MYGATEWAY

Talent Acquisition Model

2019

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Introduction

Rapid changing social and business environments are visible in every aspects of life influenced by the new innovative age. On industry level, technology today is creating diverse and novel jobs, and next generations will have to be equipped with different skills and talents in order to efficiently adapt to the new age. One of the key pillars of future work ecosystem will also be to identify the right talent needed for the right work positions. Based on the (Racounter, 2017) report, biggest challenge for digital technology businesses and future of work will be access to talent.

As future of work becomes more virtual, diverse and culturally different, the need for better ways and skills to manage time, people, resources will be crucial.

Since the new industrial changes are moving faster than ever predicted, the learning and teaching curves have to be redesigned to go side by side with the technology changes. The process of learning has to become more in tune with the demands of our time and the needs of today's students, startup ecosystem and work places. As the startups are recognized as the growing trend of the last decade, future of work will include many young entrepreneurs trying to find a startup in their local and global ecosystem.

In order to seek out the best possible ways to solve a problem, collaborate within different groups, be in a position where entrepreneurship with startups is seen as a solution, talent has to be recognized and developed with specific set of required skills, motivation and awareness. Right motivation, soft skills, hard skills and having an active startup culture can offer an answer for the future challenges of Universities and overall better work performance. Today's business leaders are also recognizing the significance of 21 century skills. Soft, 21 century skills can represent the missing link between disruptive innovative systems, startups, future of work and people. Having all these facts in mind, development of talent should be more strategically integrated in the curriculum of educational institutions. Higher educational institutions must be able to recognize and design the curriculum that creates innovative, empathic, ethical, creative problem solvers to confront increasingly complex global problems and technology changes by founding a startup or having the skills and entrepreneurial mindset required to adapt to the new digital age.

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Talent Model Overview

In order to provide the necessary information for talent model development of CEE countries, the Model will include different fields, form startup ecosystem, university entrepreneurial environment, individual motivations, skills and different knowledge resources.

According to (East West Digital News, 2018), CEE counties are continuing to develop and invest in already active startup ecosystems with a strong IT engineering force, which is greatly helping the emergence of startup activity. As the countries are further developing, they have tendency to switch from IT outsourcing models to more product-oriented activities (East West Digital News, 2018) implying there is need for not just technical skills, but overall development of skills and talent enabling the switch to more product-oriented, value-added activities. Product oriented activities require the startups to have the ability not to outsource but have all the resources (from business development, technical acumen to complete human resources aspect) in one place. The point of developing economy that serves as a platform for a total business evolvement requires investment in all business aspect, especially in talents and skills.

In order to respond to ever-growing specific economy trends in each country, Universities need an active startup ecosystem combined with knowledge of current technology trends and work industry trends. The reason why the model is developed within these fields is to provide a comprehensive overview of today's entrepreneurial ecosystem in each University of the three countries, Romania, Slovenia and Czech Republic. Following this methodology, talents are developed in the university and the main focus will be on university ecosystems and settings/environment that are coexisting in each county.

This model is designed to include the following sections: University entrepreneurial environment and ecosystem stakeholders, Emerging skills, Future Trends, Entrepreneurial skills – soft, hard (technical), digital and financial and Online learning platforms. Each university within its faculties usually has strategic goals for entrepreneurship development. The only difference is which level of development universities are currently developed (by different categories), and in what kind of local market and ecosystem universities coexist in.

Higher educational institutions, as the pillars of educational system, have a crucial challenge to reduce the gap between demand for new talent on the work market, setting the entrepreneurial environment, and have a general view on preparing the student for today's work place in the industry.

The Talent Acquisition Model was designed to identify the entrepreneurial pillars of University and give information on possibilities, strengths and environments of a startup ecosystem University currently possess, from the aspect of students.

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The first chapter of the Talent Model Acquisition is identifying stakeholders of an active university startup ecosystem. Stakeholder are diversified and categorized by the role and value they bring in the startup ecosystem. The following chapter connects stakeholders and university entrepreneurial environment. Specifically, what kind of entrepreneurial framework make an impactful activity to enable the startup actions in Universities. The proposed framework from researchers is utilized not just as a literature for the Model, but also part of the frameworks is directly used in designing the Model outputs as well. Next chapter represents emerging entrepreneurial and future work skills and competences. The skill set includes 21 century skills[1], technical and financial skills of current startup sector and work place demand. In order to point out the future trends in different technology knowledge and usage, the last chapter points out the current state and predictions of the future situation on various technology, work trends and online learning platforms.

The Talent Acquisition Model is designed in two parts. The first part, as described in the previous paragraph by chapters, represents literature, research and findings on the subjects of startup university ecosystems, entrepreneurial environments, skills and future technology trends. The first part is used as a base for the designing the Model itself with included chapters as the pillars of the Model.

The second part of the document represent the research and testing of the Model. The primary goal of this Model is to identify different points of possible talent development in University setting. The methodology utilized to identify talent development (in 4 different pillars) was done by a Survey disseminated to students of different countries with the focus on Romania, Slovenia and Czech Republic. Based on the literature review and all the information gather from interviews made with different stakeholders, it was decided that the most objective approach to investigate the entrepreneurial possibilities and motivations on Universities was from the perspective of students. Based on the student responses of the Survey, responses of each University have been analysed and strengths and upgrades in different pillars of the model were identified. All the information and analysis of direct field research is represented in the second part of the document

1. The goals of Talent Acquisition Model

The Talent Acquisition Model is designed to provide an answer on how to identify key pillars, components and stakeholders of talent development with a focus on entrepreneurship at the University. Talent development in this model consist of different kinds of entrepreneurial, business components and ultimately is connected to startup ecosystem of the University

[1] "21st-Century Skills" is a term frequently used to define what students should know and be able to do to enter the workforce and make decisions in the modern world (McComas, 2014)

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itself. Therefore, the goals of this Talent model represent a set of parameters constructing a meaningful matrix to evaluate University startup ecosystem from the aspect of students, and includes the following goals:

- Identifying strength and suggesting upgrades to University Entrepreneurial ecosystems
- Creating a space for increasing the entrepreneurial related themes in curriculum and faculty setting/environment
- Enable the University to create more sophisticated entrepreneurial structure
- Makes concrete actions towards talent awareness and development
- Serves as a platform for students and young innovators, startups and companies, by identifying and realizing the need for diverse set of skills in startup setting

2. Talent Acquisition Model Stakeholders

The development of sophisticated technology trends has resulted in a gap of industry requirements and skills lectured by higher educational institutions (HEI). A growing body of evidence recognizes the importance of soft skills in predicting long-term life outcomes, including labour market outcomes as well as social and health behaviour (Kautz *et al.*, 2014). Hard and soft skills are directly connected with higher work performances, and as such, should be more valued through the process of education, especially in university curriculums.

The role of different kind of talents, traits, skills become even more important in understanding future concepts influenced by technology, global movements, new educational trends and available open resources. Individuals, now more than ever in human history, have access to different kind of online learning methods to improve or discover the new soft or hard skills.

Higher educational institutions, as the pillars of educational system, have the challenge to adopt the novel trends of transferring and teaching skills in the institutions curriculums in order to present and offer the new possibilities of subjects and skills of the future. Establishing a successful entrepreneurial university ecosystem requires collabouration and contribution from all stakeholders within and outside university (Greene PG, 2010).Entrepreneurship ecosystem of active HEI includes collabourations and initiatives between startups, scale-ups, student organizations, hubs and accelerators, local and government institutions, NGO sector, alumni networks, corporations, other HEI. Transfer of knowledge is a constant process taking place in any kind of mentioned collabourations and

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can be introduced as the most important factor of the collaborations. Providing the students, a focus and topics of interest, offering a new kind of peer to peer or specific know-how transfer from all the stakeholders of the system can be introduced as one of key elements. Ultimately, we can conclude that an active HEI ecosystem offers a possibility of discovering and building on different kind of talents and skills for the students, researchers and professors.

Figure 1: Proposed Active HEI/University startup ecosystem of Talent Acquisition Model

2.1. Higher educational institutions

As notes by (Argote, L., & Ingram, 2000), the necessary knowledge and technology transfer within an entrepreneurial society occurs when the experiences of actors in the economy influence the behaviour and activities of others.

The ecosystem is built in order to support, embrace and build on the new emerging structures of talent, skills, work place and generic trends in education-work/supply-demands construct.

Education institutions can be identified as the first connection for the active ecosystem. In order to successfully transit from traditional institution to institution that enables students to obtain new skills within the campus, some HEI made important changes in system. The first step usually is to make entrepreneurship programs, with actual startup, business run by

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students, and while working for the newly founded business, exploring all the trends and methodologies (lean, experimentation) currently on the market and making real interaction with customers.

In order to get the current situation in what kind of programs and learning context is provided by the best world universities in entrepreneurship and business education, the next paragraphs consist of the reviews from the best European and American Universities.

According to international ranking of Universities by Financial times made each year[2], top five European universities on Business Education is presented in the following table:

University	Full time MBA Program 2018	Executive MBA 2018	Master's in management 2018	Open programs - Executive Education 2018	Custom programs - Executive Education 2018	Faculty with doctorate (%)
London Business School, UK	2	9	3	6	3	99%
HEC Paris, France	6	4	2	7	4	100%
Insead Europe Campus, France	1	8	-	4	5	96%
University of St Gallen, Switzerland	15	26	1	14	18	100%
Iese Business School, Spain	3	5	-	3	1	100%

Figure 2: Top 5 business schools in Europe; Source: The Financial Times

What is noticeable in this ranking is the ratio of designed business Scholl programs is clear focused on MBA and Executive education programs. One point important for this ranking is

[2] http://rankings.ft.com/businessschoolrankings/european-business-school-rankings-2018
It is a composite ranking based on the combined performance of Europe's leading schools across the five main rankings of programmes published by the FT in 2018: MBA, executive MBA, Masters in Management (MiM) and the two rankings of non-degree executive education programmes. A European schools rank is produced for each of these main rankings. MBA, EMBA and MiM account for 25 per cent each of each school's total performance. For executive education, the scores obtained for customised and open programmes each account for 12.5 per cent.

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the percentage of faculty staff with doctorate in the top 5 Universities is higher than 96% and could be an important factor for delivering the right set of knowledge, based on Financial Times ranking.

The Financial Times ranking also made a list of top entrepreneurship MBA[3] programs for 2018, and top 5 European colleges are presented with the following information:

University	Country	Started company (%)	Female entrepreneurs (%)	Equity (%)
Lancaster University Management School	**UK**	**33**	**25**	**43**
City, University of London: Cass	**UK**	**34**	**30**	**64**
WHU – Otto Beisheim School of Management	**Germany**	**31**	**11**	**78**
IMD Business School	**Switzerland**	**14**	**20**	**67**
University of Oxford: Saïd	**UK**	**28**	**15**	**100**

Figure 3: Top 5 MBA entrepreneurship programs in Europe; Source: The Financial Times

The country with biggest number of existing startups[4], and the ecosystem for enabling the overall startup development in the world is USA. Startups made in campus surrounding are just one way of making a successful startup. But never the less, having entrepreneurship programs that can spark and motivate students to be future founders is an important aspect of an active ecosystem.

The US Princeton Review[5] rates the undergraduate and programs for entrepreneurs each year, and the next figure shows top 5 entrepreneurial universities connecting the basis and context they have built around the entrepreneurial programs (for undergraduates).

[3] http://rankings.ft.com/businessschoolrankings/top-mbas-for-entrepreneurship-2018

[4] https://www.startupranking.com/countries

[5] The annual survey looks at more than 300 colleges and universities (including one in Mexico) and weighs each institution's commitment to surrounding its students with world-class mentors, professors, and alumni, as well as an environment for budding entrepreneurs to thrive

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University	No. of entrepreneur-related courses:	Percent of faculty with entrepreneurial experience:	Students enrolled in entrepreneurship classes	Startups launched by grads in last 5 years:	Funding raised by grads in last 5 years:
Babson College	38	100%	2,283	321	$35,400,000
Houston, Texas	52	100%	1,948	284	$40,966,759
Brigham Young University	47	94%	5,814	508	$813,990,948
University of Michigan - Ann Arbor	54	63%	3,452	323	$68,020,525
Bernard Baruch College, The City University of New York	16	81%	942	832	$1,746,000,000

Figure 4: Top 5 entrepreneurial universities in US; Source: The US Princeton Review

Minimal number of started business per year in the presented universities is 64, and at least 63% of the staff from the faculty has an entrepreneurial experience. Range of courses related to entrepreneurship is from 16-54, which is very significant number in curriculum. But the most important fact is that on each of the ranked universities, student have the opportunity to found or work in the startup, and in the most practical way, get a real, hands-on learning of skills needed in the current market. To get to this level Universities have ensured the right collabourations and steps maximizing the influence of other key-players in their ecosystems. The Universities (with its stakeholders) also create a special startup funds to invest in the startups. In the UChicago Startup Investment Program, University of Chicago co-invests alongside established venture funds in startups led by UChicago faculty students, staff and

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alumni.[6] Alumni networks and student organizations are very developed and coordinated giving references to new students and businesses when in need for any startup enquiry. Each collabouration is planned and has its significance in the overall ecosystem, which can be one of the basis of active university ecosystem development.

Another example is London School of Business[7] which incubator program which makes available a comprehensive support package which allows occupants to continue to use the School's facilities including dedicated office space, and to access a full range of support offered by a number of professional service providers. Professional service providers are sponsors (London Business School's Institute of Innovation and Entrepreneurship) and companies, collabourators enabling different knowledge transfer and other concrete business values for the students of the program (supporters of the program are Amazon Web Services, HubSpot, iHorizon, Santander and others).

2.2. Business sector

New ideas and business with new value propositions are always interesting for business sector. New value from startups provided on the market can be viewed from different aspects. In university context, many corporates invest in startups developed in the university or seek for the talent from the startups. Investment are made in startups which usually have validated the product/services and have developed the startup within university facilities. Interesting example for University startup cooperation with business, venture capital and affiliate programs are Australian Universities[8]. Higher education in Australia has completely changed from the previous ways of functioning to the point where the last demo day (startup event) at Sydney University had over 20 VCs and investors attend, representing over $1.5 billion in funds under management. Universities are either launching startup programs or have expanded their program size or have added a new industry vertical to focus on, inviting businesses and VCs in the system.

Some Universities include business leader and company representatives[9] as part of advisory boards of various academic programs connected to entrepreneurship. Companies have a role as advisors and can be potential investors or partners to startups developed within the programs and incubators.

[6] https://polsky.uchicago.edu/programs-events/uchicago-startup-investment-program/

[7] https://www.london.edu/faculty-and-research/research-centres/iie/support-for-entrepreneurs/support-for-students/incubator-programme

[8] https://www.smartcompany.com.au/startupsmart/news/australias-startup-ecosystem-is-booming-and-universities-are-jumping-in/

[9] http://business.gmu.edu/corporate-partners/advisory-councils/

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2.3. Student organizations

Student groups or organizations can have a wide impact in forming an innovative entrepreneurial university environment. Entrepreneurship societies and clubs can perhaps be seen as: 'informal, non-accredited student-led societies or clubs whose main goal is to attract students who are interested in learning about enterprise and developing enterprising skills to either start their own businesses or to become more enterprising people (Pittaway *et al.*, 2011). Entrepreneurship societies and clubs come in many forms and can have different impacts on how to directly connect students to knowledge centres. In the next Figure are presented different student clubs/organization .(Pittaway *et al.*, 2011)

Club	Description
Entrepreneurship Club	Seek to educate, inspire and encourage entrepreneurial interest and which is directed at the development of enterprising skills. Entrepreneurship societies and clubs tend to engage in many activities and these include some combination of the following: speeches by entrepreneurs; networking events; competitions; and, seminars.
Students In Free Enterprise (SIFE)	SIFE students get involved with community projects designed to teach or develop free enterprise principles including: entrepreneurship; financial literacy; business ethics; sustainability; and personal success skills. Students learn about enterprise through working and teaching others.
European Federation of Junior Enterprises (JADE[9])	Students run professional consulting activities and manage small- to medium sized enterprises while at University
Young Enterprise	Typically run in schools in the UK Young Enterprise has a University program where students run small businesses for a specified period of time.
Investment Fund	Where students have full discretion over the management of a 'real money' portfolio usually involving stocks and shares. In many cases the fund is either donated by alumni or corporate sponsors.
Investment Club	Often involves the students making a small monthly or quarterly contribution into a central fund which they make decisions about with regard to investment

Figure 5: Entrepreneurship Clubs and Societies

Alumni networks creating value can be also added to the list since they are recognized as value driven organizations if led by planned activity. One example is INSEAD Global Entrepreneurship Club where students are connected in active alumni network provided with entrepreneurship networking event on local and global level[10].

Alumni networks can invest, recommend and make different kind of references for developing startups and individuals, especially alumni networks with traditional involvement

[10] https://www.insead.edu/alumni/global-entrepreneurship-club

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in university development. So far, the way to invest with alumni network was in infrastructure of university but new model of investing in the business can also be recognized leading more to concrete investments in students and researcher's startups or university funds which finance either accelerators, hubs or startups.

2.4. Accelerators

In the last decade, open innovation emerged as a new model, in which companies take advantage of the creativity of customers, suppliers, universities, research institutes or independent inventors, through partnerships, thereby obtaining more innovation, faster and with less spending.

University accelerators represent a facility equipped with knowing and technology to support the development of star-up ideas within the university, and later spin-off companies. In the context of open innovation, accelerators, science and technology parks can be recognized as intermediator from idea, innovation and market or companies. Universities often act as business incubators, allowing students and faculty to meet, form teams, and experiment with the idea of bringing technology from research labs to the market (Strom, 2012). Spin-offs formed in university setting are created by students or researcher and can be viewed as representative component of a positive result from successful entrepreneurial university ecosystem.

