted in the target indicator "Knowledge Mastery System"¹²⁵.

Some universities, such as Imperial College London, have always maintained close partnerships with industry. Imperial College London currently has over 500 technology partners, and contributions from industry partners are a significant contributor to the college's research income.

Partnerships between universities and industry continue to evolve as the benefits of these options for interaction:

- access to advanced developments
- recruiting talents
- approbation of developments in practice
- support for student entrepreneurship and startups
- corporate acceleration of innovation
- social interaction
- raising public awareness of the scientific work of universities and the public contribution of corporations

These allow to mutually accelerate the development of both the university and industrial partners.

Models of interaction between universities and industry

(partner programs, incubators with strong involvement of industry)

Case. Imperial Business Partners

Imperial Business Partners¹²⁶ offers corporate partners access to the best talent, technology, expertise, and capacity of Imperial College London.

Through dedicated pathfinding events led by Industry Partner Liaison Managers, the College provides companies the opportunity to connect with technological projects and capitalize knowledge, talent, capabilities and specific resources of Imperial College London. The College builds long-term productive relationships with businesses around the world.

More than 20 partners have joined the college network¹²⁷ and members benefit from a close relationship with Imperial College, one of the best universities in the world and the UK's most innovative university. The College strives to create a conducive environment for the exchange of knowledge, opinions, fostering partnerships to accelerate innovation and find promising areas for new developments.

Case. MIT Industrial Liaison Program

The MIT Industrial Liaison Program¹²⁸ (ILP) aims to create and strengthen

^[125] <https://re.ukri.org/knowledge-exchange/knowledge-exchange-framework/>

^[126] <http://www.imperial.ac.uk/enterprise/business/partners/>

^[127] <http://www.imperial.ac.uk/admin-services/enterprise/business/partners/ibp-membership/ibp-members/>

^[128] <http://ilp.mit.edu/>

mutually beneficial relationships between MIT and corporations around the world. Founded in 1948, the ILP continues to be a key instrument in MIT's industrial ties.

- More than 200 of the world's leading companies participate in the Industrial Liaison Program to advance MIT's research programs.
- Partner companies account for approximately 53% of all corporate donations and research grants at MIT.

With technology advances and knowledge discoveries accelerating continuously, and an increasingly demanding corporate finance environment, ILP is committed to creating mechanisms for productive engagement with industry. The ILP program is continually evolving to meet the interests, needs and aspirations of MIT faculty members and corporate partners.

Case. University of California, Berkeley

The Berkeley SkyDeck Foundation¹²⁹ is offering up to \$ 100,000 for projects participating in its six-month program. Entrepreneurship students receive \$ 50,000 on screening and \$ 50,000 on successful completion of the three-month mark. The incubator can also invest up to 10% of the required funds in the first round of funding, with a \$ 2 million cap. Participating companies can use funding for a range of business operations such as recruiting, product development, and marketing.

Born in Berkeley successful projects are:

- Flourish¹³⁰, platform for attracting personal finance
- Empire Biotechnologies¹³¹, which developed a therapeutic drug for the digestive system
- Cooljamm¹³², the company that created AI for music generation
- Chameleon Biosciences, a pioneer company in gene therapy

Case. Harvard University

For Harvard students, the Venture Incubation Program¹³³ (VIP) has been created as part of the Harvard Innovation Laboratory Foundation, which is a 12-week program of mentoring, additional training, exchange of experience and funding. The Harvard Innovation Lab is also participating in the President's Innovation Competition (USA), in which students can win up to \$ 75,000 in cash to pursue an idea.

For Harvard alumni, there is Launch Lab X¹³⁴, a Harvard alumni incubator where alumni can receive \$ 100,000 in funding for their project.

^[129] <https://skydeck.berkeley.edu/>

^[130] <https://www.flourishsavings.com/>

^[131] <http://empirebiotechnologies.com/>

^[132] <http://www.hum-on.com/>

^[133] <https://innovationlabs.harvard.edu/venture-incubation-program/>

^[134] <https://innovationlabs.harvard.edu/launch-lab-x/>

VIP used companies:

- LeverEdge¹³⁵, a financial startup that allows students to get a loan for studying at a more favorable rate
- STEMgem¹³⁶, a technology project that creates sets of wearable devices for elementary school students
- Evisort¹³⁷ (whose founders created Forbes 30 to 30), a project that uses AI to improve the user experience with legal documents

Massachusetts Institute of Technology, USA

The Massachusetts Institute of Technology (MIT) Delta v Incubator¹³⁸ is an educational startup accelerator for student entrepreneurs looking to build a viable and sustainable business. Students participating in the incubator receive one-to-one counseling, intensive training, mentoring from industry representatives, opportunities to connect with investors and entrepreneurs, and funding through summer programs in New York and MIT.

Delta v provides up to \$ 20,000 in non-equity funding for each venture (based on the achievements of the founding students), \$ 2,000 per month in living expenses, and the opportunity to speak to investors at MIT demo events. The priority of the program is projects and startups in the early stages of development.

The companies that have passed the program Delta v:

- Embr Labs¹³⁹, creates wearable devices and develops technologies for heating and cooling
- W8X¹⁴⁰, sports technology project developing robotic strength training programs
- Synaps¹⁴¹, digital outdoor advertising launch project

Case. Stanford University, USA

There is a non-profit organization StartX¹⁴² at Stanford that positions itself as a community of like-minded entrepreneurs. Distinctive features of the organization are the lack of time frames for the passage of acceleration / training and non-prioritization of training for participants.

However, there are clear acceleration programs at StartX, such as Student-in-Residence (SIR) for Stanford's students, which is a six-month incubation program offering up to \$ 8,000 in financial aid per project founder, plus additional support, office space, individual training and mentoring, project

^[135] <https://leveredge.org/>

^[136] <http://www.stemgem.com/>

^[137] <https://evisort.com/>

^[138] <http://entrepreneurship.mit.edu/accelerator/>

^[139] <https://embrlabs.com/>

^[140] <https://weight-x.com/>

^[141] <https://www.synapslabs.com/>

^[142] <https://startx.com>

demonstration at the investor's bottom, and support at StartX on an ongoing basis. StartX member companies raise an average of \$ 7.2 million in funding.

Projects supported by StartX include:

- NALA¹⁴³, financial project, mobile payments for sub-Saharan Africa
- MylaBox¹⁴⁴, project service for the provision of international B2C trade
- MindRight¹⁴⁵, a community based project that helps adolescents cope with trauma through personalized, daily coaching and mental health support through text messages

Case. University of Pennsylvania, USA

The Wharton School at the University of Pennsylvania (UPenn)¹⁴⁶ offers a variety of student tools, from educational tools, including free basic entrepreneurship lessons on Coursera, to specialized entrepreneurship courses focusing on specific topics, and the Scale School San Francisco seminar series for facilitate business scaling.

UPenn hosts an annual StartUP Challenge where student entrepreneurs can submit projects and win up to \$ 135,000 to launch their venture.

The VIP-C University incubator¹⁴⁷ is open to any entrepreneur who is ready to promote their idea. The best startups in VIP-C are invited to join VIP-X, a three-month intensive program with additional resources and mentoring to take their business to the next level. The incubator includes seed funding, coworking space, workshops, and access to guest speakers.

Successful projects that originated at Wharton are:

- Titan¹⁴⁸, public investment fund
- InstaHub¹⁴⁹, a household meter that helps consumers cut down on their electricity bills
- Frank¹⁵⁰, an online platform designed to facilitate federal financial aid applications for colleges

University of Wollongong (UOW), Australia

iAccelerate¹⁵¹ is a business accelerator and incubator program run by the University of Wollongong¹⁵² (UOW).

The incubator is located in a new center on the university's innovative campus, in

^[143] <https://www.nala.money/>

^[144] <https://mylabox.com/>

^[145] <https://getmindright.org/>

^[146] <https://www.wharton.upenn.edu/>

^[147] <https://entrepreneurship.wharton.upenn.edu/venture-initiation-program/vip-c/>

^[148] <https://www.titanvest.com/>

^[149] <http://getinstahub.com/>

^[150] <http://withfrank.org/>

^[151] <https://www.iaccelerate.com.au/>

^[152] <https://www.uow.edu.au/>



The incubator is located in a new center on the university's innovative campus, in a specially designed and constructed building. The objectives of the program are to organize support for startups by major industrial partners of the university to ensure and accelerate the growth and development of projects. A separate priority of the program remains the formation of a community of like-minded entrepreneurs with a vision of the future, goals of project development and enthusiasm for solving the problems of industry and society.

iAccelerate acts as UOW's premier tool for building sustainable businesses that have a positive impact on the region, Australia and the world. The program focuses on projects using new technologies that can be scaled up and applied in the global market.

Case. Global Ecosystem of Innovation and Entrepreneurship at the State Level, Sweden

Swedish society encourages innovation and entrepreneurship¹⁵³. Certain factors such as the country's social stability, ample opportunities to access government support, and low levels of social stratification help Sweden's young entrepreneurs to succeed.

The Welfare State plays a key role in the development of the Swedish business environment, thanks to the fact that there is a social safety net that, in the event of a business, start-up or project failure, allows for a fresh start, giving entrepreneurs the freedom to experiment and take risks.

The state priority of education and research activities also has a positive impact on the implementation of innovative start-ups and innovations in general.

Sweden invests in R&D more than 3% of GDP, which is more than in many other EU countries and the world. Green technologies and life sciences are two areas in which Swedish researchers and companies are particularly successful. The

^[153] <https://sweden.se/business/innovation-in-sweden/>

Swedish government is creating governance structures that formulate national development strategies, such as a national life sciences strategy, to further develop the area. Research centers in the field of life sciences have been established:

- H2 Healthhub¹⁵⁴
- SciLifeLab¹⁵⁵
- Testa Center¹⁵⁶

Sweden Governmental support facilitates the university-industry collaboration

The Vinnov State Agency¹⁵⁷ plays a major role in coordinating Swedish research. The innovative agency promotes and funds research projects in a wide range of fields, from healthcare and transportation to industrial materials and smart cities.

KK-stiftelsen¹⁵⁸ (Knowledge Foundation) finances research and development of student competencies at Swedish university colleges and new universities.

The Swedish Agency for Economic and Regional Growth¹⁵⁹ (Tillväxtverket) also finances and conducts activities to increase the competitiveness and attractiveness of entrepreneurship in Sweden.

The development and improvement of infrastructure is a vital issue for the development of the state, to which Sweden pays increased attention. Railways, broadband, energy, telecommunications are the backbone of the infrastructure to foster an innovative and entrepreneurial culture.

In the 1990s, the Swedish government of Sweden allocated large funds for the development of broadband, which, combined with concessional terms for lending to IT projects, helped create a new type of society. A new broadband strategy was adopted in 2016, aiming to connect every home in Sweden to high-speed Internet in 2025¹⁶⁰.

The Swedes make up 0.13% of the world's population, however, the influence on the development of technology and innovation in the world is quite large. Sweden tops the European Innovation Scoreboard¹⁶¹ published by the European Commission. It assesses the strengths and weaknesses of national innovation systems and helps countries identify areas that need to be accelerated. According to the Global Innovation Index¹⁶² and the Legatum Prosperity Index¹⁶³, Sweden is ranked 2nd and 4th.

^[154]<https://www.h2healthhub.com/>

^[155]<http://www.scilifelab.se/>

^[156]<https://testacenter.com/>

^[157]<https://www.vinnova.se/en/>

^[158]<http://www.kks.se/om-oss/in-english/>

^[159]<https://tillvaxtverket.se/english.html>

^[160]<https://www.government.se/information-material/2017/03/a-completely-connected-sweden-by-2025--a-broadband-strategy/>

^[161]https://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

^[162]<https://www.globalinnovationindex.org/home>

^[163]<https://www.prosperity.com/rankings>

Challenges in the development of an entrepreneurial culture in Sweden

Despite the assessment of Sweden as one of the most competitive and economically developed countries in the world¹⁶⁴ with developed support measures, there are a number of problems that hinder the development of an innovative and entrepreneurial culture.

The first group of negative factors is high taxes and complex labor legislation with developed social protection. Despite the obvious benefits of social protection in hiring for the population, for new companies, start-ups and entrepreneurial projects it creates significant difficulties in hiring.

The second group of factors is high rental rates for premises, a shortage of housing and office space in large cities. The identified problems make Stockholm less attractive for young entrepreneurs in comparison with other EU cities.

The third group is the high cost of studying at universities in Sweden for foreigners, which serves as a barrier to attracting young teams and talents from less developed countries.

The fourth group is climatic conditions, which, in combination with the previous groups of problems, slow down the development of the entrepreneurial and innovative culture in Sweden.

Case. Norway

Scandinavian countries, namely Norway, are included in the world rankings for promoting innovation and entrepreneurship thanks to a targeted policy of stimulating the development of university innovations, developments and projects of students and start-ups. The agents of change are university and independent incubators that collaborate and provide various types of support to young entrepreneurs.