Universities produce intellectual property (IP) through research and is protected through patents, trademarks, or copyrights. University startups can transform IP into real products and make them a global product. The more successful a university is at transferring technologies out of the labouratory into products, often known as commercialization of technologies, the higher the rates of return on investment.

Formal accelerator or incubator programs at universities often help startups intensively over a period of time, providing mentoring, funding, office space, enhanced credibility, and, in some cases, oversight and management (Strom, 2012).).

The role of accelerator is to provide seed funding, mentoring, location or co-working, program and deals with startup/ideas in cohort matter, meaning it has a distinctive program composed of a period of few months. While incubator design shares a common theme of flexibility, it does more: the design offers cues to people using the space, inspiring them to connect in new ways[11]. There are differences between incubators, science and technology parks and accelerators, but which ever kind of form exists in the university setting, it is supposed to provide the mix of the mentioned services.

[11] https://www.gensler.com/research-insight/in-focus/the-rise-of-academic-incubators

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2.5. Non-governmental organizations

Partnerships with non-governmental organizations can also be a very valuable tool of building a successful and active talent pool. One of the examples is the global non-profit Endeavor, which focuses on entrepreneurship development in emerging economies, who, with Endeavor's mentoring are turning their successes into role models of the community[12].

Some foundations or organizations have specific funds that can be used to participle in some of the activities within university settings. Also, depending on the cause the NGO is founded for, students and university can be a right address for some organization dealing with specific problems and activities can be connected with the university.

It is also a usual practice for NGOs and Universities to work together on project founded by international organizations where the reach and impact can be greater for both sides.

2.6. Governmental institutions

When it is a question of forming a business accelerator, tech park or incubator in university setting, local institution is more than interested to be involved. Usually local governments are one of the shareholders of the newly founded accelerator because their interest is to empower local employment as a first probable outcome when opening an incubator, as an example of Madan Parque incubator in Caparica, Lisbon – founded by two Municipalities and University of NOVA Lisboa.[13]

All levels of governmental institution usually have different funds for development when it's a question of entrepreneurship, and the universities use it. Some examples can be for financing a program, partnership or making an investment fund. The government should strive to recognize innovative startups and help them to grow in any setting especially in university. In this case, active influence on the development and strengthening of economic activity in the country starts from university and not the labour market.

2.7. Entrepreneurial CEE environment overview

In regards of making the identification of the skills and environment needed for startup ecosystem, a short overview of startup environment will be presented. Continuing the theme of active entrepreneurial talent pool as indicated through the stakeholders, every point in the system has its value and goals of building an entrepreneurial university environment.

[12] https://endeavor.org/
[13] https://madanparque.pt/missao/

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Specifically, this environment is also highly influenced by the country itself and by all the features of startup ecosystem currently present in the country.

In the document of D2.1 In-depth Country analysis more relevant information is presented for each CEE country, but the reason for introducing the Global Entrepreneurship and Development Index[14] (GEDI) for each country is to have a more focused entrepreneurial factor for startup ecosystem. The 14 Pillars Entrepreneurial Framework are presented for each country (for the year of 2018.) with relevant information on ratings from Opportunity Perspective to Risk Capital, which can be used as an introduction information for the entrepreneurial environment of each country. The information GEDI Index provides are mix of attitudes, resources, and infrastructure known as the entrepreneurship 'ecosystem' and shows how each country performs in both the domestic and international context.

2.7.1. Slovenia

As it is identified by Global Entrepreneurship and Development Index, startup skills and risk acceptance are the most developed pillars for Slovenian environment.

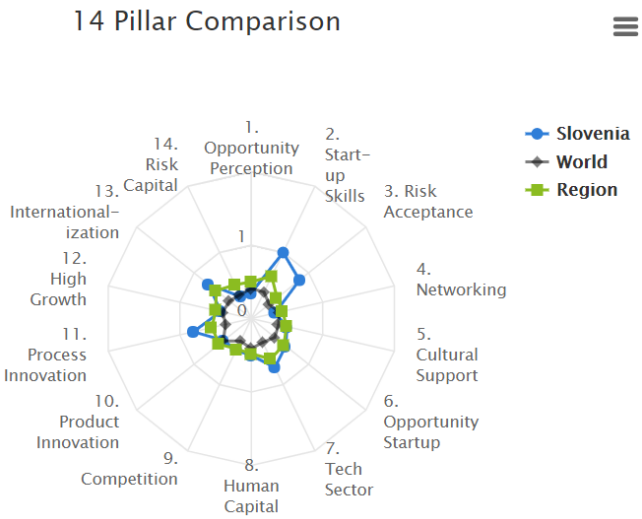

Figure 6: Global Entrepreneurship and Development Index for Slovenia

This information is very positive for Slovenian ecosystem since the two mentioned factors are one of the most important features for highly successful startup ecosystems. Risk Capital, Opportunity perception and Networking are identified as les developed, which can serve as a valuable input to make different kind of activities in order to influence the development through various startup stakeholders.

[14] The GEDI methodology collects data on the entrepreneurial attitudes, abilities and aspirations of the local population and then weights these against the prevailing social and economic 'infrastructure' - this includes aspects such as broadband connectivity and the transport links to external markets. This process creates 14 'pillars' which GEDI uses to measure the health of the regional ecosystem.

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2.7.2. Czech Republic

Internalization and Product Innovation are the most developed features, which presents a good fundament to global market reach of future startups.

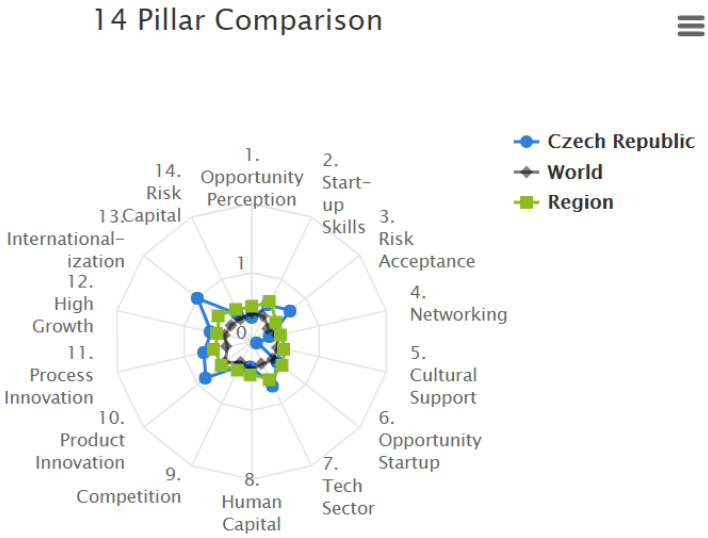

Figure 7: Global Entrepreneurship and Development Index for Czech Republic

According to this index, the most undeveloped pillars are Startup opportunities, Networking and Opportunity perception. Comparing to the region, Internalization is the most developed pillar and can also serve as base for future development of ecosystem through cooperation's and partnerships established in the region.

2.7.3. Romania

Romania has the most developed Entrepreneurship ecosystem among the three CEE countries, according to GEI Index.

Internalization, Risk Capital and Startup Skills as the leading features, and Opportunity perception with Networking and Risk Acceptance as the lowest developed pillars of the system. What is also important to note that countries around Romanian region are more developed than two previous countries, but also since its region is highly competitive. Romania has the opportunity to make necessary adjustment and improvement in order to be more competitive in the region and maintain the leader aspect for first two pillars.

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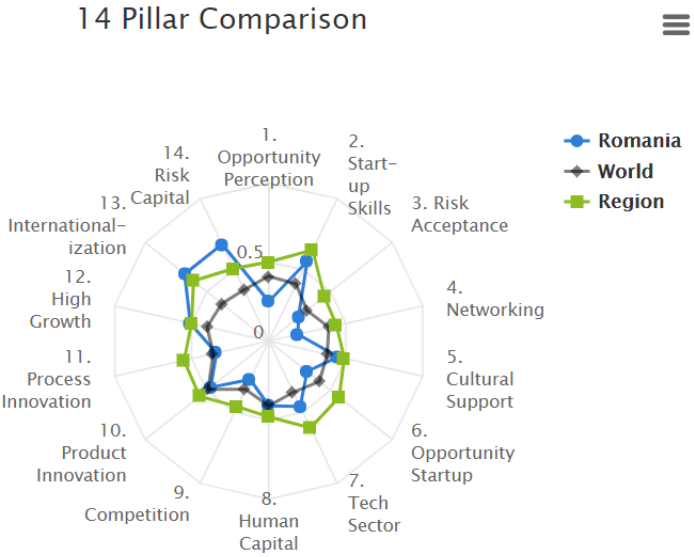

Figure 8: Global Entrepreneurship and Development Index for Romania

3. University entrepreneurial environment

The way we do things around here (Lundy O. and Cowling, 1996) is probably the most known definition of organizational culture which can be easily used in environmental and cultural setting of Universities. The courses, programs, initiatives, activities around entrepreneurship and innovation including high level diversity can define an entrepreneurial environment. All high education institutions (HEI) use some of the innovative, entrepreneurial, cooperative or practical formats to build their environment, ecosystem.

University courses do not often provide students with the chance to see the link between their actions and real-life out- comes, although it would be possible (Rombach *et al.*, 2008). The question that takes priority in providing the relevant and marketable education is what kind of different available activities, tools, courses, online or offline educational interaction HEI create in order to have a successful environment and a fruitful ground for startup founding or preparing students for today's workplace. The entrepreneurship ecosystem consists of a set of individual elements—such as leadership, culture, capital markets, and open minded customers—that combine in complex ways (Isenberg, 2010). Implying that the one of the highly important fact of an active ecosystem is the right aimed and efficiently combined element.

An entrepreneurial university is a natural incubator that, by adopting a coordinated strategy across critical activities (e.g., teaching, research and entrepreneurship), tries to provide an adequate atmosphere in which the university community (e.g., academics, students and

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staff) can explore, evaluate and exploit ideas that could be transformed into social and economic entrepreneurial initiatives (Kirby, Guerrero and Urbano, 2011).

In the previous chapter the key stakeholders are identified as the stakeholders that serve as an active talent pool for students and startup activities. This chapter is more focused on making a successful internal environment what can be defined as set of different activates within curriculum and partnerships that enable firstly students, but not excluding any players in the ecosystem, to gain new skills, abilities in entrepreneurship field. Meaning not all students will found a startup but designing an environment where all stakeholders will have novel, structured ways of gaining skills and real hands-on experience of today's startup, digital era world.

The goal of the learning environment is to allow students to apply their advanced skills in an environment and to deliver meaningful results for their customers (Fagerholm *et al.*, 2018). In that note, universities should have a learning entrepreneurial environment that can enable learning principles, not just for today work place, but given the advanced tech trends, equip them for the future prospects.

3.1. Framework for entrepreneurial universities

The OECD developed A Guiding Framework for Entrepreneurial Universities, meant to serve as a guide for universities to strategically incorporate entrepreneurship in the curriculums and make autonomous ecosystems ('A Guiding Framework for Entrepreneurial Universities', 2012).

Figure 9: The Entrepreneurial University Framework by OECD

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The Guidelines note the fact that in order to develop as an entrepreneurial organization, with an entrepreneurial culture, the entrepreneurial activities should be established in the strategy. It is also stated that universities should have an entrepreneurship structure in place which coordinates activities within the institution and with other stakeholders within the local entrepreneurship ecosystem.

The guideline has all 7-subsections explained in detailed way, followed by possible questions in order to determine the level of development within the presented framework. As a strategic document, the 7 subsections form an example what can be expected from a university entrepreneurial ecosystem, by OECD recommendation.

Entrepreneurial universities could have an impact on economic concepts connected to human capital. The latter term refers to the stock of competencies, knowledge, abilities, and skills gained through education and training (Gustomo and Ghina, 2017). Therefore, entrepreneurial universities could contribute to economic impact through the generation, attraction, and retention of talented human capital and entrepreneurs (Guerrero, Cunningham and Urbano, 2015). Skills, capacities, knowledge generation should be the result from the developed entrepreneurial university focused on creating sustainably ecosystem focused on future market trends.(Gustomo and Ghina, 2017) proposed a systematic framework which covers three important key stakeholders within a university, namely; student, lecturer, and institution. This framework gives deeper analysis and detailed structure of roles and responsibilities of the key stakeholders in the framework, regarding the OECD Guiding Framework for Entrepreneurial Universities. In this systematic framework, all key stakeholders have their own role and responsibility regarding the three core activities within university; teaching activities, research activities, and third-stream activities.

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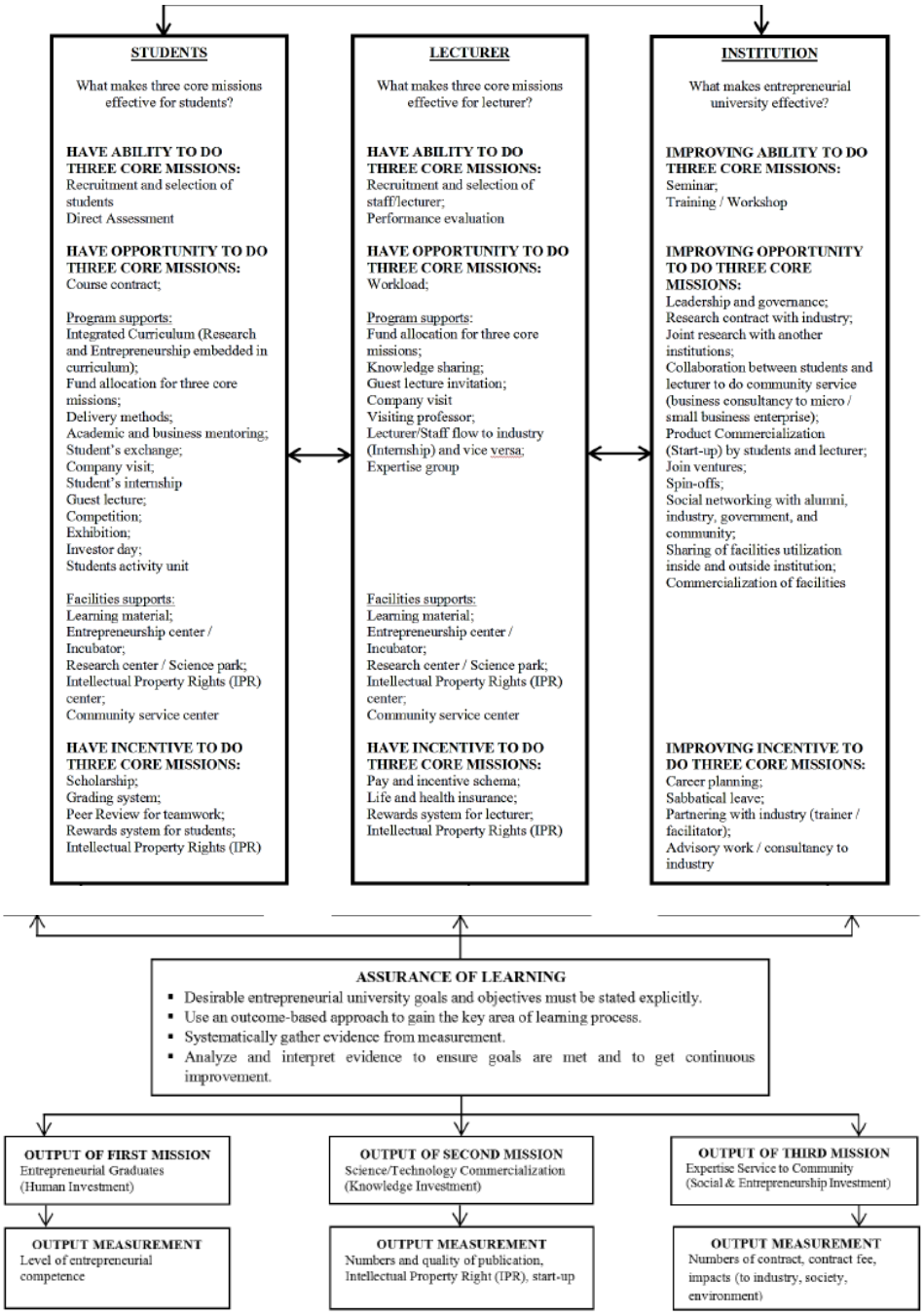

Figure 10: The framework of Entrepreneurial University (EU)

The Framework proposes the concept which assures the learning in all three core activities and guarantees the quality of core activities. Furthermore, the concept provides the concrete outputs and measurement for each activity of the mission goals. In this way, the framework enables HEI to measure the impact of every individual goal and activity, and in the longer period can serve as a valuable instrument of measuring the systematic impact of entrepreneurial strategy of institution.

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As one of the most successful entrepreneurial ecosystems in the world - The Babson Entrepreneurship Ecosystem Project, it is noted that at the heart of the entrepreneurship ecosystem strategy is a view of what factors comprise the entrepreneurship ecosystem and how it evolves. This entrepreneurship ecosystem consists of a dozen or so elements although they are idiosyncratic because they interact in very complex ways, are always present if entrepreneurship is self-sustaining. So although the combinations are always unique, in order for there to be self-sustaining entrepreneurship, you need conducive policy, markets, capital, human skills, culture, and supports (Isenberg, 2011).

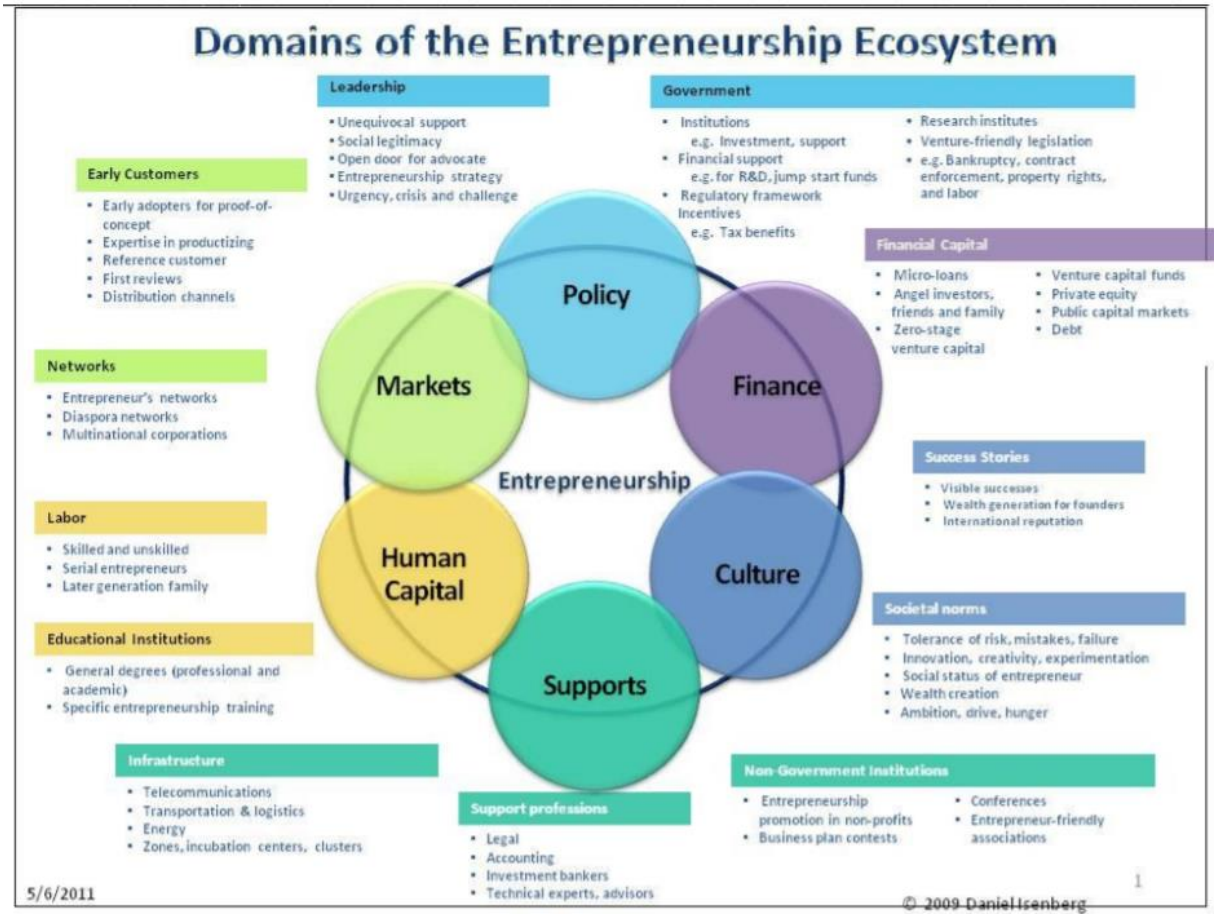

Figure 11: Domains of Entrepreneurship Ecosystem (The Babson Entrepreneurship Ecosystem Project)

This diagram is beneficial in part because it reflects the world as it impinges on the entrepreneur's perceptions, and this how it impacts the entrepreneur's decisions and success (Isenberg, 2011). As the University is the setting for enabling students for future entrepreneurs, the domains are just the needed information, to look the system from the aspect of the entrepreneurs and what kind of paths can be intertwined. The diagram reflects on already developed system and perception, but the featured domains can be highly valuable while strategizing and incorporating new entrepreneurial structures in the University environment.

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From the institution perspective focusing on long-term impact, examples of the successful entrepreneurial universities are presented on the next figure. The table diversifies different entrepreneurial Universities with strategically developed programs in which many startups and entrepreneurial features have been created in the past years and which skills and learning context are transferred through the programs. For this comparison, the US Universities have been selected as some of the Universities have been continuously ranked as the most entrepreneurial universities offering state of art programs on different levels, from business to specific entrepreneurship programs[15].

[15] https://www.entrepreneur.com/topcolleges
https://www.forbes.com/sites/robynshulman/2017/11/02/these-4-universities-offer-unique-entrepreneurship-programs-for-college-students/#b2786dcfaf90

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Name of the University	Name of the program	Features	Skills and learning context transferred through the program
University of Dayton	Bachelor of Science in Entrepreneurship 16	New-venture competitions among students (more than $100,000 in cash prizes and $150,000 of in-kind support). Existing business run by students, learning by doing working in startups (Flyer Enterprises is the fourth largest student-run business in the country) During the Sophomore Experience, students create and run a microbusiness with $5,000 in startup capital Active academic startup ecosystem (existing student startups on the campus) Graduates have started 57 companies and have collectively raised more than $13 million in funding.	Management Leadership Entrepreneurship Sales management (identified as a highly sought skill from the University)
Babson College	F.W. Olin Graduate School at Babson College Undergraduate Program: Bachelor of Science in Business Graduate Program: The Master of Science in Entrepreneurial Leadership (MSEL)17	Entrepreneurial Thought & Action (ET&A) methodology teaching undergraduates, graduates, and executives to balance action, experimentation, and creativity with a deep understanding of business fundamentals and rigorous analysis as the ideal approach to creating economic and social value. Foundations of Management and Entrepreneurship (FME) in Undergraduate Program, focusing on students founding their business with faculty funds MSEL Graduate program nine-month, cohort-based program where students participate in unique experiential learning opportunities including creation of a new venture, consulting for an organization on a real	Management Ideation, experimentation, prototyping – Lean Methodology Creativity Hands-on entrepreneurship International context

[16] https://www.udayton.edu/business/academics/undergraduate/management_and_marketing/programs/entrepreneurship-bs.php
[17] http://www.babson.edu/Academics/graduate/msel/Pages/home.aspx

	The WIN Lab: (Women Innovating Now (WIN) Lab Intensity	business challenge, and exploring the global business landscape through an experience abroad Women entrepreneurs are transformed into CEOs through entrepreneurship coursework, applied experiences, mentoring, and milestone achievements designed to move early-stage ventures from prototype to successful launch and growth. This track experience combines an 8-month, 3-credit lab experience with a series of entrepreneurship electives and comprises.	
Miami University	Entrepreneurship Program	A startup/business plan competition for students (an investment of up to $65,000 per student recipient per school year) Mentorship opportunities for entrepreneurs Sponsored off-campus networking opportunities An International Program in which students work with micro-entrepreneurs in developing areas Semester-long immersion with Interactive Media Studies in Silicon Valley Social Entrepreneurship track (ranked best social entrepreneurship program in the country) 250-person Living Learning Community in Entrepreneurship Program established Redhawk Ventures (RV), one of the few student-run venture capital funds in the nation. They invest up to $25,000 of university assets into selected student and alumni businesses.	

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Manchester University Management School	The Woltemade Centre for Economics, Business and Entrepreneurship	Culture is very entrepreneurial. For example, students are able to write proposals for university-funded grants to research issues anywhere in the world. Unique fellowships geared toward supporting the entrepreneurial spirit, Entrepreneurial Scholars Program and the newly launched Latham Entrepreneurial Scholars Program, which will help fellows learn skills such as taking action on their ideas, persevering through the trials associated with taking action, and building a community to support their actions and ideas.	Entrepreneurial Culture established International Research grants Fellowships Management and leadership skills Community building
Lancaster University Management School	Management and Entrepreneurship BSc Hons - 2020 Entry[18]	Entrepreneurial education, drawing on world-leading theories covering creativity, opportunity recognition, sales, finance, entrepreneurial leadership and effective communication. Choices from Management School topics such as Accounting and Finance, Economics, Marketing and Management Science. Focus on business model innovation, and you will take on real world challenges in sales, networking and innovation. With 50 entrepreneurs-in-residence acts as sounding boards for student ideas, participating in lectures and have regular working lunches with students. The focus is on practice, skills and understanding.	Business Model Innovation Entrepreneurs-in-residence Entrepreneurial leadership and effective communication skills

Figure 12: Entrepreneurial universities and program features (Sources: Forbes.com and Financial Times Ranking)

[18] https://www.lancaster.ac.uk/study/undergraduate/courses/entrepreneurship-and-management-bsc-hons-n1n2/

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Within the features section, it is quite noticeable that many programs are being developed with other stakeholders in the ecosystem (from local alumni to international context) and the students are provided with various entrepreneurial themes, from social entrepreneurship to international university grant research.

When it comes to skills, it can easily be concluded that lean startup methodology is being actively used at faculties along with developing 21centruy skills.

4. Emerging skills and competencies

In order to stop and reduce the scenario where technological change/trends are accompanied by talent shortages and mass unemployment, it is critical that first universities and governments take an active role in supporting existing education and workforce concepts through reskilling and upskilling new talents. This fact also puts an emphasis on individuals "to take a proactive approach to their own lifelong learning and that governments create an enabling environment, rapidly and creatively, to assist in these efforts" (World Economic Forum, 2018b).

The new concepts of individual lifelong learning are also recognized as one of the basic new components of learning in 21st century, "the inevitability of lifelong learning in knowledge-oriented societies implies that school systems should have different objectives and characteristics than if education were considered to have been completed when a student leaves initial education" (OECD/CERI, 2008). The ecosystem should ideally provide the continues support for individual proactive learning and thus having a possibility of upgrading or learning new skills, in the local, international and finally virtual environment. Universities with new curriculums, should also be able to recognize the new trends on the market and act accordingly to work trend requirement of new skill development from startups to corporate industry requirements. An overview of the crucial skills needed for the future work posts from four different sources including 21 Century Skills book by (Trilling and Fadel, 2009) is shown in the next figure.

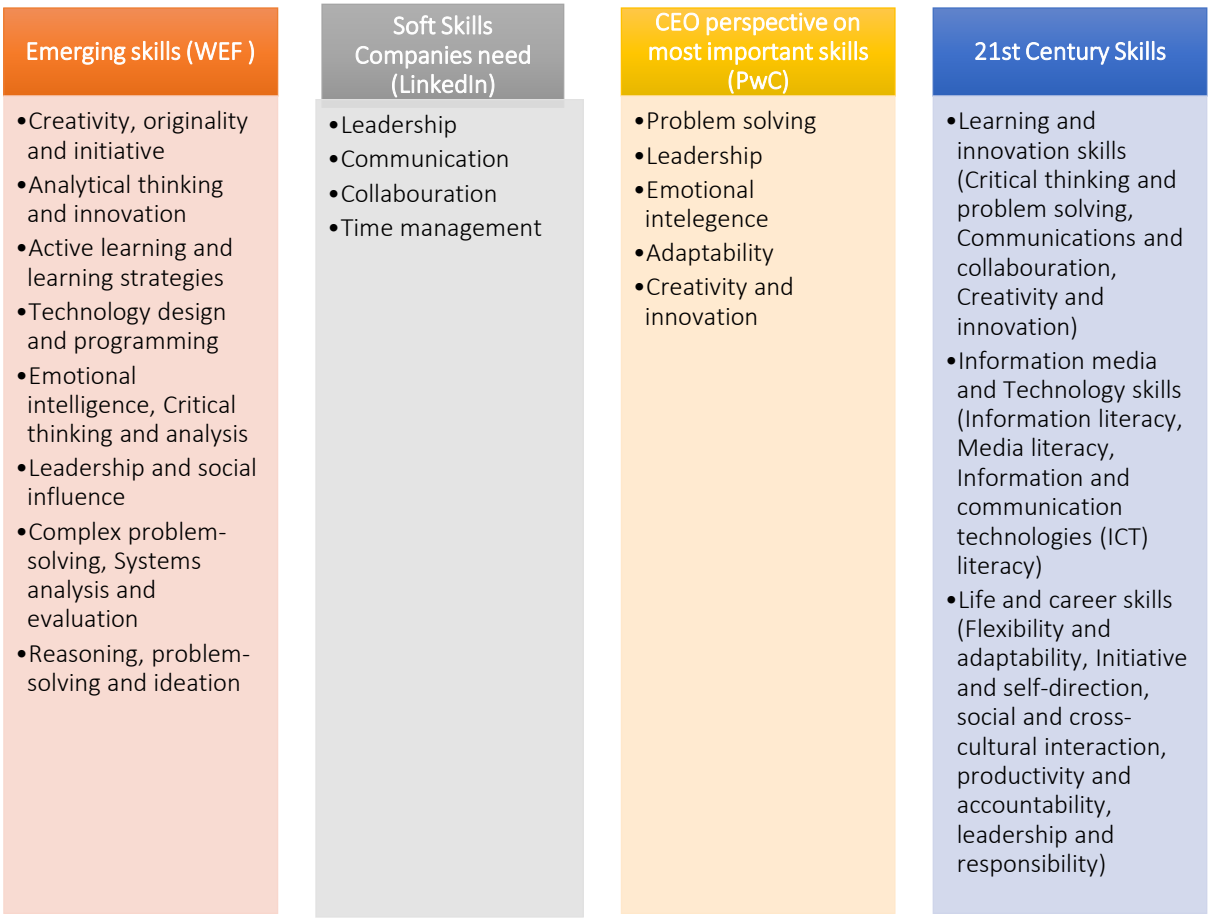

Figure 13: Comparison of the Four Resources (Top Rated Skills)

All the mentioned skills from different source can be grouped mainly as soft skills and competencies. Soft skills are skills often referred to as interpersonal, cognitive, human, people, or behavioural skills, and have a strong focus on personal behaviour and managing relationships between people.

Many authors also connect soft skills with the term of 21 century skills. The reason why the connections are made is the fact of new technology age will inevitably create more new, different jobs and along with novel work posts, new set of skills will be required. Jobs that require routine manual and thinking skills are giving way to jobs that involve higher levels of knowledge and applied skills like expert thinking and complex communicating(Trilling and Fadel, 2009), which along with other skills as flexibility and adaptability, social and cross-cultural interaction form 21century skills.

Past decade has strongly proven the fact of soft skills importance and influence on the work place then previously perceived. As soft skills and competencies are progressing exponentially with importance and growth in the future period, on the next figure it is shown

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how the demand for top 10 skills is changing, and according to these predictions, soft skill will be in even higher demand than the technical skills.

Today, 2018	Trending, 2022	Declining, 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance and precision
Complex problem-solving	Active learning and learning strategies	Memory, verbal, auditory and spatial abilities
Critical thinking and analysis	Creativity, originality and initiative	Management of financial, material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, originality and initiative	Critical thinking and analysis	Reading, writing, math and active listening
Attention to detail, trustworthiness	Complex problem-solving	Management of personnel
Emotional intelligence	Leadership and social influence	Quality control and safety awareness
Reasoning, problem-solving and ideation	Emotional intelligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving and ideation	Visual, auditory and speech abilities
Coordination and time management	Systems analysis and evaluation	Technology use, monitoring and control

Figure 14:Comparing skills demand, 2018 vs. 2022, top ten (WEF 2018)

What is interesting to note as a trend is that combination of different hard skills, is good to have as an asset. By sole definition of diverse occupations and skills (hard and soft), the person is more likely to have a more creative mind-set, and creativity is one of the highly valued skills to have for the current and future work place. While technical skills are always necessary, new generations are especially interested in building interpersonal skills, confidence and ethical behaviour in Industry 4.0 ('Deloitte Millennial Survey', 2018). Meaning that current and future employees are interested in having diversified skill sets which makes them aware of the added value of interpersonal skills and adaptability they have on the job market. This fact is aligned with the lifelong learning concept mentioned in the first section.

Going back to university entrepreneurial ecosystems, the win-win situation for the educators will be to have an active system that allows students to have the just right balance of soft and technical skills. And sometimes it is not all in the curriculum, novel learning/teaching styles and concepts are more connected to inspiring the lifelong personal growth and learning. Suggesting the HEI are the back bone of knowledge transfers not just as enablers of knowledge, but also as motivators, and in such cases can utilize different tools to transfer knowledge using on-line courses or different kind of collabourations. Collabourations with business, startup sector, enabling hubs or accelerators on the campus, making a vibrant community, not necessarily just for the purpose of creating startups, but also connecting all that aligns with the process, having students in surrounding of learning new entrepreneurial skills.

4.1. Entrepreneurial skills

Today's work market and ecosystems highly value any kind of entrepreneurial experiences a person has. To startup ecosystems, having entrepreneurial skills is a base upon which everything else is built on. In this context, we identify entrepreneurial skills and competencies

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as fundamental to have on todays and future work place, and as such, skills are highly connected to startup development opportunities within high educational institutions.

Entrepreneurship skills are associated with competence in the process of opportunity identification, the ability to capitalize on identified opportunities and a range of skills associated with developing and implementing business plans to enable such opportunities to be realized (BIS Entrepreneurship Skills, 2015).

Within this chapter, entrepreneurship skills will be presented as skills consisted of different subgroups including hard –technical skills, financial, digital and soft skills and competencies.

The purpose of grouping these skills is providing a skills overview of the model for talent acquisition in which entrepreneurial skills framework is one of the components of the model. Second reason is the sole nature of entrepreneurship skills, as interconnected group linking quite diverse skill sets, from soft, 21century skills to competencies and practical technical and financial skills.