Table. Startup incubators, venture funds, communities and entrepreneurship support tools in Norway¹⁶⁵

Name	Description	Characteristics
STARTUP NORWAY ¹⁶⁶	A private organization founded in 2011 by entrepreneurs in Norway who want to build a stronger and more inclusive startup community.	Round tables for exchange of experience, seed funding collection programs, start-up campus for participants, 15+ support programs for various areas of projects

^[164] <https://www.weforum.org/reports/how-to-end-a-decade-of-lost-productivity-growth>

^[165] <https://medium.com/mentornity-blog/25-accelerators-and-incubators-in-norway-baac0b16c325>

^[166] <https://startupnorway.com/>

Inkubator Salten¹⁶⁷	The incubator assists in developing a business idea into a growth company, by providing finance, doing market analyzes, developing business plans, product/ concept development, formal paperwork, legal assistance, and support till the first sale, typically for a few years if needed.	Courses for those wishing to form their own project / startup idea, a pre-incubator, working with projects at an early stage, a full stack of opportunities for developing an idea, from the seed stage to entering the market.
Industri utvikling vest¹⁶⁸	Territorial incubator aimed at developing new activities in the Bergens, Mongstad and Nordhordland regions. Mongstad is the starting point for the development of new business concepts, as it has significant industry experience, availability of raw materials, a well-established infrastructure, and many functioning enterprises. Today, around 3,000 jobs are associated with the Mongstad area.	Assistance in the development of existing businesses in the region. 5-year program period with designated KPIs - 10 new enterprises + an increase in the number of jobs in the region.
Oslo Cancer Cluster Incubator AS¹⁶⁹	It is part of the Oslo Cancer Cluster innovation park. The incubator supports the commercialization of promising oncological biotechnologies. The incubator provides a dynamic, creative and professional environment for the growth of scientists and innovative startups. The incubator's team offers members business development services, access to an international	Orientation not only to students, but also to scientists. Provision of laboratory equipment, a wide range of opportunities to promote the project.

^[167] <http://www.inkubatorsalten.no/>

^[168] <https://www.industriutviklingvest.no/>

^[169] <https://occincubator.com/>

	network of key industry players, and facilitates contact with investors.	
Alliance Venture ¹⁷⁰	Founded in 2001 by a team of experienced executives with broad business, financial and entrepreneurial experience. The team is backed by a network of strategic alliances and over 25 executive investors. Alliance Venture Spring Foundation, which was founded in June 2014 with a capital of 510 MNOK. Investors include Telenor, Opera Software, Kistefos, Umoe, DNB, MP Pensjon, Oslotech and Innovation Norway. An extensive network of international partners, our own project financing fund and a network of experts are used to form a continuous flow.	
Sprettert ¹⁷¹	A group of investors specializing in early investment in the Stavanger region, Norway. The group was formed after passing the Angel Challenge in Stavanger, with the goal of investing in local startups with close-knit teams.	
Mashup ¹⁷²	Norwegian technology accelerator founded by ICT-Norway, Music Norway, 657Oslo, Phonofile and WiMP. Goal: to increase the number of innovations in	3-month office space program, strong online business community, mentoring industry consultations, private sector and public sector

^[170] <https://allianceventure.com/>

^[171] <https://www.sprettert.com/>

^[172] <http://mashupnorway.com/>

	the Norwegian society, helping small businesses and start-ups to reach a new level; stimulate the development of internal entrepreneurship in established businesses and establish links with startups. Private capital, venture capital and crowdfunding are used as instruments, additional platforms for private financing are being created.	partnerships.
Katapult Accelerator ¹⁷³	The mission to create a positive impact via technology as a key driver of change due to the untapped talents of the world.	3-month hands-on business scaling program, access to a wide range of thematic mentors and mentors around the world. Competence in the application of AI in business, adaptation of AI-based solutions for startups. Access to investors and basic investments.
Innoventus sor ¹⁷⁴	Regional innovation company, incubator representing Sørlandet. Focused on projects that will help drive growth, innovation and technological renewal in the region. The company actively works with entrepreneurs, businesses, government agencies, the academic and research community in Norway to create sustainable solutions for the future.	Prioritization of projects for the commercialization of innovative developments with an increase in the number of high-tech jobs.
FPN ¹⁷⁵	A non-profit organization whose activities are aimed	Corresponds to EU fundingdirection WP4 -

^[173] <https://katapultaccelerator.com/>

^[174] <https://innoventussor.no/>

^[175] <http://grebeproject.eu/about/partner-overview/narvik-science-parks/>

	at developing new businesses based on the results of technological research. Research Park in Narvik (FPN) is working on the commercialization of developments in the field of Arctic technologies, ecology, renewable energy.	Impact of environmental conditions in NPA and arctic regions. Experience in conducting mergers of start-ups and multi-tier financing.
Innovation Norway ¹⁷⁶	One of the most important tools of the Norwegian government for the development of innovation for Norwegian enterprises and industry, is the official trade representative of the Norwegian government abroad. Provides consulting, advertising and networking services. The marketing promotion of Norway as a tourist destination is also considered one of the important tasks of the organization.	They are represented in more than 30 countries around the world and in all counties in Norway. Provides support in intellectual property matters, selects suitable mentors from companies in the market. Contains several curricula for entrepreneurship training, including marketing and market understanding. Has a wide range of financial instruments to support projects at different stages.
Valide ¹⁷⁷	Valide operates one of the leading incubators in Norway and ranks first in the SIVA incubator system. Possess over 20 years of experience in developing and supporting new ideas to create successful commercial companies. Approximately 500 projects are evaluated annually, and incubation agreements are concluded with approximately 50 companies per year.	Several tools for the development and support of entrepreneurial projects and startups: technology transfer office, incubator, accelerator. They finance projects at an early stage, have a working mechanics of clustering projects and startups, which accelerates the development of cluster members.

^[176] <https://www.innovasjon Norge.no/en/start-page/>

^[177] <https://valide.no/>

Techmakers¹⁷⁸	An accelerator focused on the development of green technologies and projects in the field of biotechnology. Implements programs not only in Norway, but in the Scandinavian region as a whole – Techmakers Bioeconomy – A program for small and medium-sized businesses in the bioeconomy sector in Norway and Sweden.	Programs for projects in the field of biotechnology, alternative energy, oil and gas industry. Helping teams in recruiting specialists, project support, mentoring, organizing experience exchange with other entrepreneurs in the industry. Development network of industrial partners.
Norway Health Tech¹⁷⁹	Norway Health Tech Academy aims to provide a platform where participants can form a team to translate ideas and develop competencies. The project is aimed at supporting innovative developments in the field of healthcare and biotechnology, commercializing the results.	Provides support for biotechnological projects when scaling to the markets of other EU countries and beyond (UK, China, USA). Own CRM system. Located in the Oslo Science Park, over 200 partner companies.
Kjeller Innovasjon Incubator¹⁸⁰	The goal is to realize the potential and benefits of innovative developments for society. Kjeller Innovation's excellence lies in the areas of: energy, space technology, bioeconomy and biotechnology, smart technology, mobility.	Project support from the idea stage to a company scalable to the global market. 25 years of experience, understanding the seed stage of projects, developing a network of partners. The main partners are research centers in Kjeller, Os and Oslo. Each partner has their own unique technologies and conducts world-class research in their respective niches.

^[178] <http://www.techmakers.no/>

^[179] <https://www.norwayhealthtech.com/>

^[180] <https://www.kjellerinnovasjon.no/hjem/>

The USN Center for Social Entrepreneurship and Social Innovation, is a community of professionals and a repository of excellence for developing social projects based on cutting-edge research in the Norwegian welfare society.

The forms of interaction between universities, innovative entrepreneurial projects and industry are different, but they pursue certain goals, the obvious ones are making a profit, being at the same time socially responsible, creating new high-tech jobs and improving the quality of life of society with the help of new R&Ds.

Incubators and accelerators at universities, most often with a pronounced industry focus, are used as a convenient format all over the world. The main advantages of university incubators can be the simplification of interaction with industrial partners due to the university brand, concentration of competencies and equipment at one point, as well as easy access to the youth most interested in entrepreneurship.

The following can be distinguished as the distinctive features of the model of a successful incubator that interacts with the industry and attracts talent within the university:

- 1 wide network of partners - allowing for more effective communication between participants
- 2 mentoring from representatives of the real sector - helps entrepreneurs to more accurately identify the problems of the real sector and successfully solve them
- 3 support to project at different stage of development - makes it possible not to miss interesting ideas that are in the seed stage for which minimal support is needed to start growth
- 4 the presence of a laboratory / technical park and / or testing area - technological projects, start-ups and entrepreneurial ideas require transparent and accessible conditions for approbation and verification of prototypes without contact with many counterparties or government technical supervision services
- 5 legal, patent and information support, administration support are necessary components for any young company that has begun its development, however, many projects cannot overcome the difficulties associated with the registration of employees, payment of taxes, duties, patent royalties for various reasons, therefore, services are needed to facilitate these processes

The Scandinavian region is a favorable environment for the development of student entrepreneurship, but it is not without its drawbacks, some of which can

^[181] <https://www.usn.no/forskning/hva-forsker-vi-pa/helse-og-velferd/sesam-senter-for-sosialt-entreprenorskap-og-samskapen-de-sosial-innovasjon/>

significantly hinder the speed of development of the entrepreneurial ecosystem of the region and the innovative society as a whole, for example: high taxes, high cost of living, rent, confused legal framework of legislation. The identified problems can be resolved by creating models of university incubators that are most closely connected with industrial partners on a sectoral basis, within which representatives of the real sector, with the help of competencies, experience and finance, can significantly accelerate the development of entrepreneurial culture.

2.7. Motivation and stimulation of students for technological entrepreneurship and factors influencing its formation

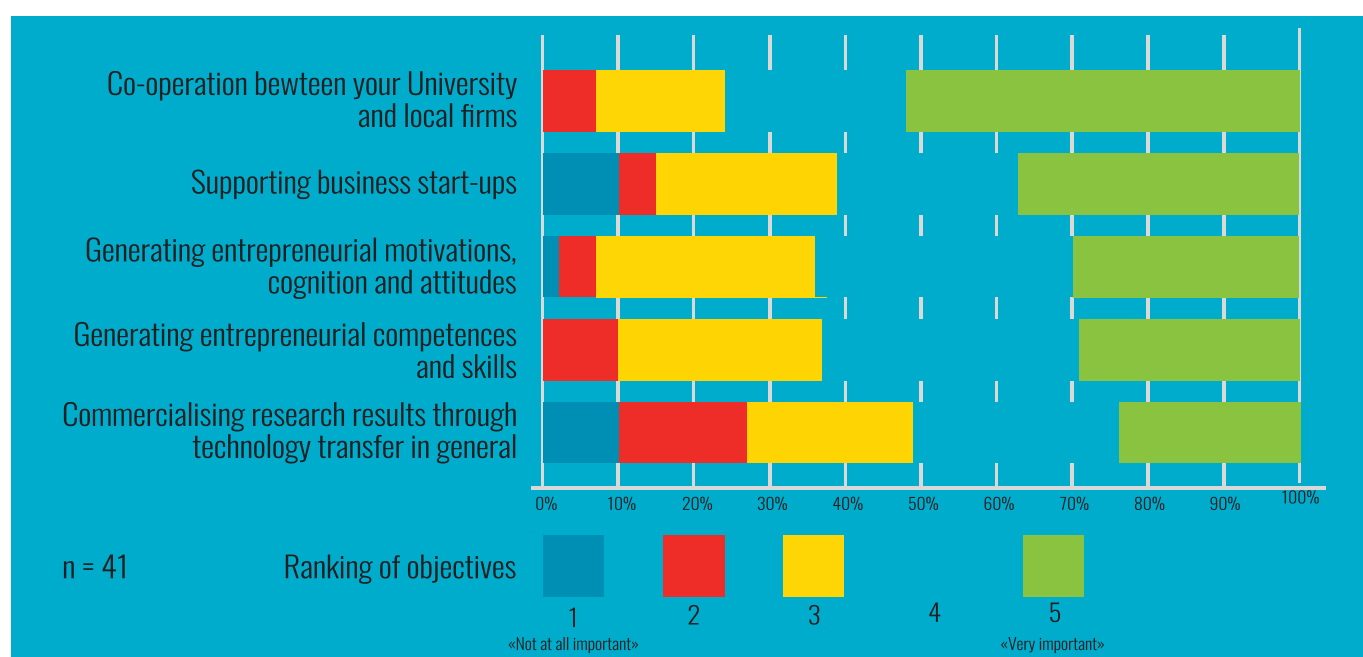
Technological entrepreneurship can provide many opportunities for students for self-realization, economic success, gaining recognition and personal and professional development. However, not each and every university student is interested to start business or participate in entrepreneurship activities.

The issue of motivating and stimulation of students in the formation of an entrepreneurial culture at the university is crucial for student entrepreneurship. Motivating students to create a business and commercialize outcomes of their R&D and learning activities depends on many parameters. The study on stimulating entrepreneurial mindsets and behaviors in east German higher education among the rectors of 41 Universities in Germany, shows that the rectors consider as factors of motivation student for entrepreneurship what is reflected in the University Strategy:

- co-operation between university and local firms
- supporting business start-ups
- generating entrepreneurial motivation, cognition, and attitudes
- generating entrepreneurial competencies and skills
- commercializing research results through technology transfer in general¹⁸²

Taking into account the range of factors found in the study “Stimulating entrepreneurial mindsets and behaviors in east German higher education: State of play and inspiring practices” across this section there will be demonstrated practices of motivating and stimulating student to engage students into entrepreneurship.