4.2. Soft skills and competences

From talent management perspective, skills and competences (with behaviour) make the fundaments of the model. Skills and competencies have similarities but are two different concepts. Skills define specific learned activities, range widely in terms of complexity and can give information on the question "what" an individual possess from the abilities. But skills do not answer "how" does an individual perform a specific task. Competencies provide knowledge by translating skills into practical behaviours that demonstrate the ability to perform the work requirements competently. Competencies incorporate a dynamic combination of abilities, attitudes, and behaviours, as well as knowledge that is fundamental to the use of a skill aligned to a learning outcome. With the concepts of what and how, this model will present the skills and competencies together because two concepts, although different, are very much aligned and usually presented as one set, framework. It is more the question of how to identify and make the best utilization of the 21 century skills and competencies and in this case startup environment, rather than what are the different aspects of the two concepts.

There is growing emphasis in the literature on the importance of 'soft' skills which are now seen not just a complementary to hard skills, but as important as hard, technical skills. The literature and practice also suggest that there is a lack of emphasis placed on the development of soft skills by many tertiary education providers (Hodges and Burchell, 2003).

All aspects considered, there is no doubt in the importance of both, soft and hard skills, when providing a learning environment for defining a talented individual.

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Next figure presents the skills and competence framework developed from the necessities of today's workplace, need of practical knowledge in startups, and literature review on entrepreneurship education of the past period of the development in digital era.

Figure 15: Skills and competencies proposed framework

4.2.1. Creativity

Creativity is the production of novel and useful ideas (Dlugoborskytė, Norvilaitė and Petraitė, 2015) (Amabile 1996). Ideas are formed in various settings and circumstances, in today's digital era creativity is closely linked to entrepreneurship and innovations within new ventures, startups. A recent analysis of entrepreneurship programs showed that 82% of program directors and chairs perceived creativity as important in the entrepreneurship curriculum, and while a majority of the programs sampled offer stand-alone courses in creativity and innovation, in all, 80% of programs required some degree of training in creativity (Schmidt, J. J., Soper, J. C., & Bernaciak, 2013). Creativity allows entrepreneurs to discover and exploit opportunities that enable their firms to be more competitive and innovative (Dromereschi, 2018). Creativity as a skill allows individual to form new constructs and with full consciousness towards the challenges, with creativity, different forms of solutions can be established.

4.2.2. Effective Listening and Communication

Communication is the process of exchanging information and the process of generating and transmitting meanings between two or more individuals. The ability of communication is basic to humans, functioning and well-being (C. Taylor, C. Lillis, 2008). Ability to communicate, transfer information and knowledge has always been one of the most important skills for a person. Through time, the importance of this skill, and all the

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intertwined communication skills as effective listening has not changed, it has become even more important.

4.2.3. Teamwork

Small, self-directed teams are central in agile development (Lindsjørn *et al.*, 2016) and is one of the key principals of organization concepts for IT firms.

Agile development is characterized by collabourative work, which requires multidisciplinary skills, pluralist decision making, high customer involvement, and small teams, while traditional development focuses on individual work, specialized skills, managerial decision making, low customer involvement, and larger teams (Lindsjørn *et al.*, 2016). Even though agile methods emphasize teamwork more than traditional development methods do (Lindsjørn *et al.*, 2016), individuals with high ability to work productively in teams often determine the outcomes of the projects, not just in IT sectors, but in every organization. With the already established shifts from tradition economic principles, shifts in the teamwork also occurred, directly connecting the productivity with more autonomous teams with higher decision-making authorities while making grounds for faster and productive teams.

4.2.4. Problem-solving, experimenting, ideating

Problem-solving is not a novel concept but it this era is viewed from many aspects. (Heppner, P. P., Petersen, 1982) defined the problem solving as the harmony of complicated internal and external motivations and desires for the cognitive and effective behavioural processes. Individual's turning to problem-solving is associated with his or her psychological well-being, courage, motivation and self-confidence (Demirtaş, H. and Dönmez, 2008).

Beside the traditional way of understanding and implementing problem-solving skill, with lean methodology, Problem solving skill got a new dimension, combined with experimenting and ideation phases. Design, development, and feedback loops ensure the experimentation flow. In this way, problem solving is the first step, continued with experimentation and ideation. The experiment in this process is seen as a way to focus on continues discovery and improvement of value chain, any value chain in the industry. To experiment is to try out and often connect different points of the process and get the output. Output is not necessarily a product or service, it can easily be even an idea, algorithm or program. The skill of experimentation ensures the freedom and ability to put different models, technological ideas, programs beside one another and test them out.

In this way problem solving represent one of the crucial skills for today entrepreneurs. Not just entrepreneurs, but all employees dealing with different kind of problems and solution with all kinds of experiments, feedbacks and ideation for creating enhanced or new product/services.

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4.2.5. Leadership

Leadership is a skill which usually determines the outcome of strategic decisions. Authentic leadership builds upon and promotes positive psychological capacities and a constructive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency between leaders and followers (Gardner *et al.*, 2008). One more very important aspect is the influence a leadership has on internal culture of organizations. It is up to top management that uses the leadership skills to properly set the culture of the organizations they are leading. Culture should be built from within including all employees – teams to create the valuable culture, but it is up to management to promotes positive culture.

4.2.6. Adaptability/Flexibility

Adaptability and flexibility are about creativity. It's being open to other alternatives in any situation. It's about looking for the second or third "right" answer (Whitehead, 2018).

Flexibility as a skill includes the willingness and ability to respond to changing circumstances and expectations. Being flexible when it comes to work is worth a lot especially in startup world where uncertainty is at its peak, and thing are changing hourly. The response in disruption should be flexible, because it is a huge probability the construct will change again. In each filed flexibility is a plus, from product-customer value chain, to team flexibility and agility.

Adaptability along with flexibility has become intensively important especially since during the work process impact of uncertainty is change and visible more than ever. To quickly adapt to the new situation on the market, technology, with client, or with colleagues it is crucial to use the right mix of time management, change and flexibility skills, which makes the adaptability one of future highly valuable soft/21 century skills.

4.2.7. Business Awareness

Business Awareness is a skill, but it can also be presented as the concept, way of thinking. Awareness represents the possibility of opportunities, and even more important using the opportunity. Business awareness can include many other skills as project management, commercial awareness, analytical skills, selling and marketing skills but for the purpose of the model, business awareness will be identified as an opportunity-based concept in startup ecosystem.

4.2.8. Confidence

In order to develop a new project, e, or just set out to be part of a new environment, a person needs confidence. Confidence is the ability to trust yourself to have the ability to ultimately

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achieve goals that were set. Intertwining with self-awareness, consciousness and trust, confidence represents a very complex and valuable skill for entrepreneurs.

4.2.9. Ecosystem thinking

In order to create a product or service that can be of value to the whole community, environment, an individual most go beyond customer need. Newly designed products are solving a problem on many levels. The starting point of new product design will probably be connected to customer needs, but as ideas develop, entrepreneurs make consciousness actions considering all stakeholders in the system including environmental, cultural factors for a more meaningful outcome.

4.2.10. Public speaking

Public speaking as a skill is highly valuated in not just entrepreneurial context, but in most work-related activities with different stakeholders. Public speaking, as part of communication skills, is used to present and inform audience, motivate, and finally engage audience in productive conversations.

4.2.11. Self-awareness

Self-awareness, as a concept, is one of five components of emotional intelligence. But looking at a concept of self-awareness through the lens of skills development in talent acquisition, this skill represents ability to understand emotions, feeling, behaviours and make continues self-improvement. Therefore, self-awareness enhances context of self-improvement and constant, lifelong learning, both much needed in talent development.

4.2.12. Empathy

Also, a component of Emotional intelligence, but an extremely important skill for entrepreneurial setting. Empathic person has an ability to understand people in an environment and properly react to emotions. But the segment of understanding is very important for the initial phase of startup idea development. Many different tools derived from empathy constructs are used in the first idea explorations (as Empathy Map, Personas, Value Proposition etc.) in which all the focus is the ability to understand customers, needs, environment and based on these insights solve a problem.

4.2.13. Motivation

A skill that represents an initial drive not just for a person, but also for all connected people working on the same project, business. Importance of motivation can be seen in all phases of projects, from begging till end. To be able to motivate is the skill that can make an instant change in the culture of the business.

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4.2.14. Stress tolerance

When opening a startup and working in an entrepreneurial culture, some constants are quite visible, one of them is stress. Stress is usually connected to fast change of the environment, market, different, team, culture and in the Industry 4.0. movements, especially new technologies. In order to be more aware and less stress, stress tolerance is a skill much needed in the entrepreneurial context. Stress tolerance is even more important for the young entrepreneurs, because they are just at the begging and it's probably the first time, they will encounter this kind of stress. A more experienced businessmen have already dealt with stressful situations and have trained themselves to preserve themselves from all the negative implications of stress. But young entrepreneurs usually do not have the experience, nor that much time to make fast and rightful decision. Therefore, stress tolerance and the mechanisms of how to deal with stress are very important to the young entrepreneurs.

4.3. Digital skills

Digital technologies now underpin effective participation across many aspects of everyday life and work. In addition to technology access, the skills and competencies needed to make use of digital technology and benefit from its growing power and functionality have never been more essential (UNESCO, 2017). Communication in digital era is hardly done without the use of digital channels. In this kind of digital environment and 21 century demand for different kind of skill set, digital skills and competencies are introduced as a result of use different technologies in various context. What skills an individual need will depend on their work, sector, level of education, career trajectory, and a lot of other factors. One set of competencies is not appropriate for all environments and individuals. To be specific, the same digital skills won't be the same for a programmer and a sales person. It is possible to identify generic digital skills for a diverse set of people, but for the purpose of this tool, identification of digital skills was more focused on digital skills matching work environment demand and university settings. NESTA[19] has given an overview of different types of digital skills frameworks for different sectors and specifically for education sector, the suggestion was the framework - Digital Capabilities by JISC - designed to be 'used by staff in any role and by students in any educational setting'.

[19] https://www.nesta.org.uk/blog/four-steps-to-define-digital-skills/

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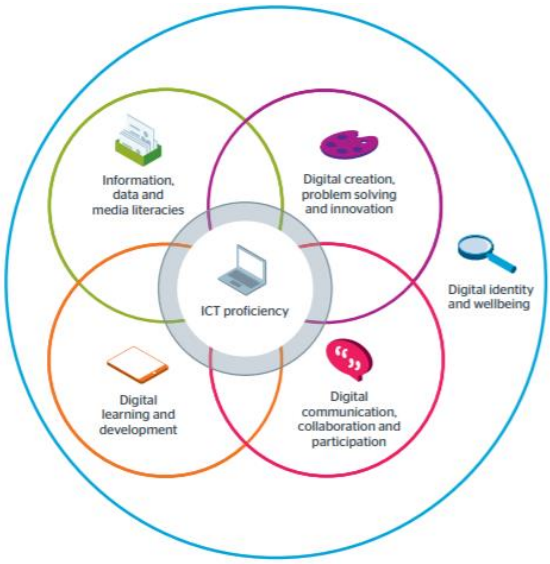

Figure 16: Digital Capabilities JISC Framework

Framework clusters digital capabilities into six broad elements and one of the ways for using the framework, noted by authors, is to plan or review staff/educational development. For example, ensuring that framework elements are included in professional development activities for teaching staff and through curriculum of the courses

Pearson and Nesta have made a research on Future of Skills for 2030[20], based on a novel methodology for predicting the demand for work and skills in the US and UK economies in 2030. This methodology combines the expertise of humans with the power of machine learning. In addition, the skills, knowledge types, and abilities that will be most likely experience growth and decline are identified in the research. According to this research, identified skills, knowledge types and abilities in demand for the future work are:

Learning Strategies	**Education and Training**	**Therapy and Counselling**	**Complex Problem Solving**
Psychology	Coordination	Philosophy and Theology	Oral Expression
Instructing	Originality	Speaking	Communications and Media
Social Perceptiveness	Fluency of Ideas	Service Orientation	Speech Clarity
Sociology and Anthropology	Active Learning	Active Listening	Judgment and Decision Making

Figure 17: The future of Skills 2030 - Skills, knowledge types, and abilities listing (Pearson 2017)

[20] https://futureskills.pearson.com/research/

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The top-rated skills show a multidisciplinary subject leaning more towards the combination of psychology aspects, soft skills and technology orientations. From this report we can also identify the trend of digital and soft skills importance in predictions for the future of work.

4.4. Technical skills

Hard skills are defined as technical skills, usually connected to programs or any kind of industry/machine work that can be considered as use of different kind of tools, programs, machines aligned with technical knowledge. Hard skills are also described as the specific knowledge and abilities required by a workplace.

In order to get the most relevant technical skills demanded on the market, a research was conducted on the most resourceful platforms for today's work recruiting and learning platforms as GitHub, Linux, LinkedIn and Udemy academy's.

Source	Udemy platform[21]	learntocodewith.me[22]	GitHub[23]	Hired.com
Base of classification	*Analysed patterns of users for the most demanded skills/program s*	*Skills grouped in tech themes*	*Skills, and themes grouped by project types most worked on in 2017.*	*Classified top IT skills based on best payed posts (Salary Report)*
	Apache kafka (integration of data to understand consumer behaviour	Machine Learning and AI	Cross-platform Development	JavaScript
	Graph QL (improving mobile app performance)	Mobile Development	Development	Java
	Chef Software (automation of It infrastructure on cloud)	SEO/SEM Marketing	Containerization	Python
	GNS 3 (design of complex network typologies)	Data visualization	Machine Learning	HTML
	Kubernetes (automation and development of apps)	Data Engineering	New skills	CSS
	AWS (Cloud Computing)	UI/UX Design	Design	
	LPIC (Multilevel Linux professional certification program)	Cybersecurity		
	Splunk (Machine data analysis for security challenges)	Amazon web services/Cloud Computing		

[21] https://business.udemy.com/blog/10-hot-it-skills-2018/
[22] https://learntocodewith.me/posts/tech-skills-in-demand/
[23] https://blog.github.com/2018-02-08-open-source-project-trends-for-2018/#new-skills

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	Microsoft Azure (Cloud Computing)			

Figure 18: Review of learning platforms for the most demanded skills/programs

LinkedIn[24] made even more detailed presentation on todays most wanted occupation and technical skills needed. The occupations are mainly from ICT sector, but also include Marketing, Management, Design and Business Intelligence fields.

Cloud and distributed computing	Platform Engineer, Cloud Architect		Data engineering and data warehousing	Software Engineer, Database Developer, Data Analyst
Statistical analysis and data mining	Business Analyst, Data Analyst, Statistician		Storage systems and management	Database Administrator, System Administrator
Middleware and integration software	IT Manager, Systems Integration Engineer		Electronic and electrical engineering	Electrical Engineer, Electronic Engineer
Web Architecture and development framework	Web Developer, Full Stack Web Developer		Algorithm design	Software Engineer, Lead Software Engineer, Lead Developer
User interface design	UX Designer, Web Developer, UI Designer		Perl/Python/Ruby	Software Engineer, Data Scientist
Software revision control systems	Web Developer, Software Programmer		Shell scripting languages	Linux System Administrator, System Engineer, Java Developer
Data presentation	Graphic Designer, Data Scientist, Business Consultant		Mac, Linux and Unix Systems	System Administrator, Linux System Administrator
SEO/SEM marketing	Marketing Specialist, Online Marketing Manager, Advertising Manager		Java development	Java Developer, Web Developer
Mobile development	Mobile Engineer, Mobile Application Developer		Business intelligence	Business Intelligence Analyst, Forecast Analyst
Network and Information Security	Information Security Specialist, Cyber Security Specialist		Software QA and user testing	User Experience Engineer, Software Test Engineer, Quality Assurance Engineer
Marketing campaign management	Online Marketing Manager, Digital Marketing Specialist,		Virtualization	Network Engineer, Network Administrator

[24] https://blog.linkedin.com/2018/january/11/linkedin-data-reveals-the-most-promising-jobs-and-in-demand-skills-2018

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	Digital Marketing Manager			
Automotive services, parts and design	Vehicle Engineer, Industrial Designer		Economics, Database Management and Software	Business Development Manager, Auditor, Research Analyst, Database Specialist and Administrator

Figure 19: Review of the most needed occupation and technical skills by LinkedIn for 2018

Reviewing the demand on hard skills based on the information from the platforms and other resources, demand for hard skills dominates in the occupations mainly from Computer Science, ICT sector, but also include Marketing, Management, Design and Business Intelligence fields. Identified skills also announce the future demand and growth of interconnectivity between skills of different types of technology, for example connecting ICT skills with Electrical Engineering.

One more important note is the interconnectivity between the soft and hard skills presented from mostly all researcher on this matter. Soft and hard skills are combined as one necessity of equal importance for future work posts in all industries, from startup to corporate.

4.5. Financial skills

Financing literacy is listed as one of the critical managerial competencies in SMEs firm and development (Spinelli, S., Timmons, J. A., & Adams, 2011). Financial literacy can be also defined on personal level, meaning the individual literacy is important determination of managerial competencies and overall development. From this aspect, financial literacy and skills connected to developing financial construction of startups are weighted as highly important skills from the start of founding process.

Moreover, in more developed stages of startup and need of funding, research from (Dieckhöner, 2015) has shown that new entrepreneurs with good financial knowledge get into financing difficulty far less (17%) than those with poor financial knowledge (24%).

Within this model, financial skills have been presented from the basic needed skills of founding a first startup. Since the model will be introduced to student community of various background, the intent was to explore first the basic financial knowledge needed for the first stage of startup, as usually incubators, mentoring and entrepreneurship programs offer on the Universities. Through the model, students were asked to rank their knowing on the following subjects, creating a budget for specific project, creating and analysing cash flow,

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sales forecasting, breakeven analysis, Profit & Loss Analysis and Sources and uses of investment funds.

4.6. Future employment occupation trends

In order to fully adapt to new market with startup ideas, creation of new job roles or adjusting current roles in the market, we need to look at the future prediction and make deeper understanding what will be next skill set needed for new age occupation and roles. Businesses, ecosystems, educators and individuals have much to gain from deeper understanding of the new labour market and proactive preparation for the changes underway.

Key factors to consider include mapping the scale of occupational changes and documenting emerging and declining job types, highlighting opportunities in use of new technologies to augment human work and upgrade job quality, tracking the evolution of all job-relevant skills, and, finally, documenting the business case for investment in retraining, upskilling and workforce transformation[25].

On the next figure the example of three categories of roles is presented for the period 2018-2022.

Stable Roles	New Roles	Redundant Roles
Managing Directors and Chief Executives	Data Analysts and Scientists*	Data Entry Clerks
General and Operations Managers*	AI and Machine Learning Specialists	Accounting, Bookkeeping and Payroll Clerks
Software and Applications Developers and Analysts*	General and Operations Managers*	Administrative and Executive Secretaries
Data Analysts and Scientists*	Big Data Specialists	Assembly and Factory Workers
Sales and Marketing Professionals*	Digital Transformation Specialists	Client Information and Customer Service Workers*
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Sales and Marketing Professionals*	Business Services and Administration Managers
Human Resources Specialists	New Technology Specialists	Accountants and Auditors
Financial and Investment Advisers	Organizational Development Specialists*	Material-Recording and Stock-Keeping Clerks
Database and Network Professionals	Software and Applications Developers and Analysts*	General and Operations Managers*
Supply Chain and Logistics Specialists	Information Technology Services	Postal Service Clerks
Risk Management Specialists	Process Automation Specialists	Financial Analysts
Information Security Analysts*	Innovation Professionals	Cashiers and Ticket Clerks
Management and Organization Analysts	Information Security Analysts*	Mechanics and Machinery Repairers
Electrotechnology Engineers	Ecommerce and Social Media Specialists	Telemarketers
Organizational Development Specialists*	User Experience and Human-Machine Interaction Designers	Electronics and Telecommunications Installers and Repairers
Chemical Processing Plant Operators	Training and Development Specialists	Bank Tellers and Related Clerks
University and Higher Education Teachers	Robotics Specialists and Engineers	Car, Van and Motorcycle Drivers
Compliance Officers	People and Culture Specialists	Sales and Purchasing Agents and Brokers
Energy and Petroleum Engineers	Client Information and Customer Service Workers*	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers
Robotics Specialists and Engineers	Service and Solutions Designers	Statistical, Finance and Insurance Clerks
Petroleum and Natural Gas Refining Plant Operators	Digital Marketing and Strategy Specialists	Lawyers

Figure 20: Examples of stable, new and redundant roles, all industries, 2018-2022 (WEF)

[25] WEF Future Jobs Report 2018

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*Note: Roles marked with * appear across multiple columns. This reflects the fact that they might be seeing stable or declining demand across one industry but be in demand in another.*

Roles that are set to experience increased demand are significantly based on and enhanced by the use of technology, such as Data Analysts and Scientists, Software and Applications Developers, and Ecommerce and Social Media Specialists. Also, roles which are expected to grow are the ones leveraging distinctive 'human' skills such as Customer Service Workers, Sales and Marketing Professionals, Training and Development, People and Culture, and Organizational Development Specialists as well as Innovation Managers.

Analysis finds extensive evidence of accelerating demand for a variety of whole new specialist roles related to understanding and leveraging the latest emerging technologies: AI and Machine Learning Specialists, Big Data Specialists, Process Automation Experts, Information Security Analysts, User Experience and Human-Machine Interaction, Designers, Robotics Engineers and Blockchain Specialists.

From the categories of stable and new roles, the indications for further development are in following sectors: Digital businesses and E-commerce, AI and Machine Learning, Financial Services, Innovations, Robotics, Information technologies, Engineering and Automation, IT Security and Data Analytics. Businesses or startup ecosystems which enable the development of specific set of skills for the indicated sectors, could directly be of benefit to its users/students equipping them with the right skills and knowledge for the roles.

From new skills development perspective, it is important to note the fact of future skills transferring is appearing much faster in individual's development and not just from one traditional source (Schools and Universities) but also with more online, virtual interaction and initiatives provided by various complex online and offline communities and peer to peer sharing.

4.7. Future work posts prediction for Slovenia, Czech Republic and Romania according to the European Skills Index (ESI)

Future work place will require different skills sets and activities within the work posts. Work place panorama of different sectors in the next period will be changed and different occupations will take priorities in labour sector. Economies in the countries will adapt (with their one pace) to different trends but never the less, sectors of labour and work posts for the future generations will be changed notably from country to country. As part of this section of forecasting future work places and connecting future labour market with needed skills and talents, **European Skills Index** will be consulted**.** The European Skills Index (ESI) is Cedefop's

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composite indicator measuring the performance of EU skills systems and using ESI data overview of future labour forecast will be demonstrated for Czech Republic, Slovenia and Romania.

4.6.1. The Czech Republic

The Czech Republic economy and labour market performed remarkably well in recent years, maintaining strong GDP growth and reaching lowest unemployment rate in the EU.

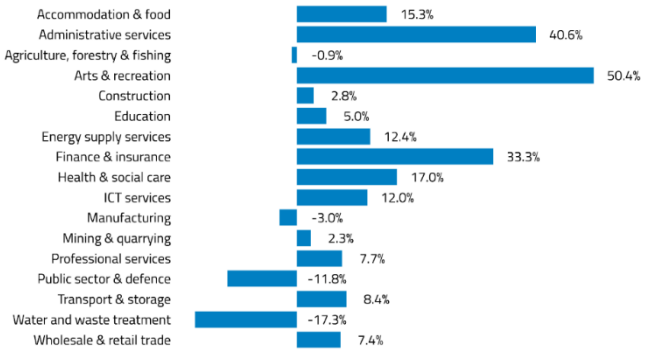

Figure 21: Future employment growth (in %) in Czech Republic in 2016-2030 across sectors

Manufacturing industry remains the backbone of the country's economy, employing more than quarter of its workforce (more than three following sectors - wholesale & retail trade, construction and health & social care combined).

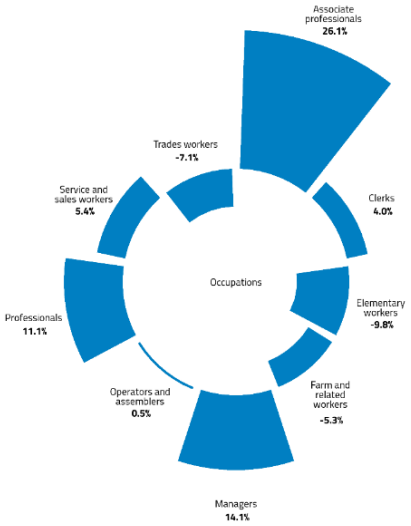

Figure 22: Future employment growth (% change) across occupations in Czech Republic in 2016-2030

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However, share of young people on working age population is diminishing rapidly, signalling future problems. The increase of working age population will be low in Czech Republic in next years, although total employment should still grow.

With already very strong manufacturing, most new job opportunities will come from services, namely arts & recreation or administrative & support services. Unsurprisingly, medium-level qualifications will be required for majority of total job openings (included those designated to refill vacated jobs). The share of total job openings requiring low qualifications in the Czech Republic is the smallest in the EU with 3.7% (ESI 2018).

According to ESI Index, three sectors with the highest growth of future employment in Czech Republic will be Arts and Recreation, Administrative services and Finance and Insurance. Occupations and the needed skills for the future work post openings will be occupied by science and engineering technicians, legal and social associate and office associates. Negative trend change will influence Elementary workers and Farm and related workers.

4.6.2. Slovenia

Since the financial crisis in 2008, Slovenian economy has experienced periods of growth and decline. During the period of 2011-2016 the country's employment declined, but its unemployment rate now stands below the EU average. An improvement is expected over the period to 2030. Employment shall increase, driven by arts & recreation, ICT services and country's most important sector – manufacturing, which creates one quarter of jobs in the economy.

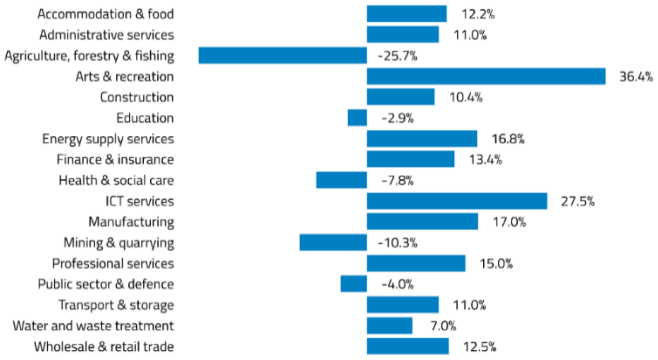

Figure 23: Future employment growth (in %) in Slovenia in 2016-2030 across sectors

The fastest growing occupations will be office associate professionals and researchers & engineers. But the country's labour market also shows signs of polarization – both high- and low skilled occupations are expected to grow in the future, while medium skilled occupations should either stagnate or decline.

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Three of the fastest growing sectors in Slovenia will be Arts and recreation, ICT Services and Manufacturing.

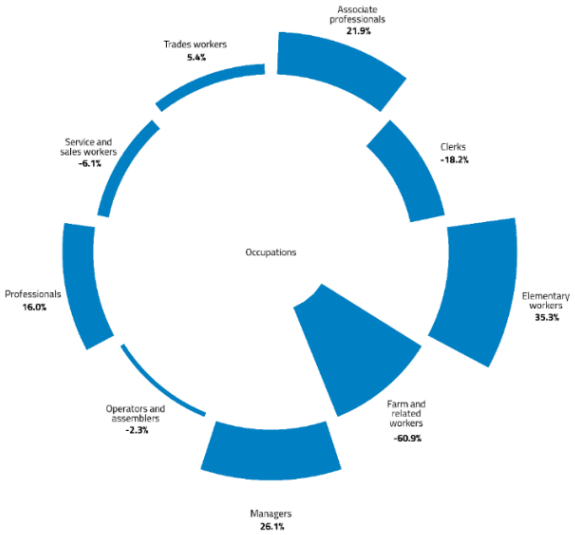

Figure 24: Future employment growth (% change) across occupations in Slovenia in 2016-2030

Occupations and the needed skills for the future work post openings will be occupied by office associate professionals, researchers and engineers, and agricultural labourers. Negative trend change will influence Farm and related workers in a significant amount. Clerks, service and service and sales workers will also be negatively influenced but in a fairly smaller percentage.

4.6.3. Romania

Romania has experienced a fall in the number of wage-earning employees since the beginning of the century.

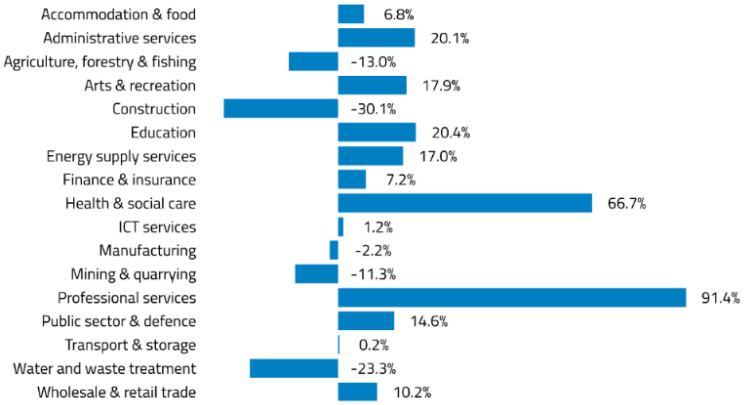

Figure 25: Future employment growth (in %) in Romania in 2016-2030 across sectors

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This has been explained with reference to high rates of inactivity recorded by the working-age population (15-64), the large number of people working in subsistence farming, and the outward migration of labour (mostly to elsewhere in the EU), bringing about a loss of human capital.

Similarly, the extent of early school leaving also has affected the competitiveness of Romania's workforce. Looking to the future, there will be modest employment growth, but employment levels in 2030 are expected to remain below their pre-2008 crisis levels. Most employment growth will be in professional services, health & social care and education sectors. Most new job opportunities will be for agricultural workers and legal & social professionals. When it comes to total job openings (including replacements for vacated jobs), Romania will need similar shares of people with all qualification levels over the period to 2030.

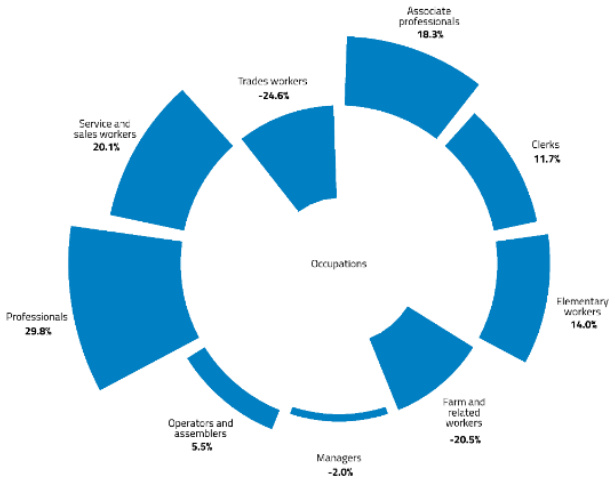

Figure 26 : Future employment growth (% change) across occupations in Romania 2016-2030

Although the total demand for people with low qualifications will be smallest, it will still represent one in every four job openings – third highest share in the EU.

Occupations and the needed skills for the future work post openings will be occupied by Professionals, Service and sales workers and Associate professionals. Negative trend change will significantly influence Trade workers and Farm and related workers.

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5. Online learning platforms and technology trends

5.1. Online learning platforms

Community platforms, online courses, online peer-to-peer learning is setting its role as a new, constant way of learning. While analysing different frameworks proposed by authors and organizations in previous chapter, we can find consistencies and highlight the factors important for the university entrepreneurial framework from the ecosystem/entrepreneurial environment point of view. One of the perceived consistencies is different combinations of online learning and tools (from platforms to forums) used by students, researchers, founders in order to develop and first off, all receive knowledge. Over the past few years, the practices of e-learning have undergone a number of initiatives, particularly with regard to the openness of the learning environment (Hew and Cheung, 2014). Even if we just take the curriculum side of today courses, we can notice how significant amount of knowledge is being transferred through online tools and platforms. Online learning or e-learning is a massive market and global E-Learning market will reach $325 billion by 2025[26]. This fact signals the investment in e-learning many organizations will be willing to take and online learning will scale its impact on all interested in online knowledge.

Within this model, the focus was more on open-source learning available on different platforms, as it is used by Universities and by students. The intent of Model research was to identify the most frequent resources students use either to get new knowledge or supplement the received on compulsory courses.

Considering the technology, trends implicate high development of online communities, platforms and different kind of points for shared knowledge (from YouTube channels, to MOOC and online courses on platforms as Udemy, edX etc.). It is proposed within this model to include digital learning platforms, communities and different forms of online learning courses to be an active part of the model, as an added factor of gaining knowledge on entrepreneurial universities. In this way, the students were asked to identify the online learning platform tolls, channels, forums they use and how frequent is the usage of online individual learning.

New trends of sharing and transferring knowledge with all the relevant subjects are existent on the platforms, free of charge. Courses can be a start point, or an addition for learning the

[26] https://www.forbes.com/sites/tjmccue/2018/07/31/e-learning-climbing-to-325-billion-by-2025-uf-canvas-absorb-schoology-moodle/#1008f9483b39

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new skills, selecting the pace the individual is comfortable with. The advantages the online platforms are offering look very interesting for today's market, from every aspect we look at it. From curriculum, to making your own business, online community can be an answer, or considered as a free, optional part of an answer for technology and entrepreneurial trends learning.

5.2. Technology Trends

Internet, mobile technologies, artificial intelligence, big data, robotics, nanotechnology, and other disruptive technological phenomena are potentially causing profound changes in organizations and society (Brem and Voigt, 2009). The phenomenon of disruptive technology trends is getting even more developed introducing new trends on a yearly basis. From this point, it is crucial to look at new technology development and connect new tech with startup ecosystems. The fact is inevitable that future startups made either on University ground or any other incubator or accelerator will include some point of new technology in their value proposition of the business.

In the WEF Report for Future of Jobs, a projection is made for the technologies that companies are likely to adopt by 2022. The list of technologies is presented in the next figure:

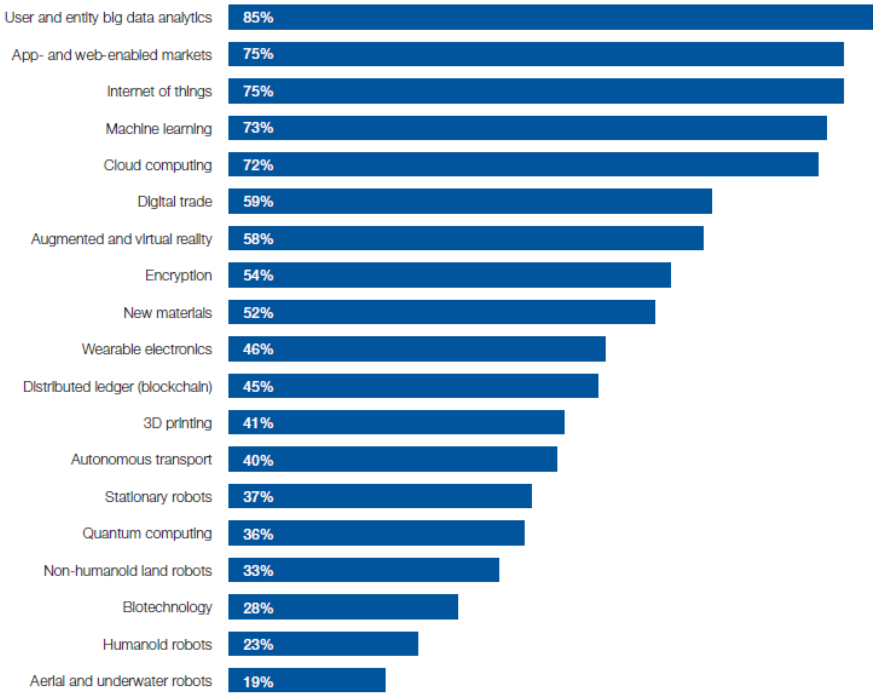

Figure 27: Technology trends, Future of jobs 2022 (WEF)

According to the global employers surveyed for this report, four specific technological advances will lead the new tech era, high-speed mobile internet, artificial intelligence,

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widespread adoption of big data analytics and cloud technology as drivers positively affecting business growth.