Table. Motivating students and influence of the parameters in the context of creating a business and commercializing learning outcomes¹⁸³



^[182]Stimulating entrepreneurial mindsets and behaviours in east German higher education: State of play and inspiring practices https://www.oecd.org/site/cfecpr/OECD_Booklet_EN-Web.pdf

^[183]Stimulating entrepreneurial mindsets and behaviours in east German higher education: State of play and inspiring practices https://www.oecd.org/site/cfecpr/OECD_Booklet_EN-Web.pdf

The influence of different types of resources on the entrepreneurial activity of the university

Universities are organizations that carry out educational activities, research, various related services and intellectual commercialization. Universities have elements that are usually associated with the achievement of results in such areas, such as teachers' salaries, bonuses for results, research costs, laboratory costs and equipment. Faculty members play a key role in the functioning of universities and carry out activities that enable universities to perform. As the duties of teachers, which were previously limited to education and research, have now expanded to include support for entrepreneurship and innovation, there is an increasing emphasis on the role of teachers in starting a business for students, and their salaries and additional bonuses are seen as resources that can affect the intensity and quality. entrepreneurial activity of the university.

Research funding is a key parameter for assessing the success of universities^{184,185}. Research funding, along with labor costs, laboratory equipment costs and equipment procurement, are internal resources of the university. Universities view research funding as a resource influencing entrepreneurship because it can help ensure the continuity and safety of innovative technologies and increase the likelihood of starting a business.

The external resources associated with the opening of the expansion of entrepreneurial activity, they are the resources received from outside the university from representatives of business, foundations, NGOs and the state. External resources also stimulate the development of universities and the growth of their performance indicators, as well as entrepreneurial activity¹⁸⁶. However, there is conflicting evidence about how government funding affects the commercialization of university developments and startups. Government funding is often directed towards basic research, which can impede commercial activities such as business and start-ups. Corporate research funding can have a significant impact on startups. Funding for corporate research is also important for universities to contribute to their effectiveness. Obtaining research funding from industry representatives allows to run joint research with companies and facilitates knowledge transfer, as such processes improve market understanding and increase the likelihood of using the results to start a business¹⁸⁷. However, while partnerships with companies can boost commercially oriented research, it can also curtail startup activity because research funding companies want patent rights for inventions¹⁸⁸.

The renown of University professors within academia, the Hirsch index and the reputation of university professors also affect the intensity of startup activities

[184] Yoonseock Lee, Young-Hwan Lee // University Start-Ups: The Relationship between Faculty Start-Ups and Student Start-Ups Sustainability 2020, 12(21), 9015; <https://doi.org/10.3390/su12219015//>

[185] Lee, YH. Determinants of research productivity in Korean Universities: the role of research funding. J Technol Transf (2020). <https://doi.org/10.1007/s10961-020-09817-2>

[186] Ammon J. Salter Ben R. Martin The economic benefits of publicly funded basic research: a critical review // Research Policy Volume 30, Issue 3, 1 March 2001, Pages 509-532 // [https://doi.org/10.1016/S0048-7333\(00\)00091-3](https://doi.org/10.1016/S0048-7333(00)00091-3)

[187] Dzamila Bienkowska, Magnus Klofsten, Einar Rasmussen PhD Students in the Entrepreneurial University - Perceived Support for Academic Entrepreneurship // Volume 51, Issue 1 Special Issue: Integrating Higher Education and University-Business Cooperation: synergies, potential and challenges March 2016 Pages 56-72 // <https://doi.org/10.1111/ejed.12160>

[188] Dante Di Gregorio ab Scott Shane a1 Why do some universities generate more start-ups than others? // Research Policy Volume 32, Issue 2, February 2003, Pages 209-227 // [https://doi.org/10.1016/S0048-7333\(02\)00097-5](https://doi.org/10.1016/S0048-7333(02)00097-5)

within the university. Research shows that it not only fosters innovative ventures at universities, but also enables high-quality startups¹⁸⁹, because it directly influences on the likelihood of funding a startup from representatives of the industry, government, or venture capital funds.

The presence and functionality of project offices, technology transfer offices also positively affect university startups. Technology transfer offices act significantly in the commercialization of technology in situations where teachers and students fully own their inventions but cannot initiate startups due to a lack of information about the commercialization of technologies, the market and the nuances of doing business¹⁹⁰. Technology Transfer Offices have the expertise and experience in relevant legal and regulatory issues related to technology commercialization and can assist with seed investment, corporate governance, and portfolio management. A separate factor influencing the intensity of entrepreneurial activity in universities is the presence of active student start-ups. In case that startups are already operating at the university, the further development of other entrepreneurial projects of students will take place in a mutually reinforcing and positive environment¹⁹¹. The importance of having student startups should not be underestimated, and the world's leading universities are currently running various training and support programs for student startups, which are expected to further develop more serious entrepreneurial projects for educators: startups and spinoffs.

The student start-up support system at universities includes additional education that fosters potential entrepreneurship, modeling that helps students create and test ideas, and incubation programs that help them develop their startups into independent companies¹⁹². Promoting student startups requires encouraging student intentions to start a business, which requires education in how to start a business at a university¹⁹³, as well as special lectures on startups and hands-on education and experience. Through teaching business theory and analyzing real-life experience of commercialization, it is possible to increase entrepreneurial activity at the university¹⁹⁴.

Entrepreneurship training is an educational process aimed at improving

[189]Tischler, Joachim (2014) : Characteristics of technological base, pace of technological development, and growth of young technology-based firms, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und

Hamburg//<https://www.econstor.eu/bitstream/10419/96156/1/Characteristics%20of%20technological%20base%2c%20pace%20of%20technological%20development%2c%20and%20growth%20of%20young%20technology-based%20firms.pdf>

[190]Joshua B.Powers, Patricia P.McDougall//University start-up formation and technology licensing with firms that go public: a resource-based view of academic entrepreneurship//Journal of Business Venturing Volume 20, Issue 3, May 2005, Pages 291-311//<https://doi.org/10.1016/j.jbusvent.2003.12.008>

[191] Student entrepreneurship and the university ecosystem: a multi-country empirical exploration by Michael H. Morris; Galina Shirokova; Tatyana Tsukanova //European J. of International Management (EJIM), Vol. 11, No. 1, 2017//<https://doi.org/10.1504/EJIM.2017.081251>//<http://www.inderscience.com/offer.php?id=81251><http://www.inderscience.com/offer.php?id=81251>

[192]Slinger Jansena, Tommy van de Zandea, Sjaak Brinkkempera, Erik Stama, Vasudeva Varma //How education, stimulation, and incubation encourage student entrepreneurship: Observations from MIT, IIT, and Utrecht University// The International Journal of Management Education Volume 13, Issue 2, July 2015, Pages 170-181//<https://doi.org/10.1016/j.ijme.2015.03.00160>

[193]D.Urbano, S.Aparicio, M. Guerrero, M.Noguerad, J. Torrent-Sellense// Institutional determinants of student employer entrepreneurs at Catalan universities//<https://doi.org/10.1016/j.techfore.2016.06.021>

[194]Prior Knowledge, Potential Financial Reward, and Opportunity Identification Dean A. Shepherd, Dawn R. DeTienneFirst Published January 1, 2005 Research Article <https://doi.org/10.1111/j.1540-6520.2005.00071.x>
<https://doi.org/10.1111/j.1540-6520.2005.00071.x>

entrepreneurial attitudes and skills¹⁹⁵ and ranges from the establishment of business plans to content creation. Preparation of a business plan is an important part of the curriculum for educating students in entrepreneurship, as entrepreneurial intentions can be honed, and relevant skills and knowledge developed. Venture creation is facilitated through programs that impart understanding of the process of establishing and operating a venture. Various methods are used in entrepreneurship education, but this study focused on start-ups in relation to a type of team project, Capstone Design, and start-up clubs.

Capstone Design is a project-based teaching method that achieves learning objectives based on the experience of a project-based practice¹⁹⁶. Project-based learning is similar to real life and improves practical meaning by linking abstract knowledge to concrete reality. The use of project-based learning in education such as Capstone Design and entrepreneurship development, which requires varying degrees of knowledge and skills, from business planning to startups, have been identified as effective teaching methods¹⁹⁷. Due to Capstone Design, students are able to collaborate with industry, and this experience is likely to have a positive impact on startups as it provides an opportunity to develop interest and knowledge about specific industries and markets.

Startup Club is a format of interaction in which students interested in starting a business can share ideas. This collaborative learning activity outside the mainstream curriculum is a key element of entrepreneurship education programs¹⁹⁸. Mentoring, advising, guiding and promoting startups is carried out through Startup Club activities, which can improve students' ability to identify startup opportunities, develop startup elements, improve management skills and develop entrepreneurship. Entrepreneurial education programs such as Startup Clubs and Capstone Design are an important source of student entrepreneurial attitudes towards technology development.

Starting a business at the university has become one aspect of the role and new function of the university, along with various types of support provided to stimulate university start-ups and entrepreneurship, including the development and implementation of various educational programs at the university level.

To effectively promote university startups, it is important to analyze the relevant resources affecting university startups in each case. At the same time, the direction of work and the presence of start-ups among teachers and researchers of the university has a significant impact on the appearance of student start-ups, but not vice versa. The cost of teaching staff salaries and funding research by national and local governments have a significant positive impact on the start-ups of teachers and staff. Funding start-up support activities on the

[195] Fayolle, A., Gailly, B. and Lassas-Clerc, N. (2006), "Assessing the impact of entrepreneurship education programmes: a new methodology", *Journal of European Industrial Training*, Vol. 30 No. 9, pp. 701-720. <https://doi.org/10.1108/03090590610715022>

[196] Sofie M. M. Loyens & Joshua Magda & Remy M. J. P. Rikers // Self-Directed Learning in Problem-Based Learning and its Relationships with Self-Regulated Learning / *Educ Psychol Rev* (2008) 20:411-427 // *Sustainability* 2020, 12(19), 8200; <https://doi.org/10.3390/su12198200> // <https://link.springer.com/content/pdf/10.1007/s10648-008-9082-7.pdf>

[197] Eulalia Skawińska, Romuald I. Zalewski Success Factors of Startups in the EU—A Comparative Study <https://doi.org/10.3390/su12198200>

[198] Michael H. Morris Justin W. Webb Jun Fu Sujata Singhal A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights// *Volume 51, Issue 3 Special Issue: Measuring the Impact of Entrepreneurship Education* July 2013 Pages 352-369// <https://doi.org/10.1111/jsbm.12023>

university campus, the number and capabilities of startup clubs, technology transfer offices and faculties significantly result in the emergence and development of student startups¹⁹⁹.

Case. Students + Startups Program, Trinity University, Dublin, Ireland²⁰⁰

The Students + Startups Program, run by Trinity University, the 80/20 Foundation²⁰¹ (San Antonio, TX) and Geekdom²⁰², is a summer internship where students try themselves out as a startup team. As part of the program, meetings are held with entrepreneurs who have built their companies from scratch and will begin to build their professional network among startups in San Antonio, Texas.

Program offers:

- Scholarship of US \$ 4000
- Free SATX accommodation in the city center
- Access to the Geekdom coworking space
- Real work experience in interesting, young and growing companies
- Get to know the San Antonio startup ecosystem
- Exclusive networking capabilities
- Opportunity to see and try different professional roles in practice

Case. Entrepreneurship and Strat-ups promoting at Hochschule Harz, Germany

Offered at universities of applied sciences the practice-oriented education makes the promotion of startups a logical complement to educational program. Hochschule Harz University of Applied Sciences²⁰³ implements a number of initiatives and programs to promote and support startups, together these programs are designed to encourage and facilitate the process of creating startups²⁰⁴. The learning and motivation process does not start with students at Hochschule Harz University of Applied Sciences, but with activities in its Schools throughout Saxony-Anhalt. On this basis, already during this University programs, various courses are built, as well as start-up networks and seminars, at which ideas can be embodied in a specific form or teams of start-ups can be created. Hochschule Harz events consist of several components. "Ego.on Tour" and "Ego.summer Academy" build on each other and together with "ego.tech-on" are part of the "ego.start-up" run by the state of Saxony-Anhalt with the aim of providing information to young people who want learn more about entrepreneurship.

[199] Yoonseock Lee, Young-Hwan Lee University Start-Ups: The Relationship between Faculty Start-Ups and Student Start-Ups/<https://doi.org/10.3390/su12219015>

[200] <https://studentsstartups.com/mission/>

[201] <https://8020foundation.com/>

[202] <https://geekdom.com/>

[203] <https://www.hs-harz.de/en/>

[204] Stimulating entrepreneurial mindsets and behaviours in east German higher education: State of play and inspiring practices https://www.oecd.org/site/cfecpr/OECD_Booklet_EN-Web.pdf

Motivation for entrepreneurship

Startup support programs for high school students

According to the Marlborough School^[205] in Los Angeles, the high school entrepreneurship education program helps students later start their own startups. There are several high school entrepreneurship programs that not only teach students the necessary entrepreneurial skills, but life skills as well. This program helps to learn:

- Cooperation and teamwork
- Public speaking and self-presentation
- Understanding the principles of data collection and analysis
- Using social networks as a tool to promote interests
- Practice using creativity to solve complex problems

Case. MIT Summer Program LaunchX^[206]

LaunchX, located on the MIT campus, is one of the most well-known and respected programs for high school students in the United States. Every summer, it brings together some of the world's best high school students and supports them in the startup process. LaunchX gives promising young entrepreneurs the opportunity to learn from industry experts. It also provides course materials and support needed to create real products and solve business problems in sustainable ways.