Following this prediction, skilled talent will need to learn or create different kind of skills for entering the job and business market. It is essential that future talent has a strong knowledge basis for the new technology, because new technologies can drive business growth, job creation and demand for specialist skills but they can also displace entire roles when certain tasks become obsolete or automated (World Economic Forum, 2018a).

Preparing the future talent with right set of skills can solve two emerging problems, skill gaps—both among workers and among the leadership of organizations. With new skill knowledge - problem solving on all levels will be easier, form creating new services to understanding how technology can speed up growth and trends towards automation in many fields.

While creating this talent model several interviews with IT specialists working in startups and companies (in Lisbon area) were conducted. The main goal of interviews was to determine skills and technologies practitioners are using currently, and participators were also asked to give their view on emergence of skills and technology needed for the future. Based on the literature resources and interviews made with practitioner, questions in domain of business awareness, skills and technology trends were established for the Survey of this Talent Model.

6. Talent Acquisition Model Design

For the purpose of developing the talent acquisition model in university setting focused on startup culture and skills, through the chapters above the key pillars of the model have been presented. In order to fully recognize all stakeholders involved with University setting, the talent model is presented with key stakeholders as influencers of the talent development. Some with higher impact than others, but it is important to note all the stakeholders in the model because the worldwide combinations for making a successful university entrepreneurial cultures are different from country to country. In some cases, local authorities can have an important role at the start of making accelerators needed for university environment by investing and supporting the accelerator through funds, connections and space availability (Faculty of Science and Technology, University NOVA Lisboa, has MADAN Parque, an incubator and research Centre available for students, researchers and professors in campus[27]).

[27] The example refferenced from 4.1 Best Practices deliverable

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Entrepreneurship as a subject is usually based in curriculum of faculties, since it is a high probability to have Entrepreneurship (or courses similar with the subject of economics, business etc.) as a course during the studies. Adding on to this concept, there are many other inputs within the curriculum and faculty activities that can further develop entrepreneurial mind-set and skills to students (from special courses to events). Facilities within the campus that can serve as a one-stop-shop for idea development are also an import factor identified in many cases.

The development of skills and competencies also happens during connected entrepreneurial activities such as hackathons, pitching events and different programs for startup development. All the events/programs with startup and entrepreneurial context usually offer opportunities for learning soft, technical and financial skills with practical, hands-on experience.

It is important to identify the entrepreneurial skills as a sum of soft and hard/technical skills combined with digital and financial skills. These skills can make a significant impact towards creation of 21 century skills framework for entrepreneurship and startup development.

Why aim for 21 century skills, because having in mind the trends of the future digital age, more interconnected skills are emerging as important and necessary. To be able to think with complexity, have different social skills and innovate with fluency of ideas, will be highly demanded in startup world, industry seating or any future work place. All students probably won't be a startup founders but having entrepreneurial mind-set and developing skills needed for the future workplace is an inevitable fact of every personal growth, not just in university setting but generally.

That being said, the learning curves are changing as well. Contextually speaking, knowledge is now available online more the ever in history of learning opportunities. Online learning platforms are providing substantial bases of different subjects/knowledge, including entrepreneurship, digital trends, specific programs and other themes. For this reason, online learning platforms, community platforms, forums are also considered to be part of the Model as providers of easy, cost free, available knowledge. During the research on online learning platforms, it is also noted that most of the leading platforms are up do date with all themes and important subjects in today's market. The courses on different kind of startup development themes, blockchain, AI, internet of things, industry 4.0 are indeed available to learn on the platforms as Edx, Coursera, Udemy, Lynda (LinkedIn) and others.

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Figure 28: MY-GATEWAY Talent Acquisition Model for Universities

With all mentioned pillars, talent model is created to provide inputs of entrepreneurial ecosystem, environment, business opportunities, skills and online learning platforms from the perspective of the students.

6.1. Research design

Based on the literature review and industry findings, research will be focused on the parts of talent model acquisition presented in the following table along with chapter points in the Talent Acquisition Model, and output sections of the Model.

Name of the component	Chapters in the Document	Outputs	Questions reference in the Survey
Understanding of startup ecosystem opportunities (from facilities to idea development)	2,3	Awareness of entrepreneurial	6,10
Understanding of individual opportunities, business awareness, and motivations for founding a startup	2,3,4	Awareness of entrepreneurial opportunities Motivation towards entrepreneurship	7,8,9,11
Entrepreneurial skills and competencies development (soft, technical, digital and financial)	4	Skills	12,13,14
Future technologies trend awareness and Utilization (with frequency) of online learning platforms	4,5	Usage of external resources	15,16,17

Figure 29: Talent Acquisition Model Components

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Research was designed referencing framework of Entrepreneurial University Framework of (Ghina, Simatupang and Gustomo, 2015) stating out the important roles of institution and access to different entrepreneurial context in the entire university Ecosystem. The framework gave basis to research in the subjects of possible startup/business awareness in the University, quality of different kind of entrepreneurial services and individual motivation towards founding or working in a startup.

This research has combined the findings and concepts of previous frameworks and added more components within the scope of research. Following this model, skills framework of the Talent model was designed with the reference of current market needs of skills and abilities (from industries to workplace referencing report findings, articles and practitioners experience) while connecting the future needs and demands within entrepreneurial and work sector of CEE Countries and global trends.

Usage of external resources as the last component of the research has a goal to explore frequency and different source of on-line learning bases students use.

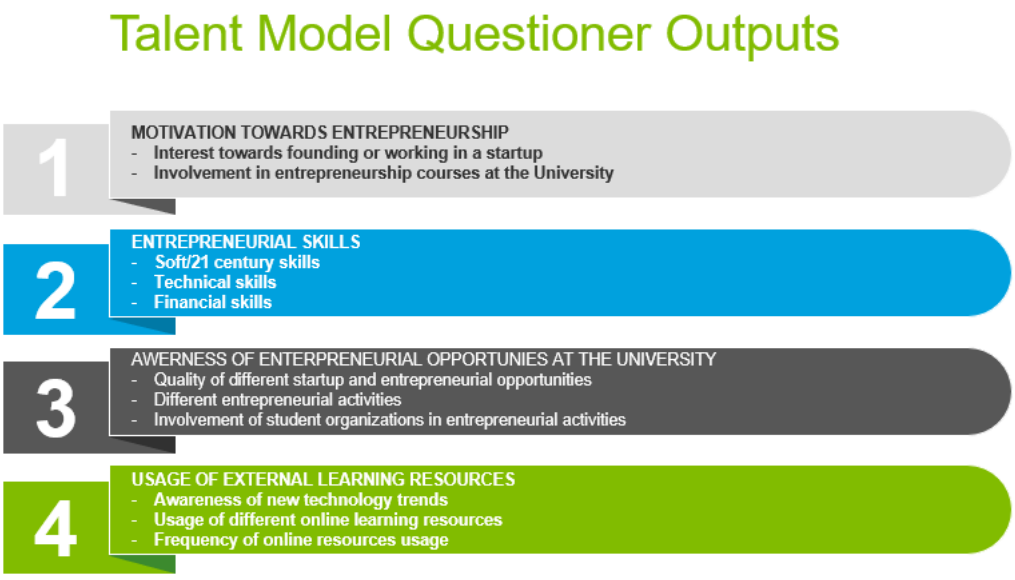

Figure 30: Talent Model Survey Outputs

From the information obtained through the research and literature work, Survey was created in order to exam the ecosystem, skills, courses, environment, motivations and startup aspirations of the students in CEE universities. To make the full understanding of the startup ecosystems, students were asked to give their positions on the mentioned subjects and this way the Model can identify the following outputs from student's perspective on university startup ecosystem.

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The outputs of the model correspond the outputs of the Survey components and have been categorized in 4 groups as presented on the TM Output Model scheme. Grouping the outputs was designed in order to show the current situation from student's aspects of different entrepreneurial components in the University. The four categories are Motivation, Business opportunities, Skills and Usage of external Resources.

6.2. Survey Design

The Survey consisted of Likert-type scale questions, multiple choice questions and several demographic questions. In regard to skills section, the skills and competency questions framework were adapted from (Rainsbury et al., 2002). The data for new technologies introduced in the survey were adapted from WEF Future of Jobs report (World Economic Forum, 2018) and the data for technical skills a research was conducted on the most resourceful platforms for today's work recruiting and learning platforms as LinkedIn[28], Udemy platform[29], learntocodewith.me[30], GitHub[31] and Hired.com

The Survey was designed with 15 questions (from 4 output groups). The first section of the Survey consisted of general demographic items. These included genders, age, University, field of study and type of study.

Second section consisted of multiple-choice questions and some questions had 5 level optioning in order to allow the student to give more focused feedback on the asked context of the Question.

Section Three of the survey consisted of 3 groups of Likert-type items designed to assess students' overall confidence on three group of skills, soft, technical and financial. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they agreed with each skill and ability.

Section four included question of Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last section included multiple choice question on frequency of external resources usage and different types of on-line learning platforms. The Survey was disseminated via google forms open source and total time needed for participation was from 7 to 10 minutes.

[28] https://blog.linkedin.com/2018/january/11/linkedin-data-reveals-the-most-promising-jobs-and-in-demand-skills-2018

[29] https://business.udemy.com/blog/10-hot-it-skills-2018/

[30] https://learntocodewith.me/posts/tech-skills-in-demand/

[31] https://blog.github.com/2018-02-08-open-source-project-trends-for-2018/#new-skills

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6.3. Data Collection Methodology

Data was collected from 9 Universities from Romania, Czech Republic, Slovenia, Spain, Portugal and Israel.

The goal of the Survey was to show current situation and different stages of strengths or needed upgrades from different entrepreneurial/startup University context. The data was analysed in order to get summed averages weighted by the scale from 1 to 5.

The questions were created to give clear distinction of every answer (from 5 being the best option and 1 being the least favourable option), the data could be analysed by taking the weighed averaged sum of each question.

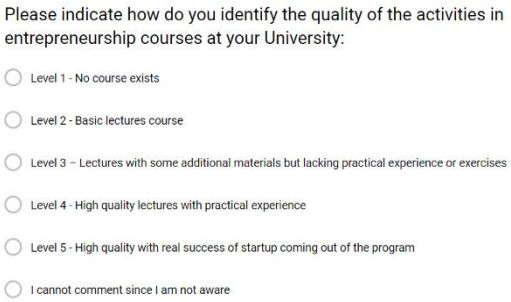

Figure 31: Example of one Question from the Survey

Some questions were also given an option "I cannot comment since I am not aware" for two reasons. First reason was to reduce uninformed response, since it assures respondents that they need not feel compelled to answer every Survey item, especially the one that they are not familiar with. Secondly, if the mentioned activities exist and students are not aware of it, this signals a unawareness of the activities, which can serve as information for the University as well. The response rate of University is shown on the next table:

Name of the University	Country	Number of responses
University of Economics Prague	Czech Republic	170
University of Maribor	Slovenia	53
Babes-Bolyai University (UBB)	Romania	132
Technic University (UTCN)	Romania	64
West University of Timisoara (UVT)	Romania	104
"Alexandru Ioan Cuza" University (UAIC)	Romania	240
University of Salamanca	Spain	49
University of NOVA Lisboa	Portugal	66
University of Bar-Ilan	Israel	35

Figure 32: University responds rate

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Each University data was processed and analysed with the same method. At the end, with summed weighted data, outputs of 4 categories of Talent Model could be used to compare Universities based on the same points. With all four categories of output (Motivation, Business opportunities, Skills and Usage of external Resources.) a "Scoreboard" of Talent Model was developed for each University giving information on the all point of categories based on the student's perception of entrepreneurial availabilities and resources on the campus. The Scoreboards documents were sent to every Universities that participated in the research, along with the method analysis of the Scoreboard and identified results from the research.

6.4. Limitations

For the purpose of this analysis in which the model needed to deliver average results, the statistical method used was Mean score and can pose a limitation. The average values were used to identify the main points of all components, although the answers were weighted on 1 to 5 scale. Another limitation is the participants number per University which is different and varies from 35 to 240 responses, but for the purposes of this model and time constrains of the research, all results over 35 were analysed. Establishing a successful entrepreneurial university ecosystem requires collaboration and contribution from all stakeholders within and outside university (Greene PG, 2010) and the aim of this research was to better understand different entrepreneurial ecosystems in Universities and countries, from the students perspective in order to have input for further enhancement of talent development.

7.Talent Model University Survey Results

Each University with over 35 responses has been analysed and compared by the four outputs.

The next figure presents results of Universities with all main scores of the outputs for main categories (outputs) and sub-categories.

Detailed results will be presented by country and by University with The Scoreboard and detailed analysis of each University.

After the analysis, best practices from partner organizations (including MY-WAY project best practices) have been presented and further distributed to the Universities in the area of university entrepreneurship.

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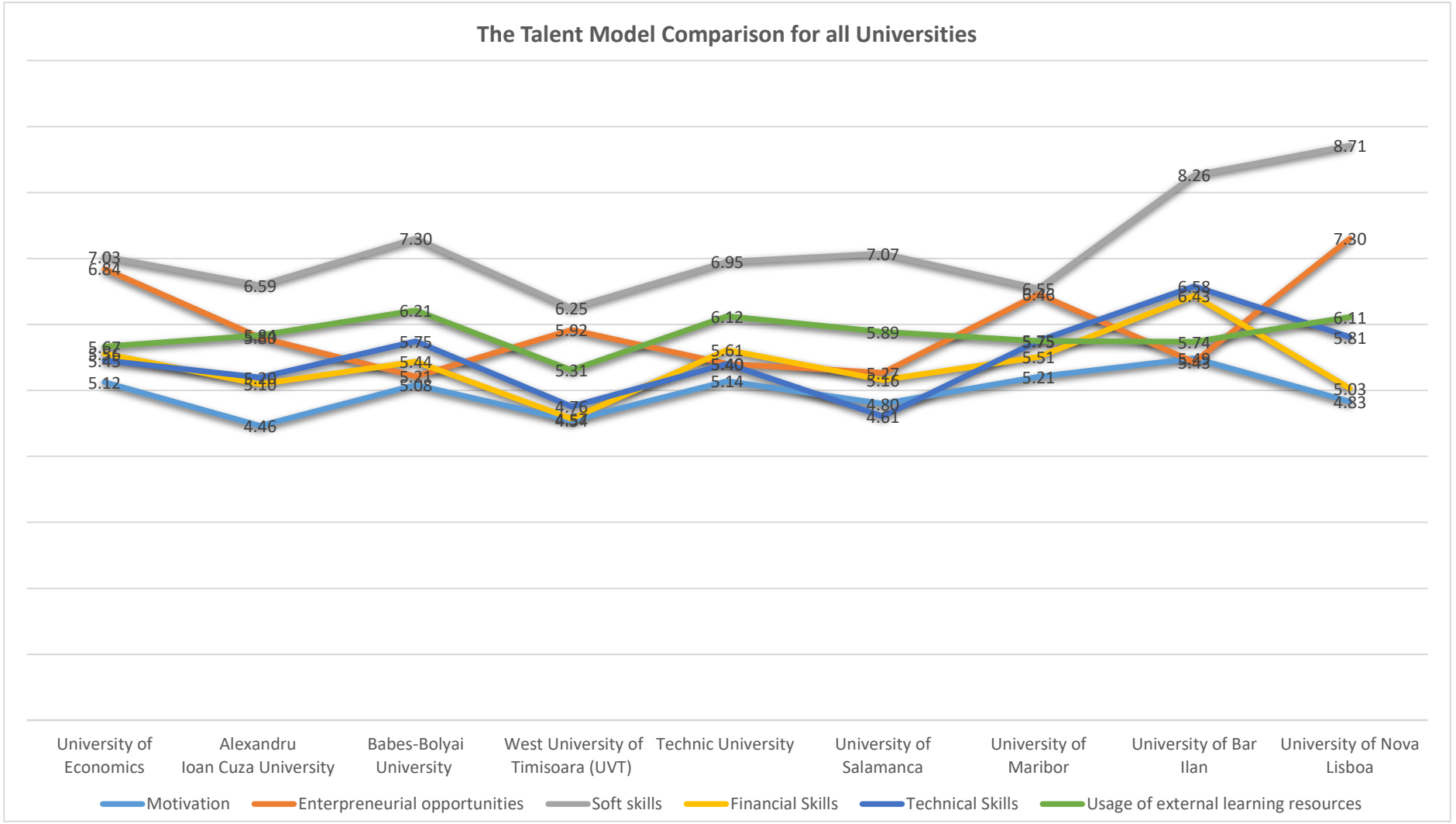
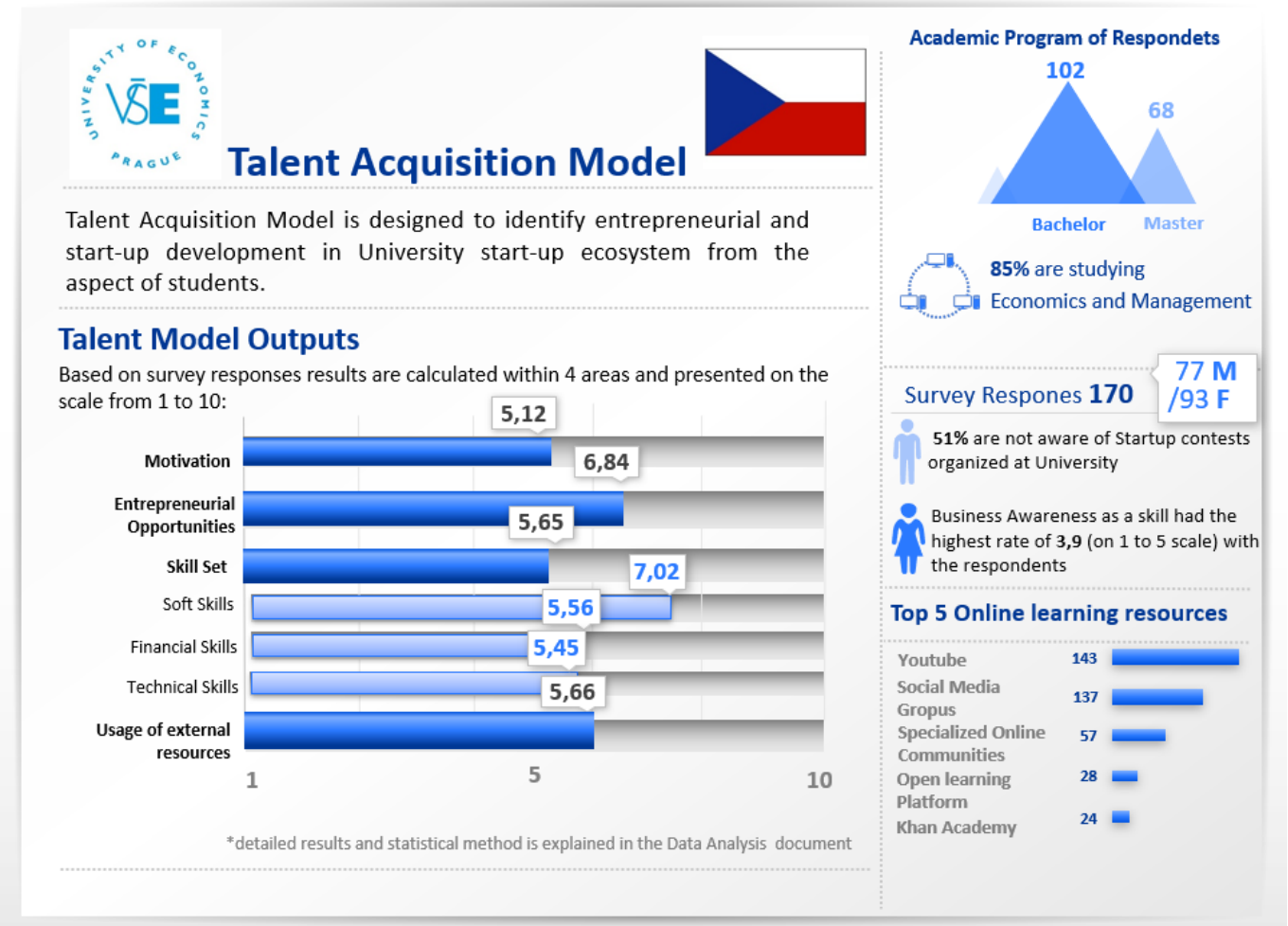
Country	Romania				Czech Republic	Slovenia	Spain	Israel	Portugal
Output/ University	***Alexandru Ioan Cuza University (UAIC)***	***Babes-Bolyai University (UBB)***	***West University of Timisoara (UVT)***	***Technic University (UTCN)***	***University of Economics, Prague***	***University of Maribor***	***University of Salamanca***	***University of Bar Ilan***	***University of Nova Lisboa***
1. Motivation	**4,46**	**5,08**	**4,54**	**5,14**	**5,12**	**5,21**	**4,80**	**5,49**	**4,83**
1.a. Please indicate your level of involvement in University entrepreneurship activity:	2,49	3,23	2,63	3,63	3,38	3,74	3,55	3,94	4,33
1.b. How interested are you towards working or creating your own start-up?	6,43	6,94	6,46	6,66	6,87	6,68	6,04	7,03	5,33
2. Awareness of entrepreneurial opportunities on University	**5,80**	**5,21**	**5,92**	**5,40**	**6,84**	**6,46**	**5,27**	**5,43**	**7,30**
2.a. Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:	5,68	4,93	5,73	4,51	7,42	6,55	5,26	6,80	7,84
2.b. Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organised at your University?	6,14	6,00	5,84	6,00	7,22	6,68	5,66	5,70	8,05
2.c. What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?	4,84	4,08	5,78	4,15	6,22	5,83	4,51	5,00	5,84
2.d. How involved are your university student organizations in entrepreneurship activities?	6,55	5,84	6,31	6,96	6,52	6,77	5,64	4,22	7,48
3. Skills Set	**5,63**	**6,16**	**5,19**	**5,99**	**6,01**	**5,94**	**5,61**	**7,09**	**6,52**
3.a. Soft skills	6,59	7,30	6,25	6,95	7,03	6,55	7,07	8,26	8,71
3.b. Financial Skills	5,10	5,44	4,57	5,61	5,56	5,51	5,16	6,43	5,03
3.c. Technical Skills	5,20	5,75	4,76	5,40	5,45	5,75	4,61	6,58	5,81
4. Usage of external learning resources	**5,84**	**6,21**	**5,31**	**6,12**	**5,67**	**5,75**	**5,89**	**5,74**	**6,11**
4.a. Future Trends	4,85	4,77	4,03	5,40	4,86	5,08	4,92	5,06	5,49
4.b. Usage of web resources	6,83	7,65	6,59	6,84	6,47	6,42	6,86	6,41	6,73
SUM:	**21,73**	**22,67**	**20,96**	**22,66**	**23,65**	**23,35**	**21,57**	**23,74**	**24,76**


The Talent Model Comparison for all Universities
University of Economics
Alexandru Ioan Cuza University
Babes-Bolyai University
West University of Timisoara (UVT)
Technic University
University of Salamanca
University of Maribor
University of Bar Ilan
University of Nova Lisboa
Motivation
Enterpreneurial opportunities
Soft skills
Financial Skills
Technical Skills
Usage of external learning resources

7.1. Czech Republic

7.1.1. University of Economics Prague



Talent Acquisition Model
Data Analysis of the Survey

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4

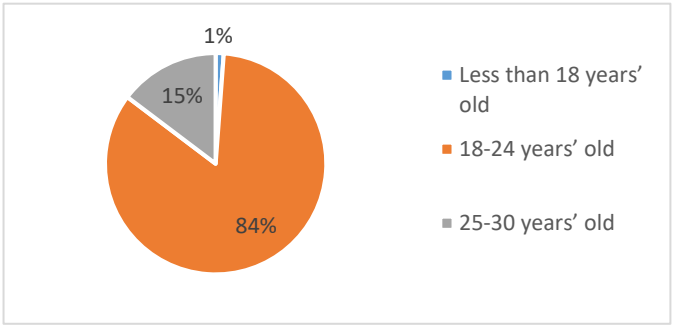
questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

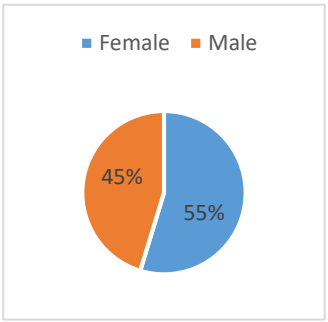
Total data analysed from all of the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data:

Age of the respondents:



Gender:



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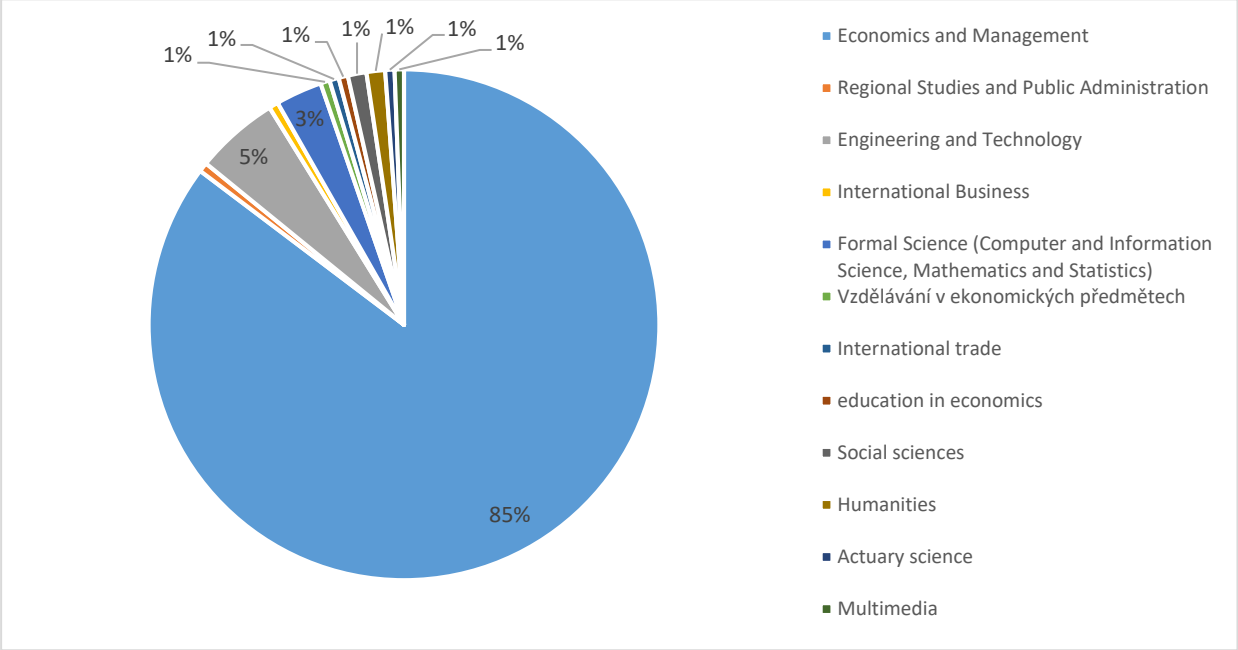
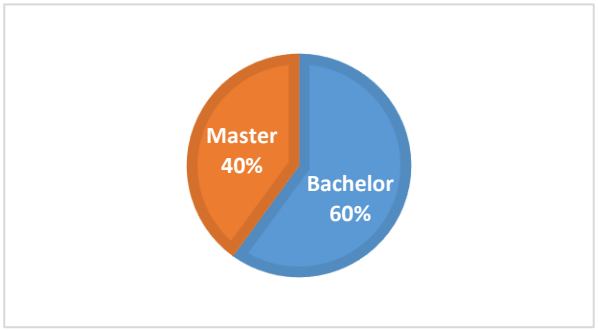
Academic disciplines:



Level of Studying:



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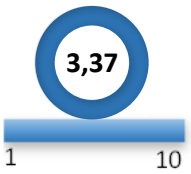
1. Motivation towards Entrepreneurship

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



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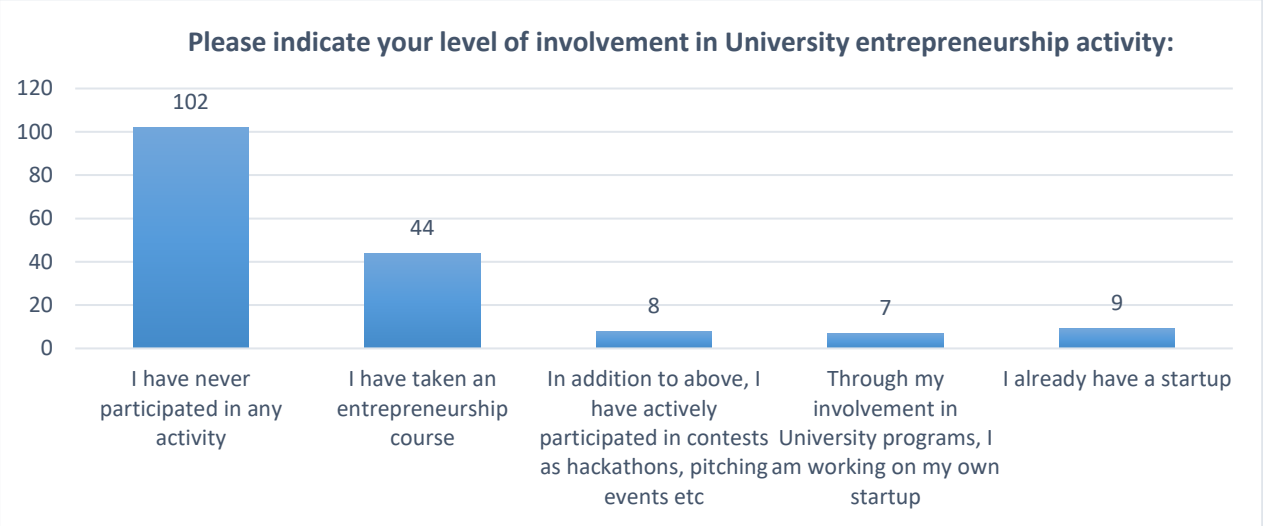
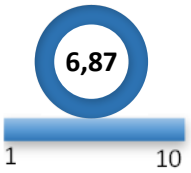
Q: Please indicate your level of involvement in University entrepreneurship activity:

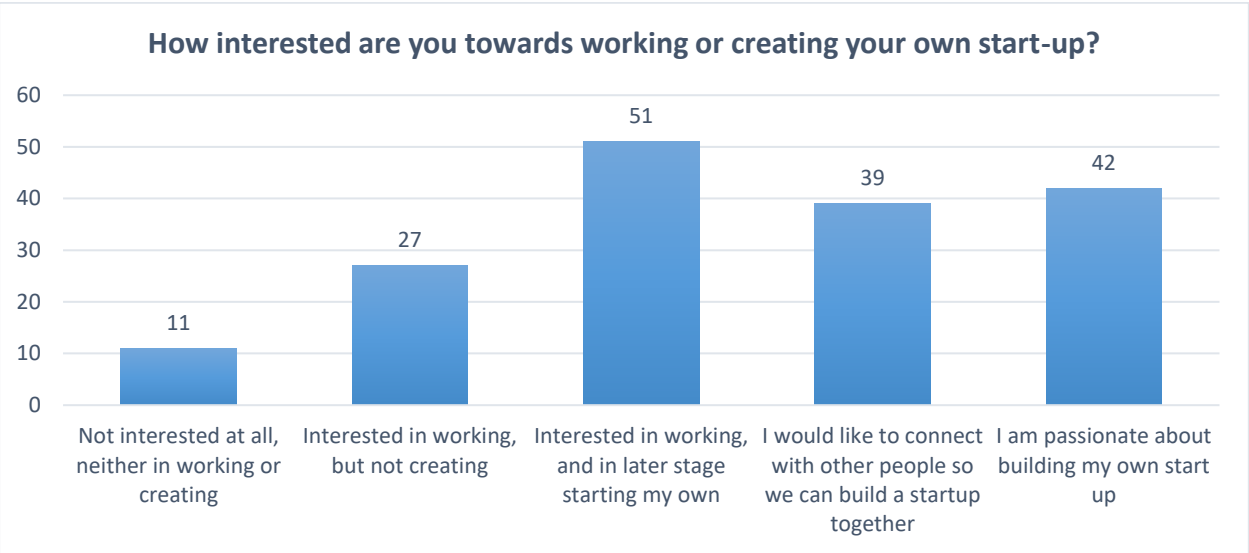


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Over 60% of respondents have never participated in any entrepreneurial activity so far, but on another side, **respondents have highly indicated the interest in working for a startup, founding their own** or connecting to other people in order to cofound or try some entrepreneurial activity.