Case. Endevr Virtual Program

Endevr^[207] is a virtual program that helps high school students to create real companies. The program began at the University of Pennsylvania with the participation of founders and mentors from institutions such as Harvard Business School. The program is described as rigorous corporate experience and learning using a highly structured, analytical, evidence-based entrepreneurial learning path. The teaching method of the program is unique, but in fact the training takes place during the creation of a real company. The program promises that each team of participants will have a real working product within two weeks.

Case. Startup incubator for high school students Leangap

Leangap^[208] is a startup incubator that teaches high school students how to build their own scalable companies and non-profits. It helps participants to develop their ideas from concept to launch with real customers and users over the course of one summer. This unique high school entrepreneurship program has three phases:

- 1 Verification. During the first week, student entrepreneurs come up with ideas, form teams, test business models, and create first proofs of concept for their products or services.

^[205] <https://www.marlborough.org/news/~board/stem/post/five-benefits-of-entrepreneurship-education-to-students>

^[206] <https://launchx.com/summer-program/>

^[207] <https://www.endevr.com/>

^[208] <https://www.leangap.org/>

- 2 Creation. The teams create an MVP under the guidance of mentors and a network of partners.
- 3 Growth. The ability to generate sales and grow is what distinguishes real startups from “projects”. With the support of mentors, members get their first sales in no time.

Technological entrepreneurship is of interest to students, first of all, as a way to implement bold innovative ideas, a way to transform scientific work at the university into a real product created by their hands for society. At the same time, entrepreneurship imposes a different set of requirements for competencies in comparison, for example, with scientific activity, expanding it through “soft” social skills that increase the level of integration in the student community and raise social status.

There are quite a few factors influencing the formation of a technological entrepreneurial environment, among which information should be highlighted:

- informational factors: information, training and support
- material factors: financing, equipment, space
- human factors: cooperation, mentoring, solidarity
- business factors: industry cooperation and marketing

The simplest and most obvious of the tools of stimulating and raising motivation of students to start entrepreneurial path are to deliver support and knowledge through student start-up clubs, technology transfer offices and basic entrepreneurship training programs. These can significantly increase the entrepreneurial activity of university students and the success of the implementation of their ideas.

Separately, it is worth noting the synergy of processes in the field of entrepreneurship at the university, which is expressed in the much greater involvement and success of those universities in which teachers and employees are themselves entrepreneurs or startups, which forms an inclusive environment of mutual growth for students.

The formation of an entrepreneurial culture at the university can be accelerated and facilitated if applicants to university already have a certain experience and knowledge base that can be obtained by organizing entrepreneurship schools for high school students.

Chapter 3.

Analysis of the development of student technology entrepreneurship in the border region of Russia and Finland

The current analysis study is running within the STARTUP CONNECT²⁰⁹ project which supports start-up entrepreneurship and SME cooperation and form a community of active and motivated business leaders with ambitions and abilities for global success. The ambition mission of the project is to contribute into the economic prosperity of the cross-border region. The project is executed by the following consortium: Cursor - Kotka-Hamina Regional Development Company (FIN) (Lead partner), ITMO University (RUS), XAMK - South-East Finland University of Applied Sciences (FIN), St. Petersburg Foundation for Small and Medium-sized Enterprise Development (RUS).

Carrying out the analysis study as part of the Startup Connect project, we focus on the regions of Finland: South Savo, Kymenlaakso, South Karelia, as well as the regions of Russia within the Leningrad Region and St. Petersburg. Additional regions from which organizations can take part in the project in cooperation with the main ones are North Karelia, North Savo, Uusimaa, Päijät-Häme in Finland and the Republic of Karelia in Russia. As well as we will explore the large-scale entrepreneur and innovation events and support infrastructures elaborated and realized in Helsinki, as it is assumed they impact the cross-border region due to their international dimension, and openness and availability, for the participant both Finland and Russia. Also, we take the region of Moscow, as this area is included in the program area as major economic and cultural center²¹⁰. We will pay attention and highlight those initiative and measure of support to student technology entrepreneurship that have not been covered in the previous chapters.



^[209] The project is funded by the European Union, the Russian Federation and the Republic of Finland in the framework of South-East Finland-Russia CBC 2014-2020 Programme // <http://startupconnect.info/project>

^[210] https://www.sefrcbc.fi/wp-content/uploads/sites/6/2020/03/Programme-Manual-SEFR-CBC-2014-2020_Full-version-0.3_English.pdf

Russia

The entrepreneurship development is an important challenge for Russian economy in order to increase competitiveness as well as to ensure sustainable economic growth and development of the country. There is no emphasis on student entrepreneurship in the federal regulations, however, in the national project "Small and Medium Business and Support for Individual Entrepreneurial Initiatives", namely in the federal projects "Popularization of Entrepreneurship" and "Acceleration of Small and Medium-Sized Businesses", there are tasks for teaching entrepreneurship²¹¹.

According to RBC, the contribution of small and medium-sized enterprises (SMEs) to Russia's GDP is 20%. In the EU countries this figure reaches 67%, in China - 60%, in Japan - 55%, in the USA - 52%. By the end of 2024, according to the objectives of the national project "Small and Medium Enterprises and Support for Individual Entrepreneurial Initiatives", the contribution of SMEs to GDP should increase to 32.5%, and the number of people employed in the sector - up to 23 million people and up to 25 million people by 2030. Youth entrepreneurship can become a driver of the development of the SME sector in the medium and long term, experts say²¹².

Support Measures student & youth entrepreneurship at the national and regional levels

Case. Sprint UP Moscow, Russia²¹³

Sprint UP is an educational 5-day online course, the purpose of which is to teach students of Moscow universities and colleges entrepreneurial skills and competencies. Practicing business people will also teach students about business on the Sprint UP course. Current entrepreneurs, according to the head of the Department of Entrepreneurship and Innovative Development of the city of Moscow, Alexei Fursin, will help students plan the creation and conduct of their own business so as not to waste time on mistakes. Upon completion of the educational course, 15-20 of the most active participants will be able to present their ideas to experts and attract experienced entrepreneurs as mentors and partners.

In the format of lectures, master classes, round tables, completing assignments and discussing them, young people will receive the basic competencies necessary to create their own business.

In just the first two streams, there were enrolled more than 7,000 people from National University of Science and Technology «MISiS», Moscow Polytechnic University, RUDN, RSSU, RUT, MEPhI, Timiryazev Russian State University of Economics, Moscow Power Engineering Institute, MTUCI and other universities.

Case. All-Russian program for the development of entrepreneurship among youth Preaktum²¹⁴

Preaktum is an educational ecosystem that connects companies and young entrepreneurs. On its own educational platform, the team conducts interactive courses

[211] https://www.economy.gov.ru/material/directions/nacionalnyy_proekt_maloe_i_srednee_predprinimatelstvo_i_podderzhka_individualnoy_predprinimatelskoy_iniciativy/

[212] <https://plus.rbc.ru/news/5fbcc52f7a8aa93b6bf411e6>

[213] <https://sprint-up.ru/#about>

[214] <https://preaktum.ru/>

from leading experts from Russian and world companies. Topics: marketing, sales, programming, business models, economics and other knowledge that is in demand now and in the future. All community members get into the employer database and regularly receive job offers from really remarkable and advanced companies. For employers, candidates are selected and tested for those positions that require business thinking - product management, business development, marketing, development.

The Preactum Cup is an accelerator competition for students with their own projects, which has been running for 5 years. The goals of the participants are to get into a community of like-minded people, launch their own startup, improve their business skills and get advice from experts and mentors. Previously, the competition was held twice a year, but now every month. At the end of the month - the final, where you can win a grant of 25,000 rubles or more. The program was created on the initiative of the Rybakov Foundation.

Case. Educational platform for creative entrepreneurs The Masters²¹⁵

The Masters is a free educational online platform with lectures by existing entrepreneurs, telling about all stages of creating creative projects, as well as an online publication that daily writes about the most interesting local cases from the regions of Russia.

Courses on the intricacies of launching creative clusters, copyright coffee shops, bookstores, media and craft industries are complemented by numerous text and visual materials - news, analytics, interviews, analyzes, tips and tests.

The best students get the opportunity to hone their knowledge and skills in practice - within the framework of Russian and international internships and individual mentoring programs.

The Masters project is being implemented by the Creative Practices Foundation²¹⁶ with the support of the Native Towns social investment program of Gazprom Neft²¹⁷.

University contests for supporting student entrepreneurship in St. Petersburg

Case. HSE-SPb Student Entrepreneurship Initiatives Competition, St. Petersburg, Russia²¹⁸

The Higher School of Economics (HSE-SPb)²¹⁹ is an internationally ranked research university that carries out its mission through research-led academic, project, expert and socio-cultural activities based on international academic standards. Student Entrepreneurship Initiatives Competition is a project aimed at popularizing entrepreneurship among students of the Higher School of Economics - St. Petersburg and other universities in St. Petersburg. The competition is held to search for bright ideas and help their authors turn these ideas into business.

In a week, participants will have to overcome the path from idea to business model and go through a training program from our experts. The team can be from 1 person.

[215] <https://mastera.academy/o-proekte/>

[216] Foundation "Creative Practices" is engaged in the development of the creative environment of Russian cities// <http://cpractices.ru/>

[217] Gazprom Neft PJSC is an oil and gas company: exploration and development of oil and gas fields, oil refining, production and sales of petroleum products// <https://www.gazprom-neft.com/>

[218] <https://spb.hse.ru/cia/contests>

[219] <https://spb.hse.ru/en/>

The competition consists of four stages:

Stage 1. Submission of an application for the competition in the form.

Stage 2. Conducting master classes.

Stage 3. Preliminary selection.

Stage 4. Presentation of projects.

Case. Competition "Start-up SPbSU", St. Petersburg, Russia²²⁰

The winners of the competition will receive a million rubles and will be able to defend their idea as a final qualifying work. For young businessmen, this is a chance to assemble a team, test their idea for strength and receive funding for its implementation. Another nice bonus is the ability to defend your project instead of Final qualifying work. This means that entrepreneurs can devote even more time to realizing their vision.

The competition project can be devoted to artificial intelligence, blockchain technologies, bioinformatics, processing of solid and liquid household waste, medical technologies, cross-border logistics "The Great Silk Road", new energy and much more. Participants who choose one of the proposed topics may be able to get to the international stage of the competition. However, the organizers are ready to consider those projects that go beyond the specified areas.

The teams with the most knowledge-intensive and commercially promising business models will receive cash prizes. The first place will bring the winners 300,000 rubles, the second - 200,000 rubles, and the third - 100,000 rubles. When summing up the results of the competition, the two winning teams may be invited to create, together with the University, small innovative enterprises. Grants for their development will amount to 1,000,000 and 700,000 rubles, which will be distributed depending on the number of points earned.

Scientific supervisors can also take part in the competition. If their pupils take one of the three prizes, teachers will receive bonuses in the amount of 100,000 rubles. Note that each team can submit only one business project. One can only participate in the competition as part of one team.

Case. The Blue Ocean Open Polytech Entrepreneurship Competition, Peter the Great St. Petersburg Polytechnic University (SPbPU)²²¹

The organizers of the competition are the Vice-Rector for Youth Affairs of SPbPU, the Russian-German Center for Innovation and Entrepreneurship "Polytech Strascheg" and the Graduate School of Technological Entrepreneurship of the Institute of Advanced Manufacturing Technologies (HSTP IPPT) of SPbPU²²². The purpose of the competition is to stimulate students to entrepreneurial and research activities, as well as prepare them to participate in the international competition for entrepreneurial ideas The Blue Ocean High School Entrepreneurship Competition. Students and graduate students from any universities in Russia who have their own start-up, entrepreneurial know-how, or a desire to learn how to generate innovative ideas can participate in it. During the competition, participants will get acquainted with the Blue Ocean Strategy - a strategy for creating

^[220] <https://spbu.ru/news-events/novosti/luchshiy-startap-studentov-spbgu-smozhet-vyigrat-bolshe-milliona-rubley>

^[221] Peter the Great St. Petersburg Polytechnic University is one of the major school of higher technical education in Russia. <https://english.spbstu.ru/university/>

^[222] https://www.spbstu.ru/media/announcements/competitions_grants/blue-ocean-open-polytech-entrepreneurship-competition/

innovative and free of competition startups. They will use it to develop their own blue ocean strategy and present it to entrepreneurship experts.

The winners are selected according to the sum of the maximum points for the three stages of the competition. Cash prizes are paid to the three winning teams. For 1st place each team member will receive 15,000 rubles, for 2nd place - 10,000 rubles, for 3rd place - 5,000 rubles.

For the second stage, the partner companies of the competition will offer 2-3 cases to choose from. Students will have to find an innovative solution to a problem - for this they will have to apply the blue ocean strategy. The teams that present the best solutions, according to the jury and company representatives, will be awarded special prizes. All participants of the competition will be awarded certificates on behalf of the Russian-German Center for Innovation and Entrepreneurship "Polytech Strasczeg", and the winners - diplomas of 1, 2 and 3 degrees. All participants of the competition will be awarded certificates on behalf of the Russian-German Center for Innovation and Entrepreneurship "Polytech Strasczeg", and the winners - diplomas of 1, 2 and 3 degrees. Students who won prizes following the results of three stages will receive an additional 5 points for admission to the Master's program "Technological Entrepreneurship" at DYING IPPT SPbPU. After the competition, students can submit their projects to the international competition The Blue Ocean High School Entrepreneurship Competition (prize fund over \$ 3,000). After confirmation of participation in this competition, they receive 5 additional points for admission to the Master's program "Technology Leadership and Entrepreneurship" (International Educational Program). Upon request, SPbPU students will receive personal consultations with project feedback. With students from other universities, consultations are conducted online.

Case. Xlab as a community, coworking space and prototyping facilities, ITMO Univesity, St.Petersburg

XLab²²³ is a community that unites students, experts, entrepreneurs, developers, mentors, teachers, a coworking space and an advanced laboratory for developing prototypes.

Xlab (The Experimental Laboratory) was created as part of the international Twin Campus project²²⁴. Organized by Cursor Oy and Xamk University the laboratory of the same name operates in Kotka at the South-Eastern Finland University of Applied Sciences (XAMK). The two laboratories are expected to work together: share experiences and hold joint events. Its academic partners are ITMO University and XAMK (Finland, Kotka), while among project partners are Cursor Oy (Kotka, Finland), St. Petersburg's Industry Development Fund, and Ingria Business Incubator (Russia, St. Petersburg). The Twin Campus project aims to build an effective model of cooperation between universities and industry with a view to foster the development of high-tech business and attract them to both countries. ITMO University pays special attention to students' tech ideas that can make their way to market launch, and we're looking for ways to help our students bring their innovative projects and ideas to market. Creation Xlab where students could work on their prototypes and build their MVPs by, among other things, using complex and expensive equipment contributes into the TWIN Campus project and

[223] <http://xlab.technopark.itmo.ru/eng>

[224] Twin Campus project is funded by the European Union, and Russia and Finland within the South-East Finland - Russia Cross-Border Cooperation Program.// <http://www.twincampus.info/>

complies with the university ambitions and policy. XLab hosts various thematic events: lectures, hackathons, and championships. Due to the collective events with business, industry representatives, entrepreneurs, startups XLab facilitates developing entrepreneurial mindset of students; provides equipment for work in the field of IT, robotics, and virtual and augmented reality. The ultimate goal of XLab is to bring together students involved in tech projects, as well as introduce them to each other and industry representatives. XLab has now become an attraction point for several student clubs, namely, Info Lab, GreenTech.Students, the newly established Energy Club, and many others. This was made to let clubs share their best practices, build up interdisciplinary teams, and create projects on the basis of different technologies. XLab also actively holds educational events and meetings with business representatives and industrial partners. The laboratory is open to all ideas and projects related to IT technologies. It allows students to try their hand at new projects and experience cutting-edge technologies.

Case. Student Business Incubator of the University of Petrozavodsk (PetrSU)²²⁵

The student business incubator of PetrSU was created to support innovative activities, as well as the comprehensive development of students. It forms a convenient and diverse platform for the practical implementation of innovative projects by students and graduate students. At least 15 educational programs for students and entrepreneurs are held annually in the Student Business Incubator contests and events. in educational programs in which more than 400 people take part.

The student business incubator of PetrSU realize the projects and educational programs:

- "Mobile Business Incubator" is a project of PetrSU aimed at supporting small and medium-sized businesses, informing self-employed citizens, as well as introducing new measures to support business.
- Trainings, webinars and educational programs for aspiring entrepreneurs.
- Information technology in project management - training in the use of IT in entrepreneurship and project management.
- Refresher courses for entrepreneurs in the field of business planning, marketing, project management.
- Informing about measures of state support for entrepreneurs.
- Programs of additional education for students ("Fundamentals of Entrepreneurship", "Fundamentals of Project Activity", "English in the Field of Business Communication", "Fundamentals of the Development of Estimated and Production Documentation Using the Software Estimate and Analytical Complex" AO ", Fundamentals of Game Development for PC using the Unity3 game engine ", " Finnish in Business ", etc.).
- "Interfaculty group of PetrSU" is a new model of teaching students together with the authorities of the Republic of Karelia, public organizations, representatives of business structures and NGOs in order to form a team of young specialists for the implementation of projects aimed at the development of the republic.
- Schools of Entrepreneurship and Invention offers trainings and master classes from business representatives, specialists in management, marketing and economics.
- Summer student expeditions in order to study the historical and cultural potential of the sights of Karelia in the context of the development of educational tourism.

^[225] <https://petrsu.ru/structure/396/studentcheskijbiznes#t20c>

- Trainings and master classes for schoolchildren on the basics of entrepreneurship and project activities.

Student Business Incubator created the Resource Center for Scientific and Technical Creativity of Students – one of the first centers in Russia to support the development of the engineering and technical component in the additional education of schoolchildren and students. With the support of Student Business Incubator, small innovative enterprises that are among the top 100 enterprises in Russia are developing. With the assistance of Student Business Incubator, PetrSU won a federal project to create an Engineering Center – a unique platform for training engineering personnel and innovative technological solutions in the forestry, agricultural and transport sectors of the economy. The Student Business Incubator project "Mobile Business Incubator" is a unique practice in the Republic of Karelia, implemented by PetrSU to reduce the administrative burden on small and medium-sized enterprises.

North-West Center for Technology Transfer FIOP RUSNANO²²⁶

The North-West Technology Transfer Center was established in 2012 by the Fund for Infrastructure and Educational Programs, the Government of the Leningrad Region and Project Nanotechnological Center LLC with the aim of structuring and commercializing innovative projects in the field of nanotechnology in the start-up format. Nanotechnology Center is a new type of infrastructure organizations providing a full cycle of services for the successful launch and development of startups in the field of nanotechnology. More than 10 nanocenters operate in different regions of Russia.

Within the framework of the main activities of North-West Center for Technology Transfer (nanoelectronics, nanomaterials and radiation technologies), monitoring and selection of scientific developments for the formation of projects, start-up companies by attracting organizational and financial resources of the Northwest Technology Transfer Center. Also, North-West Center for Technology Transfer provides management consulting for projects (development and implementation of development strategies, optimization of business processes), and provides services in the field of educational activities. The center's activities are not focused on student entrepreneurship, but any founders, engineers and inventors in the field of nanotechnology can cooperate with the center.

Finland

As it is said on Finland Toolbox²²⁷, the Northern Region is the fastest growing startup region in Europe and one of the fastest growing globally. In the last decade, a strong foundation has been created in Finland to support start-ups, and there is an upward trend in entrepreneurial activity. It is also generating interest from international private investors and global corporations looking for new business opportunities and talented teams to collaborate.

Finland offers startups an open and comfortable business environment in which creative entrepreneurs support each other. Helsinki is considered the hub of startups in Northern Europe, especially in November during The Slush startup investor conference, which is held annually in Helsinki. This is a great place to experience the unique Finnish style of entrepreneurship. Over the years, Slush has evolved from a 300-person meetup into a full-fledged startup festival that gathers 20,000 people from over 100 countries.

^[226] <http://nwttc.ru/o-nanocentre/istoriya/>

^[227] <https://toolbox.finland.fi/business-innovation/finland-startup-hub/>

The first startups in Finland appeared in the early 1990s. The so-called dot-com bubble can be seen as the endpoint of the first wave of Finnish startups in early 2000, but after a couple of years the situation began to recover. The rise of the massive student movement behind the Slush conference began at the end of the first decade of the millennium. This period also saw a general rise in entrepreneurship. There are hundreds of startups in Finland now operating in a wide variety of industries.

One of the growth engines of the Finnish startup industry has been the hugely successful gaming industry. Today, the business areas of startups are diversified: from games, software and digital services to the Internet of Things (IoT), healthcare technologies, environmental protection and energy.

The Finnish government provides funding and services for early stage innovative companies and encourages and supports universities to commercialize their ideas. For example, Business Finland, the Finnish Innovation Financing Agency, offers well thought out financing services for companies at different stages of their business development. Startups can apply for a small grant to study the needs of customers and markets, as well as follow-up funding for research and development and business expansion. The government shares the risks with entrepreneurs and private investors.

Characteristics of the start-up industry in Finland:

- A well-functioning business environment supported by state-of-the-art research and development facilities.
- World renowned education system; school in Finland is free up to higher education, education encourages creative thinking, problem solving and collaboration skills.
- Lots of incubators and accelerators for startups from different sectors
- Strong talent pool of experienced ICT and software professionals.
- Government funding and start-up support services.
- A growing number of Finnish and international venture capitalists investing in Finnish startups.
- Conference of startups and investors Slush - the best platform for startups in Scandinavia.
- High standard of living and quality of life with government services that maintain work-life balance.
- An entrepreneurial culture in which startups support each other and share knowledge.

The Finnish educational technology ecosystem has developed rapidly over the past 5 years and now includes all the necessary ecosystem participants and provides services at all stages of the educational technology launch process. It includes an accelerator, a venture capital fund, an industry organization, events and communities specializing in educational technology. The government supports the sector through the national Education in Finland program and various projects such as Smart Learning Environment for the Future. Starting in spring 2021 in Helsinki, edtech developers will gather at the Helsinki Education Hub.

A strong ecosystem brings results: Finland is the country with the most education technology startups (14 out of 50) in the Top 50 in the Nordic and Baltic States, although it is not the largest in the region. This speaks volumes about the quality and power of

[226] <http://nwttc.ru/o-nanocentre/istoriya/>

[227] <https://toolbox.finland.fi/business-innovation/finland-startup-hub/>

Finnish educational innovation.

A good startup ecosystem is a prerequisite for a successful educational ecosystem. Helsinki ranks 4th in the ranking of the best growing startup ecosystems in the world (according to Startup Genome). It hosts Slush, the largest startup event in Europe, the Maria01 startup center with over 1,000 attendees, Europe's largest business angel network, and many accelerators, incubators and venture capital funds. The Finnish startup scene is known for its amazing sense of community: in the Global Startup Ecosystem, Helsinki was ranked first in terms of local connectivity (= sense of community). Helsinki attracts highly skilled technicians thanks to the global success of ICT companies such as Nokia. Low hierarchy, startup culture, excellent English proficiency and international talent make the startup ecosystem dynamic and empowering.

Case. Helsinki Business Hub²²⁸

Helsinki Business Hub is an agency for promoting international trade through Finland and providing investment for entrepreneurs in the Finnish capital, which helps foreign companies to set up, grow and develop in Helsinki. They focused on the following areas (but not limited to):

- Information and communication technology, with special focus on software development, industrial internet, and digital infrastructure
- Health, with special focus on personalized health & med tech
- Smart & clean technologies, with special focus on smart buildings and smart mobility
- Hotel investments

The agency will help entrepreneurs in their activities in Finland and its capital region - from the idea of creating and expanding a business. They help if the business needs: a better location, cooperation with Finnish companies, the flow of deals from Finland or the possibilities for expansion in Helsinki. The agency accompanies startups with information and contacts.

The Helsinki Business Hub helps you navigate Helsinki's educational technology. The team is ready to help whether you are looking to expand your business, looking for investment, business or research and development opportunities. All services of the Agency are free of charge.

Case. Kymenlaakso Startup Ecosystem²²⁹

The project aims to map the current state of the Kymenlaakso startup ecosystem, formulate proposals for its improvement, formulate approaches to assessment, conduct experiments with students' participating, entrepreneurs and the community to develop the startup ecosystem, as well as participate in socio-cultural activities to empower students, pupils and entrepreneurs to make startup culture a part of their daily lives for people of different ages and life stages.

Project activities are divided into three work packages: Environment, Experiments, and Community.

^[228] <https://www.helsinkibusinesshub.fi/>

^[229] <https://www.xamk.fi/en/research-and-development/kymenlaakso-startup-ecosystem/>

Environment	The environment work package is key to the Kymenlaakso startup ecosystem. Based on the mapping, proposals are made for its improvement, including proposals for assessing the development of the regional startup ecosystem. The map uses existing data on the Kymenlaakso startup ecosystem, benchmarking and interviews with key stakeholders. The results of this work package are visualized for use in internal and external communications of the region.
Experiments	Experiments work package is all about experimentation in its broadest sense - events, projects run by students, entrepreneurs, and the community that involve events, communication, and collaboration between different actors to enrich the startup community. Experiments focus on improving interactions between ecosystem participants and activities (e.g., services, events, projects, organizations) and raising awareness of existing services.
Community	The Community Development Package supports the Experiment work package, but also independently facilitates the participation and contributions of the wide student community of Kymenlaakso in building a regional startup ecosystem. Activities include strengthening collaboration between the PatteriES student entrepreneurial community and vocational schools, high schools and other interested organizations.
All work packages support the growth and development of SHIP - a startup festival. Moreover, the events improve the planning and implementation of the new campus and event arena in Kotka, as well as the use of design, project and coworking spaces in the Kouvola region as an open environment for innovation and new business creation.	

Case. Aalto University Comprehensive Services²³⁰

SLUSH²³¹

Slush is a student-driven, non-profit movement originally founded to change attitudes toward entrepreneurship. The international forum for startups and high-tech companies Slush Helsinki is the largest startup event in Northern Europe. In 2008, SLUSH started as a small event with 300 participants.

SLUSH today is:

- more than 2600 startups
- more than 6000 meetings
- 20,000 participants

^[230] <https://aaltopreneur.fi/startupsupport/>

^[231] <https://www.slush.org/>

- 1500 investors
- 600 journalists

SLUSH takes place in Helsinki, Shanghai, Singapore, Tokyo. Several successful entrepreneurs such as Niklas Zennström (Skype & Atomico), Taizo Son (GungHo), Ilkka Paananen (Supercell) and Risto Siilasmaa (Nokia), among others, have already become part of a non-profit initiative that is radically changing the perception of entrepreneurship in Northern Europe. Japan and China.

The 2018 event brought together 3.1 thousand startups from all over the world and 1.8 thousand investors, including Russian mentors and businessmen. This is 546 startups and 300 investors more than last year. Among the participants with a global brand on Slush, Facebook, Paypal, Slack, PWC, Microsoft, Porsche, Oracle were seen.

The gathering of 25,000 curious minds, including 3,500 startups and 2,000 investors, took place in 2019.

The event is aimed at growing companies at all stages and from all industries.

Objectives of participation:

- Find partners and establish new contacts
- Find an investor
- Submit your business idea
- Learn about trends in the development of high-tech industries

Speaking of Slush this year, it is necessary to mention not only the main event, but also the many side events and side events.

Slush in Northern Europe goes beyond its main two-day event, with hundreds of official and unofficial side events taking place before and at the same time throughout Helsinki. In 2018, official events focus on exciting areas such as construction, education and healthcare.

Ranging from pitching competitions to bar tours, with hundreds of parallel and Slush events, everyone is guaranteed to find something fun for themselves. The SLUSH program includes bright presentations of projects and products, exciting speeches, meetings with investors, trainings with leading entrepreneurs.

The Skolkovo Foundation, which in recent years has been a permanent participant of the forum, in 2017 exhibited the developments of 17 of its companies at a joint stand with Russian export center under the motto Made in Russia.

Slush members represent a variety of industries: biomed, IT, cyber defense, energy, telecommunications, and robotics. For example, Navigine develops solutions for indoor navigation, and Texel, using a 3D scanner, provides a virtual fitting room, in 2017 Texel brought a new solution - an advanced digital platform that automatically recognizes a person's posture, which can be applied in many industries. Another company - Samokat Sharing - has launched a pilot project for the rental of scooters in Finland, in the city of Espoo.

Speaking about the entrepreneurial support system in Finland for development technological business and especially startups launches by youngsters it is worth mentioning:

■ Wave Ventures²³²

Founded in 2016, Wave Ventures is a venture capital investment firm headquartered in Helsinki, Finland with a regional office located in Sweden. Wave Ventures focuses on pre-seed investments in Nordic startups. They wish to invest in the most audacious founders emerging from the Finnish and Nordic startup ecosystems. Startups seeking an investment should have global ambitions and the next tech-enabled, breakthrough idea.

■ Business Finland

Directed by the Finnish Ministry of Employment and the Economy Business Finland is the public organization for innovation funding and trade, travel and investment promotion in Finland. Business Finland is a new organization, formed through the merger of Tekes and Finpro and creates new growth by supporting companies to go global, as well as funding innovations. It offers funding for innovation activities and services for internationalization,

■ Aalto Startup Center²³³

Aalto Startup Center also has specialist funding advisors. Aalto Startup Center is a hybrid accelerator participating and leading international incubator and accelerator programs. In 2020 over 40 companies in its programs were served, and in 2019/20 Aalto Startup was ranked as World Top 5 University Business Accelerator by UBI. Aalto Startup Center's network can facilitate and support ideas through research, contacts, know-how, and funding. This network cycle enables its collaborators to grow, develop, sell products, and thus create jobs, tax revenues, and ultimately economic growth on a national level. Hence, the network is later replenished with ideas and know-how of its own. Aalto Startup Center also runs the European Space Agency's (ESA) Business Incubation Centre in Finland. It was founded in 2017 to support aspiring innovative entrepreneurs and young ambitious startups financially and technically to reveal their full space potential.

ESA BIC Finland is part of the wide European ESA-BIC network. ESA BIC is the European Space Agency's (ESA) Business Incubation Centre in Finland. It welcomes ideas and business models proposing New Space solutions and technologies from positioning and navigation to communications, robotics, nano-satellites, Augmented Reality, autonomous driving, self-navigating and self-flying devices, ships and vehicles, novel materials, Artificial Intelligence, innovations specifically for arctic conditions, gaming, just to mention a few.

■ Aalto EIT Services²³⁴

European Institute of Innovation & Technology (EIT) supports the development of dynamic pan-European partnerships between leading universities, research labs and companies to develop innovative products and services, start new companies, and train a new generation of entrepreneurs. These partnerships are known as EIT Knowledge and Innovation Communities (KIC). The KICs main goal it to bring ideas to market, turn students into entrepreneurs and enable world-class innovation.

Aalto EIT Services connect Aalto students to the European network of EIT Community bringing together more than a 1000 partners from companies, higher education institutions, research organisations and from cities and regions. Aalto EIT Services supports students during any phase of the EIT Activities so one can be part of the

^[232] <https://wave.ventures/>

^[233] <https://startupcenter.aalto.fi/about-us/>

^[234] <https://www.aalto.fi/en/aalto-eit-services/european-institute-of-innovation-technology-eit>

movement that enable innovation and create the tomorrow's entrepreneurs.

Both the EIT-KICs teams and the ESA BIC Finland program at Aalto help prospective entrepreneurs and technology commercializers with access to funding.

■ Enterprise Espoo²³⁵

The business support organization that aids on free of charge base with matters related to entrepreneurship. It helps with funding and practical company formation and registration advice.

Case. Joint project between Russia and Finland – Startup Connect Contest for startups from Finland and Russia²³⁶

Within the project the STARTUP CONNECT²³⁷ to support start-up entrepreneurship and SME cooperation and enable them to succeed globally the Contest focused on the companies and development teams from Finland and Russia who created solutions in the areas of robotics, logistics, IoT, Industry 4.0, smart mobility and others can take part in the competition.

The winner received:

- an invitation to the LevelUp accelerator²³⁸ at Kotka
- the possibility to launch pilots with Finnish companies
- participation package with a booth at the Web Summit 2019 conference in Lisbon

The Startup Connect Contest final took place at the Startup Festival *Ship in Kotka (Finland) on August 1-2, 2019. During the festival 10 best projects present themselves to European investors, take part in mentor sessions and compete for a prize of 5,000 euros. In addition, *Ship is an opportunity to meet and have a great time with entrepreneurs from different countries in an informal setting: riding a boat, swimming in the lake and just walking around the summer Kotka. For the finalists of Startup Connect Contest, a transfer from St. Petersburg was organized, the expenditures for accommodation was covered, a business and cultural program was organized.

Thus, the border region of Russia and Finland is a fertile ground for the development of student entrepreneurship.

Outcomes on the pilot survey on Students Technology Entrepreneurship

As part of the preparation of this analysis we conducted a pilot survey of students about entrepreneurial projects during their studies. We gathered 52 answers from Russia, Finland, Latvia, Lithuania and Germany.

The purpose of this block of work was to outline the general trends of student entrepreneurship, which were further covered in more detail in this report through case studies and analysis of best practices. In addition, the pilot survey allows us to get an opinion on student entrepreneurship and startups on first-hand base – the students themselves, who are the target audience for entrepreneurship support services.

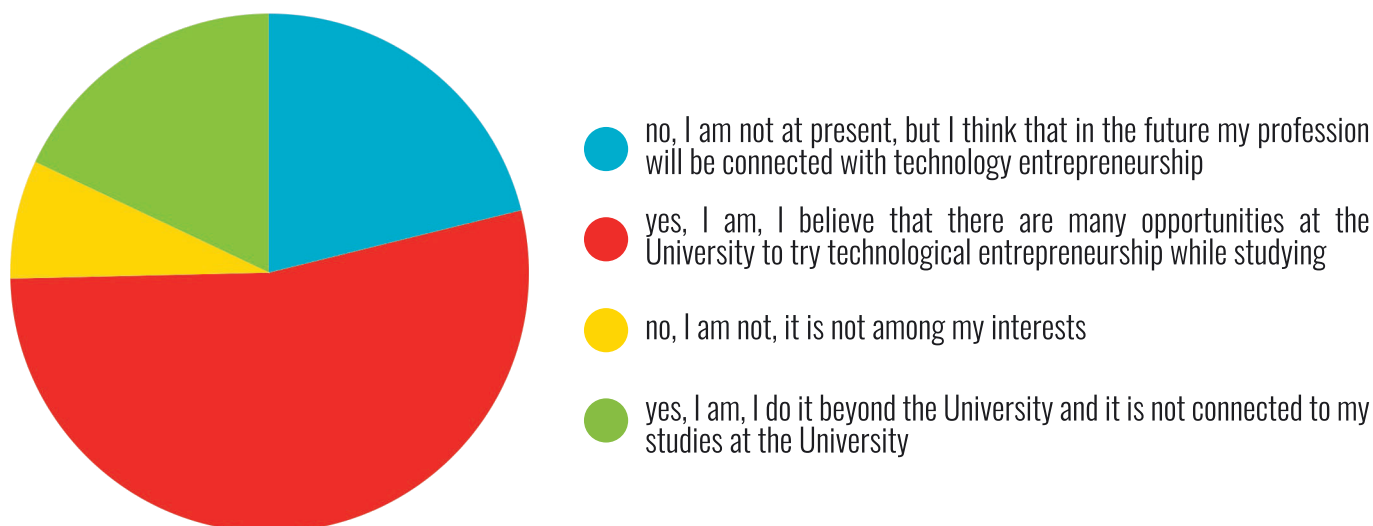
^[235] <https://www.yritysespoo.fi/en/>

^[236] <http://startupconnect.info/news/18-startup-connect-contest-for-startups-from-finland-and-russia>

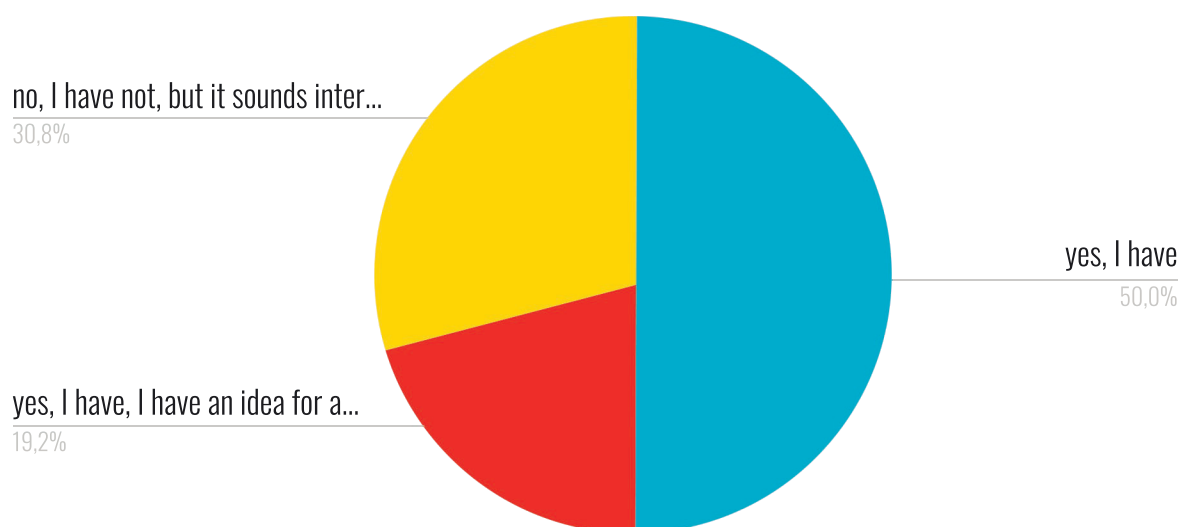
^[237] The project is funded by the European Union, the Russian Federation and the Republic of Finland in the framework of South-East Finland-Russia CBC 2014-2020 Programme // <http://startupconnect.info/project>

^[238] <https://www.f6s.com/levelupstartupaccelerator>

Are you interested in technological entrepreneurship?

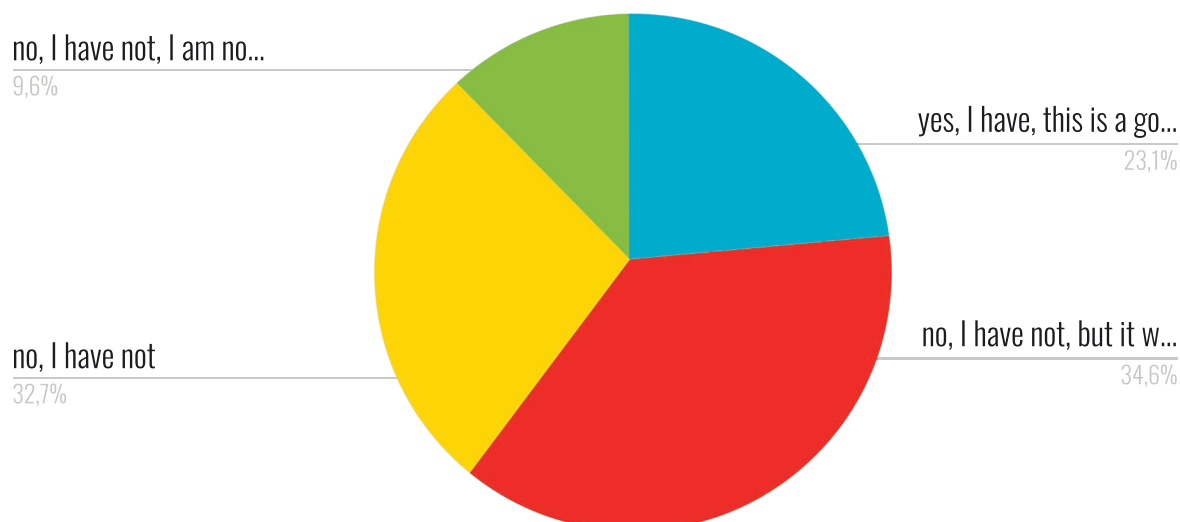


Do you have experience in technological entrepreneurship?



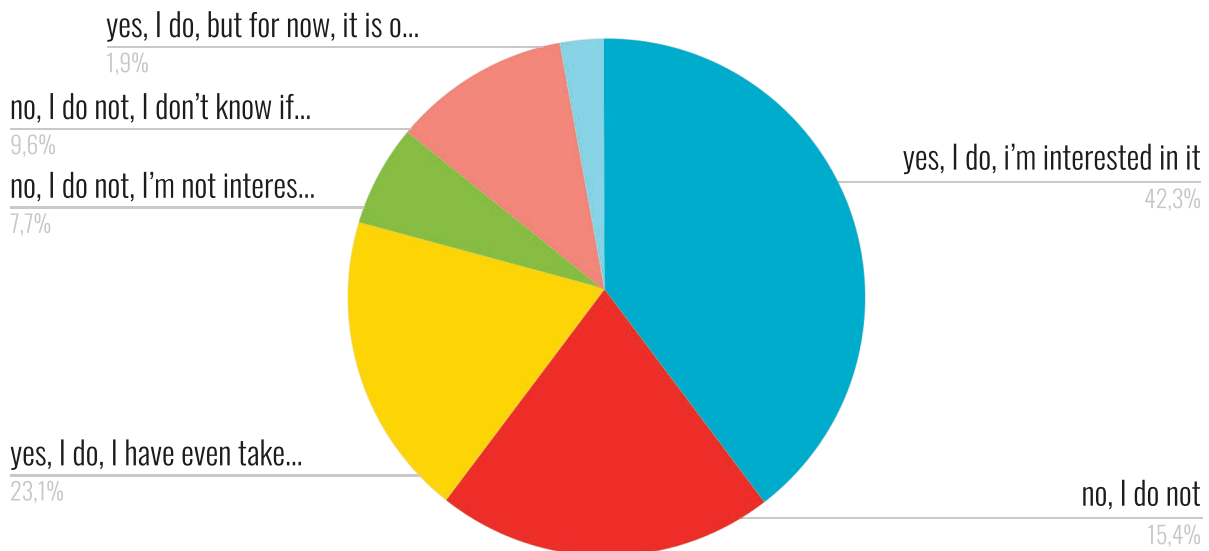
Most of the respondents rated their entrepreneurial experience 3-4 on a 5-point scale, but almost 1/5 rated this experience very low - from 0 to 2, and only one person from the University of Turku noted that the experience can be assessed at the maximum point.

Have you participated in accelerator/pre-accelerator with a project?



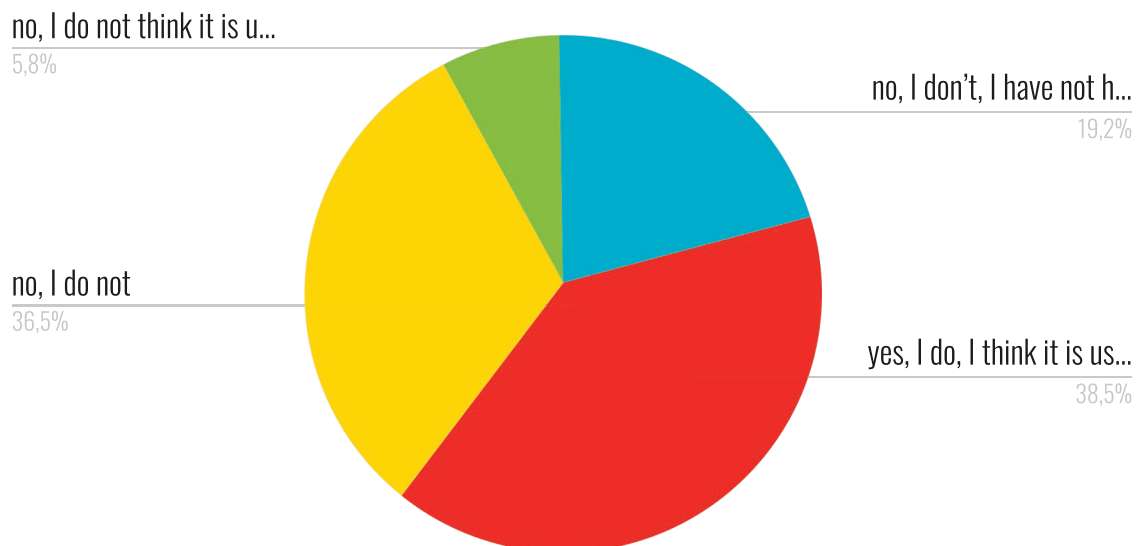
One respondent noted that he was in the accelerator in the first semester of the first year. It was a bad experience, there is nothing to do without competencies or ideas.

Do you participate in activities that promote entrepreneurial thinking (for example, lectures or seminars from business experts, summer schools, etc.)?

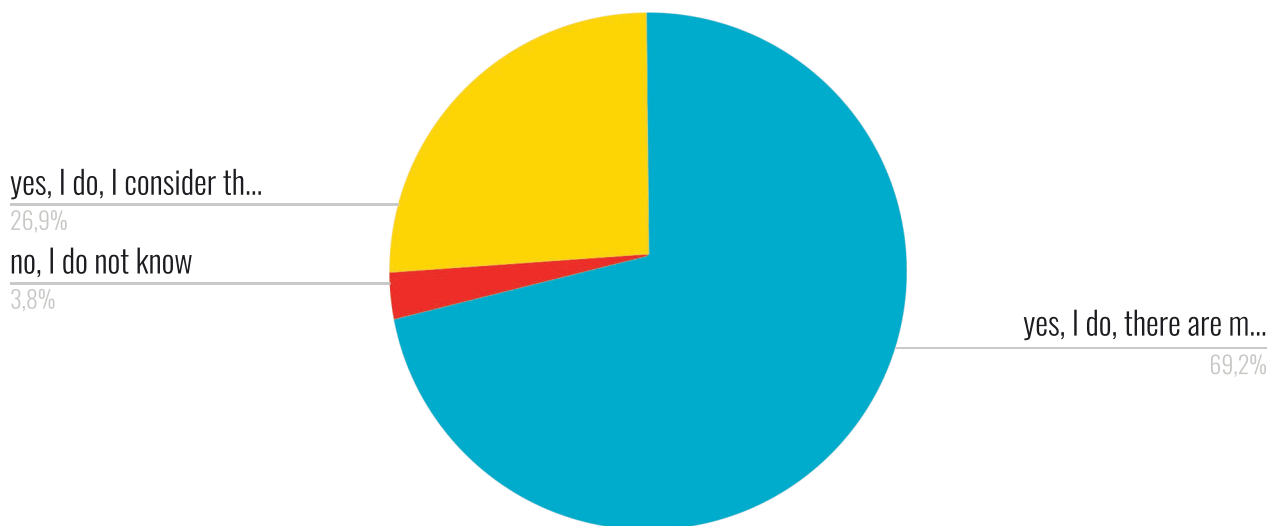


Most of the respondents rated their participation in entrepreneurial activities at 4 points. Lots of maximum rates were from students from Kaunas University of Technology, also some students from ITMO University and Higher School of Economics from Russia rated their experience at 5.

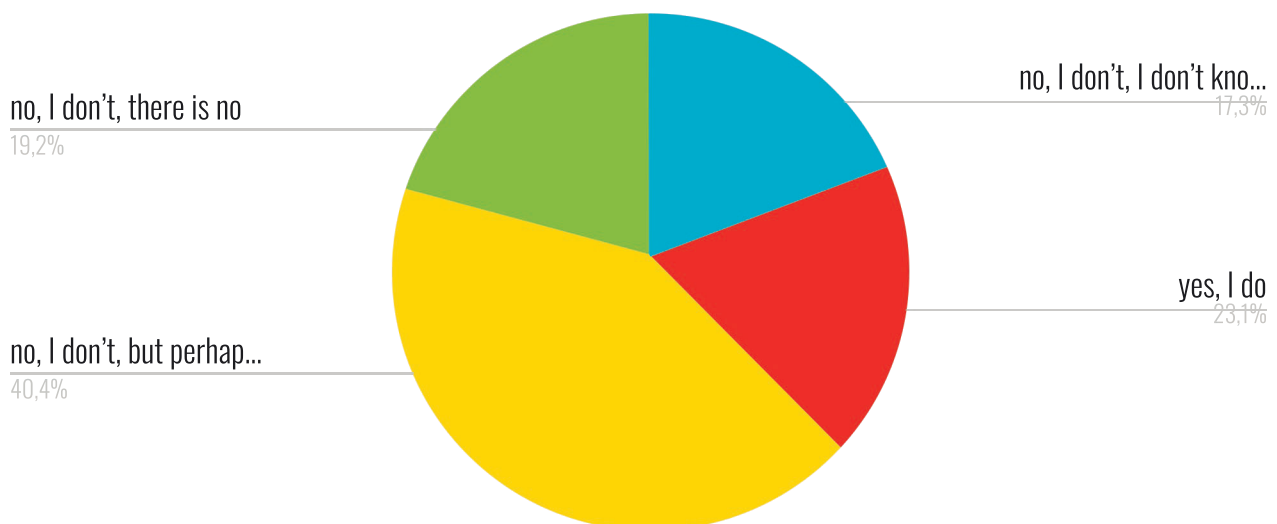
Have you ever participated in student entrepreneurial initiatives/clubs?



Do you think the University (where you study) has the infrastructure and technical capabilities to develop technology entrepreneurship and/or startups?



Do you use prototyping centers, manufacturing laboratories, engineering centers at the university, if necessary?



With regard to the assessment of the quality of entrepreneurial services and opportunities at the university where the respondents study, the answers were mostly positive. Most of the ratings were 4 or 5 out of 5 possible.

Chapter 4.

Recommendations in the field of support and development of technological entrepreneurship among students in the perspective of economic growth and international cooperation between Russia and Finland

The border region of Russia and Finland is a fertile ground for the development of student entrepreneurship, with sufficient infrastructure, strong and active universities, a series of regular events that form a close-knit and vibrant community. It is recommended to focus on solving local problems of specific university communities by local student entrepreneurs, as well as focusing on major sectoral problems and major socio-economic challenges.

There are a number of management approaches to student entrepreneurship development. Among them are approaches that focus on the formation of the university ecosystem, others focus on the educational and methodological process, and still others on the revitalization of the regional ecosystem of entrepreneurship through specialized events. Each approach has limitations and advantages, but the key advantage and recommendation is to combine different approaches depending on the current strategic objectives.

Infrastructure support for student entrepreneurship is part of what can be called the university ecosystem approach, but often it is also closely related to specialized entrepreneurial education. Infrastructures such as laboratories, shared centers, makerspaces, hackerspaces, and even just coworking spaces help student entrepreneurs gain access to expensive development and experimental production tools, as well as gain experience in teamwork, networking, and mentoring.

The more such forms of support are developed and spread, the more the cycle of product development, testing and launching a startup to the market becomes cheaper, therefore it is recommended to expand the network of development infrastructures for student startups at all levels from local university and municipal, to regional and international.

Infrastructure investments for innovation, cooperation of universities and companies in R&D, legal protection of intellectual property, willingness of firms to finance research activity consist the favorable climate for the student entrepreneurship development and require further active development.

The most interesting ideas from support measures highlighted in the analysis can be taken as a basement to make recommendations.

National and Regional Level

- to elaborate grants, support programs focused on student entrepreneurship development

- social benefits from government for student-entrepreneurs (like in France case). To cope with unemployment France built centers PÉPITE, entrepreneurship educational programs in universities and student-entrepreneur status
- informative support at the national level (including, guides and checklists of starting own business. For example, one-page guidance and resources for student entrepreneurs in Netherlands)
- include students into the regional entrepreneurial ecosystems via inspiring them by the experience of prominent entrepreneurs, networking, getting expert support (cover the expenditures for expertise, like in Ghent case (Belgium), where within local innovation support system a student can receive virtual wallet “money” from which can be used for consults with local entrepreneurs, mentors, conference tickets, the activities that helps a student to develop business.
- regional cross-border collaborative projects with participating organizations on Triple Helix principle (Academia-Business-Government) facilitate entrepreneurship development via formulating proposals for its improvement, conducting experiments in with students’ participating in technological entrepreneurship, creating community of entrepreneurs, socio-cultural activities to empower students.

University context

- to create entrepreneurial climate due to designing strategy having inspiration events, educational programs, entrepreneurial events, student clubs, co-workings, maker places, accelerators, incubators, etc.
- to support teachers and faculty who are going to start or run their business, the experience of teachers inspires students to choice entrepreneurial career, reduce level of fear to start business
- to engage first-year bachelors into university entrepreneurial activities both formal and informal formal (show them the university's entrepreneurship support services, organize excursions to fab labs, technology parks, etc.)
- to promote launching and to support student organizations as sources for knowledge and practice, networking, acquiring “soft” skills, advancing professional skills and competencies
- to assist student initiatives like organizing and running start-up festivals, contest schools in collaboration with business (ex, *ship, Slush)
- to launch joint activities with universities-partners located nearby to unite and complete expertise and knowledge (ex, LUT&LAB, MIT&Harvard)
- to offer student (for those who do not have compulsory entrepreneurial course) elective and short-term entrepreneurial course with practice and applying practical knowledge
- to create places like hackspace and makerspace that unites where people with similar interests (scientific, technological, in digital or electronic art, communication and joint creativity)
- collaboration with industry partners (partner program, joint incubators or with strong involvement industrial partners, special offer for incubating students’ projects)

The list of proposals formulated by the survey participants to the question "What do you think is missing at the university (where you study) for the development of technological entrepreneurship and / or startups (possibly technical capabilities, etc.)?"

- Systems for the selection of teams, examples of collaboration between entrepreneurs and scientists, an open system of mentoring, mentors in legal and financial issues, and most importantly - successful examples of startups organized by students, teachers, scientists
- Clubs, lectures, free access to well-known paid courses
- Strong specialists and mentors
- Initiatives of students
- Prototyping, excursions to laboratories
- PR companies
- Illumination of this topic
- Outputs to potential customers, a machine for creating prints on clothes
- Most often I find out late about ongoing events
- Opportunities to combine with studies
- Communication with recruitment in projects related to entrepreneurship. Perhaps students mistrust each other
- Motivating people
- General awareness
- Start/up funding
- Clear path to follow
- Relevant equipment
- It would be great if there were more clubs or conferences about starting and managing companies and start up's
- I think there are sites where we can engage in project development, but there should be a bit more of them and with a wider variety of science fields
- More innovative specialists who are interested in sharing their knowledge
- I think universities could give students more information about technological entrepreneurship so we better understand the advantages of it
- Funding
- Group work spaces
- Better and earlier education about these opportunities
- New computers
- I think that my university has everything you need, just you have to know what you are looking for
- More people with experience, prototyping center
- Money
- Nothing really, perhaps teachers who have experience about entrepreneurship
- The visual support from the head of the faculty
- Greatly because of COVID I think, but I don't feel (yet) compelled to engage with the few activities that are offered

The list of recommendations given by the student-respondents of the questionnaire to the question "What services, infrastructure, technical capabilities provided by the university would you like to have access to?":

- IT
- VR
- Expert advice (on topics: technology, grants, investments, partnerships, team involvement)
- Networking
- Metalworking, expert advice
- Access to laboratories
- Funding, free online courses
- 3d printer
- Free IT prototyping and consulting
- Servers, software licenses
- High-power computers, professionals in certain fields, as well as laboratories
- Prototyping laboratory, workshops
- Financial services
- Tools, equipment, facilities to do
- Augmented learning
- Various laboratories, equipment etc.
- As a software developer I can't think of any technical capacities, services that I would need, as there is not much of a need for me personally
- More lectures about technological entrepreneurship and start-ups
- Robotics lab, 3D printing
- More individual laboratory work (after lectures)
- Prototype lab
- I think it is important to have more discussion options available also outside of the lectures, without me feeling guilty disturbing the teachers
- I don't need access in anything but if I needed, some counseling would be nice
- Work practices in startups or workshops with the CEO of startups
- 3D printers and get to know them mainly, to get the idea juices flowing
- Offices, Maker space, design lab

Also, many of the respondents noted that they already have access to everything they need and there is only a need for training and mentoring.

Conclusion

The conception of entrepreneurship as a certain personality structure, a set of human characteristics, a system of his views and a way of thinking, to a greater extent than a set of competencies was changed by the awareness that entrepreneurship can be taught but not as a process but a method. The new generation of student entrepreneurs are driven by the potential to change the world for better. Student entrepreneurs break down communication barriers and encourage each other to work together. Student entrepreneurship is the community, with its dynamics and interests. Entrepreneurship students are taught to find an alternative business model and mindset to solve a problem.

In macroeconomics, entrepreneurship is seen as one of the factors of economic growth. Several countries also view entrepreneurship as a solution to unemployment problems. Therefore, the promotion of entrepreneurial activity begins at the state level. Initiatives on regional and city level are aimed at encouraging, inspiring, and educating students. There are entrepreneurship centers that provide more hands-on support but they are in general for entrepreneurs and not only for students so they will not be reviewed here. Student entrepreneurship is strongly supported at the university level. Universities nurture the entrepreneurial dimension in their students by preparing them for the ever-changing labor market. So that they will be able to build career path. For achieving that universities have educational programs, entrepreneurial events, student clubs, co-workings, accelerators, incubators, etc.

Integrating entrepreneurial competitions into university extra curriculum activities makes possible to get skills and knowledge that are demanded at the labor market, especially for those who will pursue the career of self-employed or an entrepreneur. Such skills as setting aims and tasks, team working, brainstorming, and working out the decision in the limited period, coping the stress, presenting skills. Besides, the tangible deliverable that the challenge competitions can have it is a society impact.

Entrepreneurial student activities take place in a social, organizational, and spatial context. Organizational context represents a set of opportunities and limitations that influence the occurrence and meaning of organizational behavior. One of the limitations of entrepreneurial education is the complexity of the subject and the multicomponent nature of those skills that must be passed on to the student in the learning process.

Social entrepreneurship is a significant lever for the progress of a community, region, country, as well as a testing ground for the development of entrepreneurial, creative, managerial skills of students, as well as a platform for uniting like-minded people. The key benefit of supporting student entrepreneurship through social projects is the formation of a strong brand of the local community, direct benefits of target audiences in the location of the project, and activation of the volunteer movement. The limitation of the practice of involving students in social entrepreneurship is the system-wide problems of this type of activity - underfunding, the difficulty of finding investors, a long payback period, as well as specific features such as the low status of socially oriented projects in the eyes of society, family, friends. These restrictions lead to a decrease in motivation to participate in socially oriented projects, and draw students' attention to strictly commercial projects.

Standing apart are global youth practice-oriented NGOs and project contests, the largest of which focuses on social entrepreneurship.

Infrastructure services for helping student teams are in demand in the world and are implemented in a variety of formats. The main function of such spaces is to reduce the costs of projects in the early stages, when they are most vulnerable to unnecessary financial burden. These new types of spaces are helping startups, incl. student, quickly go from idea to concrete implementation, quickly test different hypotheses and exchange experience with teams that work in related fields. New types of spaces that support and facilitate the entrepreneurial process are opening up everywhere in universities. The most advanced experience is with organizations from the UK, where branched and tailored spaces have been created to solve various types of problems. As it can be seen from the examples, Russian universities have also joined this mainstream.

Despite efforts of universities proposing students the formal curricula of university programs are insufficient for the full formation of ambitious students. Participating in student organizations gives informal and implicit flows of knowledge and practice leads students.

The motives of students to be members of student organizations are learning, getting the practical application of knowledge, practical experience, the intention to develop personal and professional skills, to be prepared for professional future, network. Additional benefits for during participating a student organization are learning successful stories and lessons learnt from outstanding entrepreneurs first-hand, personal relationships and acquaintanceships, being a team player of special projects, teamwork and leadership development, training such relevant skills as public speaking, creativity, negotiation, planning, time management, communication, digital marketing, practice marketing, market research, motivation. Student organizations give students chances to attract first financing for development their project. The non-formal and informal support within the student organization from the like-minded companions mitigates the fear to start technological business. Collaboration student organizations during events and activities with other departments of the university fosters the emergence of a technology business based on interdisciplinary research and development. Student organizations can lead to establishing partnerships with the industry, the consequence is attracting R&D to the university.

The forms of interaction between universities, innovative entrepreneurial projects and industry are different, but they pursue certain goals, the obvious ones are making a profit, being at the same time socially responsible, creating new high-tech jobs and improving the quality of life of society with the help of new R&Ds.

Incubators and accelerators at universities, most often with a pronounced industry focus, are used as a convenient format all over the world. The main advantages of university incubators can be the simplification of interaction with industrial partners due to the university brand, concentration of competencies and equipment at one point, as well as easy access to the youth most interested in entrepreneurship. Operating a successful incubator that interacts with the industry and attracts talent from university it is recommended to have wide network of partners, mentoring from representatives of the real sector, provide support to project at different stage of development, have presence of a laboratory / technical park and / or testing area, legal, to offer legal, patent and information support.

Technological entrepreneurship is of interest to students, first of all, as a way to implement bold innovative ideas, a way to transform scientific work at the university into a real product created by their hands for society. There are quite a few factors influencing the formation of a technological entrepreneurial environment, among which information should be highlighted:

- informational factors: information, training and support
- material factors: financing, equipment, space
- human factors: cooperation, mentoring, solidarity
- business factors: industry cooperation and marketing

The simplest and most obvious of the tools of stimulating and raising motivation of students to start entrepreneurial path are to deliver support and knowledge through student start-up clubs, technology transfer offices and basic entrepreneurship training programs. These can significantly increase the entrepreneurial activity of university students and the success of the implementation of their ideas. Separately, it is worth noting the synergy of processes in the field of entrepreneurship at the university, which is expressed in the much greater involvement and success of those universities in which teachers and employees are themselves entrepreneurs or startups, which forms an inclusive environment of mutual growth for students. The formation of an entrepreneurial culture at the university can be accelerated and facilitated if applicants to university already have a certain experience and knowledge base that can be obtained by organizing entrepreneurship schools for high school students.

The border region of Russia and Finland is a fertile ground for the development of student entrepreneurship. A large number of universities, the activity of public authorities, development projects allow building a long-term strategy of interaction between interested actors in the region, which will increase the density of small innovative companies, related services and the overall flow of investments.

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Annex 1

Student Entrepreneur&Startup questionnaire

Student Technology Entrepreneurship&Startups. Survey

We invite you to participate in the survey on the study of student technology entrepreneurship. The survey is conducted within the framework of the international project Start-up Connect under the Russia-South-East Finland cross-border program 2014-2020 (Funded by the European Union, the Russian Federation and the Republic of Finland). The survey will take you about 7 minutes.

Thank you for your participation!

1. Are you interested in technology entrepreneurship and/or start-ups?

Mark only one.

- ☐ yes, I am, I believe that there are many opportunities at the University to try technological entrepreneurship while studying
- ☐ yes, I am, I do it beyond the University and it is not connected to my studies at the University
- ☐ no, I am not, it is not among my interests
- ☐ no, I am not at present, but I think that in the future my profession will be connected with technology entrepreneurship
- ☐ Other: _____

2. Have you had any experience of participating in a startup or a technology project that could become a startup?

Mark only one.

- ☐ yes, I have
- ☐ yes, I have, I have an idea for a project and am developing it
- ☐ no, I have not, but it sounds interesting for me
- ☐ no, I have not, I am not interested in it
- ☐ Other: _____

3. If you replied positively on the previous question, rate how successful you consider the experience to be (from the lowest 0 to the highest 5)

Mark only one.

the lowest
(no tangible result)



0



1



2



3



4



5

the highest
(tangible result)

4. If you chose the highest "5" in the previous reply, what do you consider as a result of your experience? (write shortly) (for example, a small company)



5. Have you ever participated in a university accelerator or pre-accelerator?

Mark only one.

☐ yes, I have, this is a good opportunity to develop your technological project (start-up)

☐ no, I have not, but I am going, I have an idea for a project

☐ no, I have not, but it would be interesting to participate

☐ no, I have not, I am not interested in it

☐ no, I have not, my university does not have an accelerator / pre-accelerator

☐ no, I have not

☐ Other: _____

6. Do you participate in events for development of entrepreneurship mindset?

(for example, lectures or workshops by business experts, Summer Schools and etc.)

Mark only one.

- ☐ yes, I do, I'm interested in it
- ☐ yes, I do, I have even taken short-term educational courses on technology entrepreneurship
- ☐ no, I do not, I'm not interested
- ☐ no, I do not, I don't know if there are such events at my university
- ☐ no, I do not
- ☐ Other: _____

7. If yes, please, rate how useful do you find it to be? From the lowest 0 to the highest 5

Mark only one.

- the lowest (unuseful) ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 the highest (extremely useful)

8. Have you ever participated in student entrepreneurship initiatives / clubs?

Mark only one.

- ☐ yes, I do, I think it is useful for the development of entrepreneurial skills and abilities
- ☐ no, I don't, because I do not think it is helpful
- ☐ no, I don't, I have not heard about such student entrepreneurship initiatives / clubs
- ☐ no, I do not
- ☐ Other: _____

9. Do you think the university (you study in) has the infrastructure and technical capacities for the development of technological entrepreneurship and / or start-ups?

Mark only one.

- ☐ yes, I do, there are many sites where you can engage in project development
- ☐ yes, I do, I consider that there is some, but it is not enough
- ☐ no, I don't think so

☐ no, I do not know

☐ Other: _____

10. Do you use if you need a prototyping center, a fab lab, an engineering centers at the university (you study in)?

Mark only one.

☐ yes, I do

☐ no, I don't, but perhaps I will in the future

☐ no, I don't, there is no need

☐ no, I don't, I don't know if there is any of these at the university

☐ Other: _____



11. Please, rate from the lowest "0" to the highest "5" the quality of entrepreneurial services and capacities at the university you study in

Mark only one.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12. What do you think the university lack in the infrastructure and technical capacities for the development of technological entrepreneurship and / or start-ups?

13. What kind of services, infrastructure, technical capacities provided by the university would you like to have access to?

14. What University you study at?

15. What country do you study in?

16. What is the Faculty you study at?

17. Please, choose what degree you study at

Mark only one.

☐ a bachelor degree

☐ a master degree

☐ other

18. What is your age?

19. Please, choose one

Mark only one.

☐ Male

☐ Female