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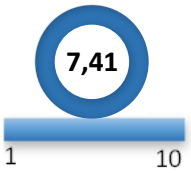
2. Awareness of entrepreneurial opportunities on University

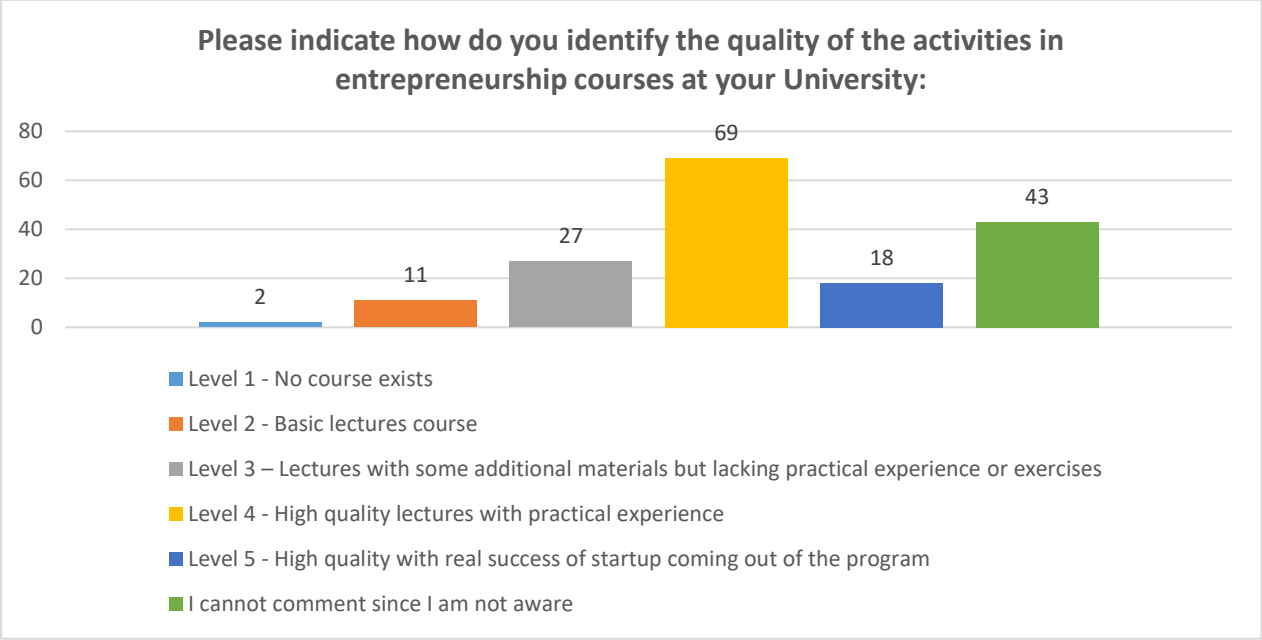
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:

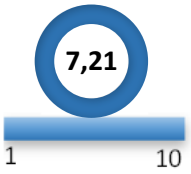


Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:



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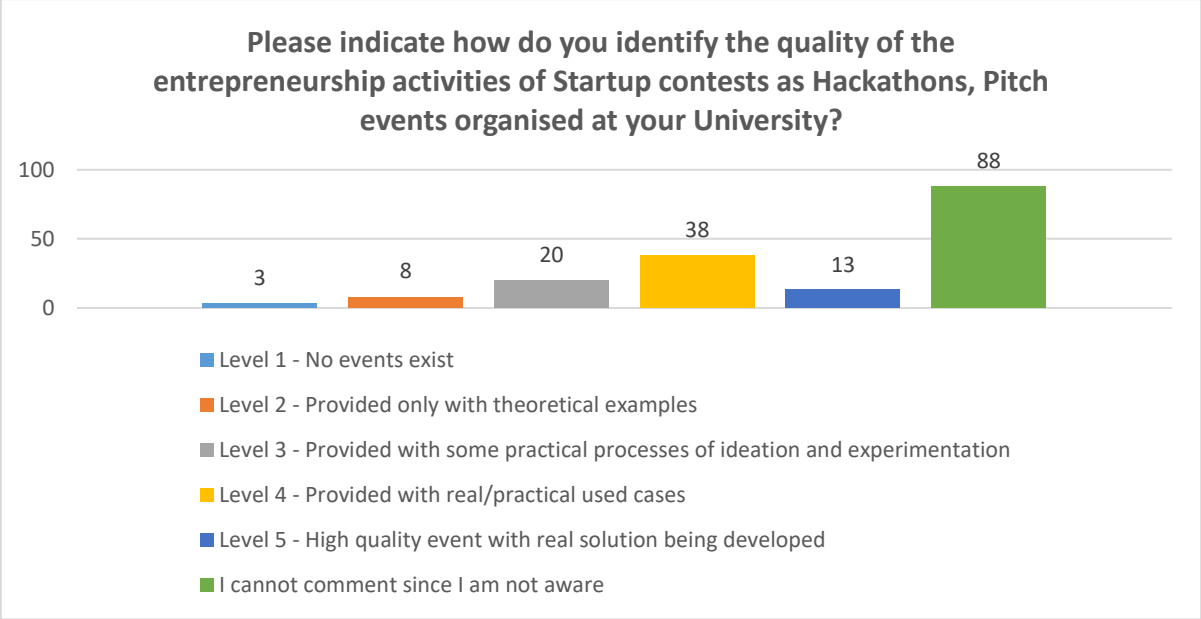
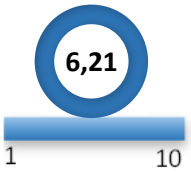
Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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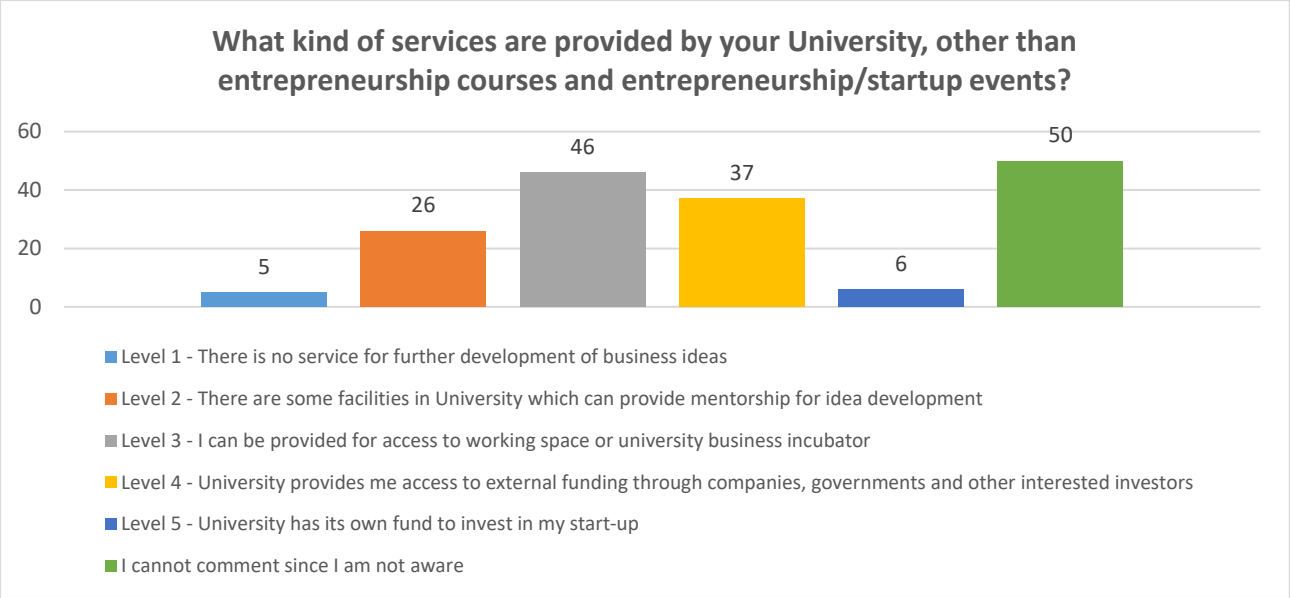
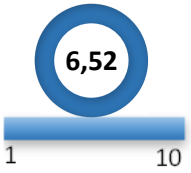


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?

To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any

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activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to take a look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

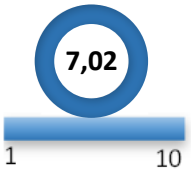
For all four questions of this output, the variable *I cannot comment since I am not aware is high* (around 40%), signalizing the respondents **low to medium level of awareness** (different from question to question). After taking out this variable, and observing the rest of the results, respondent have mainly chosen levels **2, 3 and 4 (medium to high level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of incubators which can provide mentorship support and financial support from different funds. Respondents have indicated (again with high percentage of unawareness), that student organization have weekly organized entrepreneurial activities with the highest response rate from all possible answers.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.

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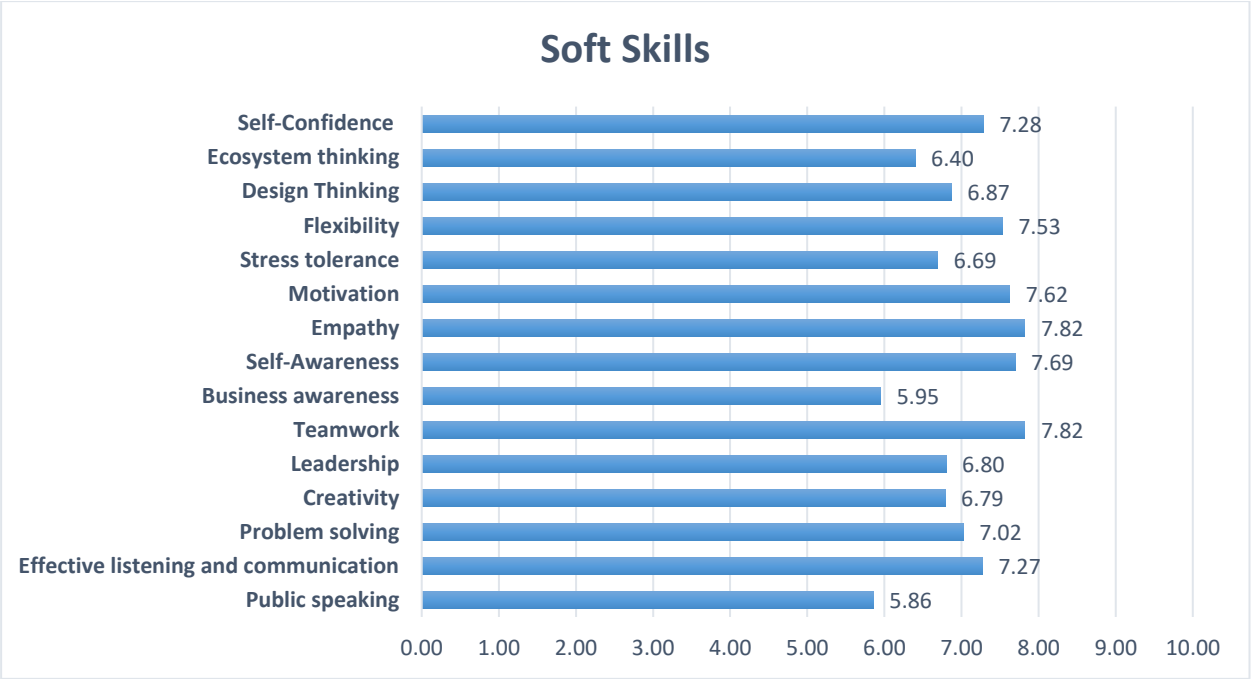
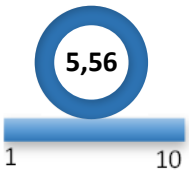


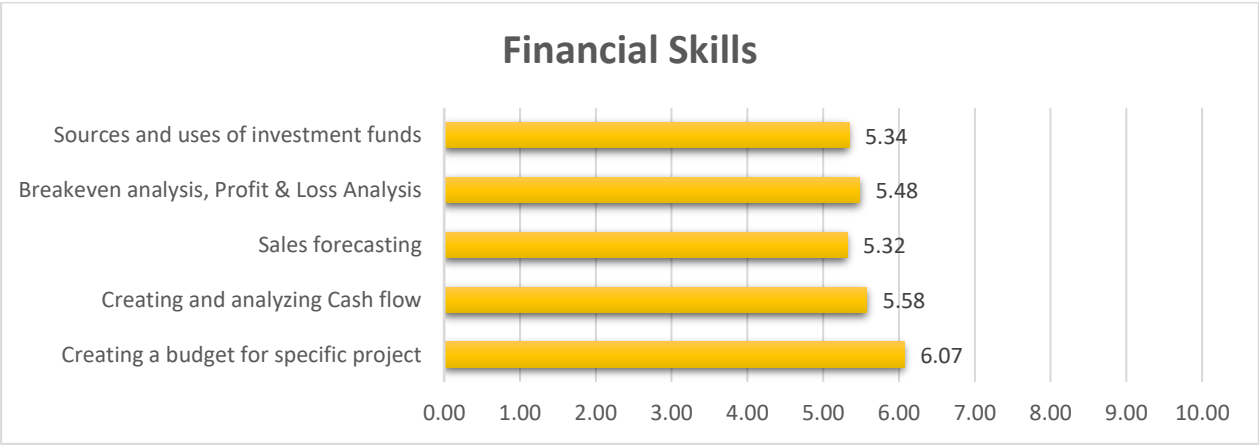
Empathy, Teamwork and Self-Awareness have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3a. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.



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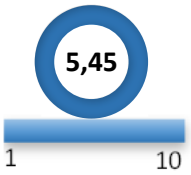
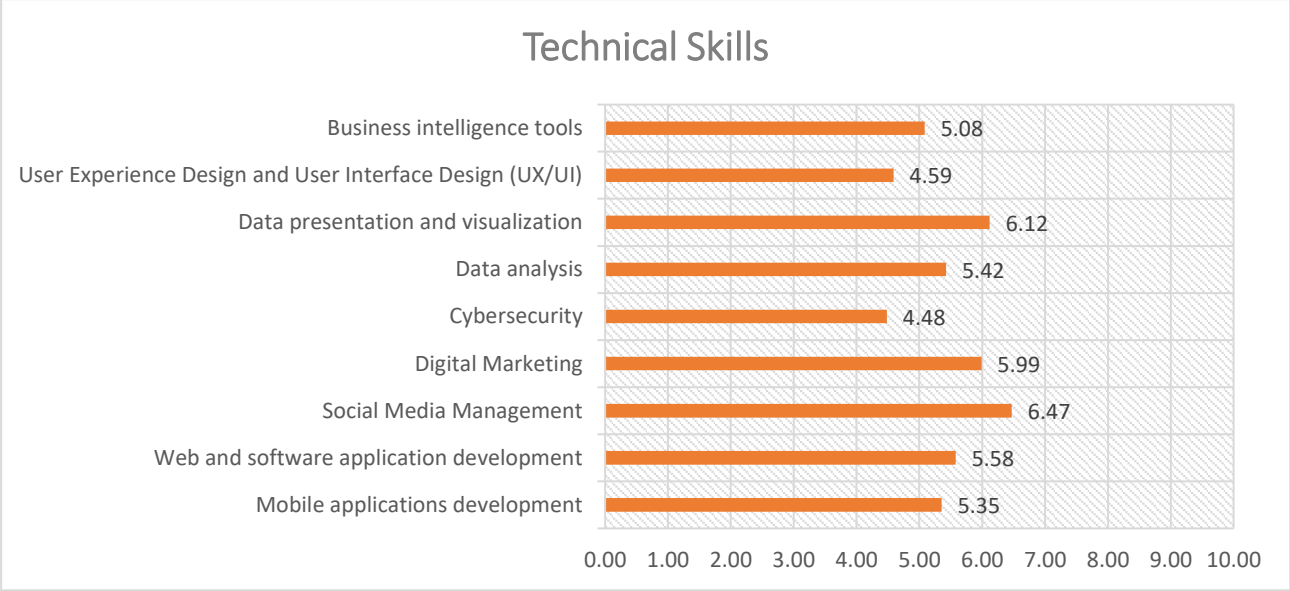
Highest overall rate selected by the respondent from the Financial skills are Creating a budget and Analysing the cash flow, and lowest response rate had Sales Forecasting.

3a. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Highest overall rate selected by the respondent from technical skills are Social Media Management and Digital Marketing are application development are mostly selected as experienced skills among respondents, and Cybersecurity and User Experience Design and User Interface Design as the lowest rated in awareness and experience by the respondents.

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4. Usage of external learning resources

The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

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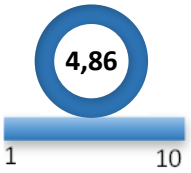
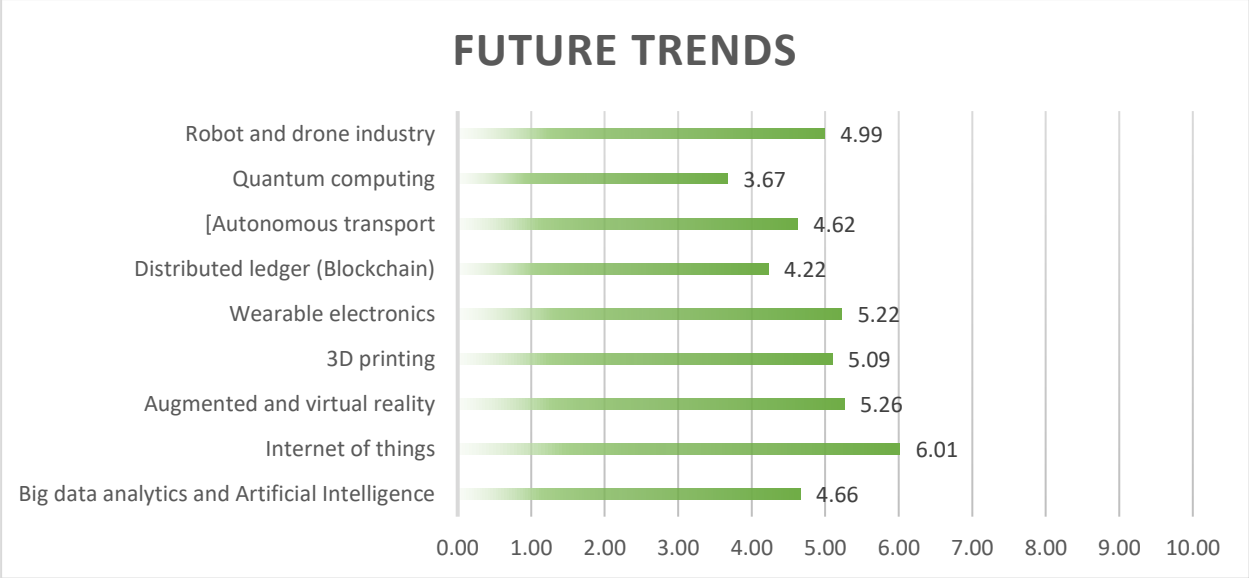
4a. Future Trends

Mean Score:



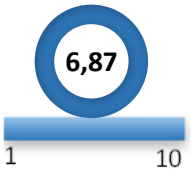
Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas and Internet of things, Augmented and virtual reality and Wearable electronics, and least knowledgeable in BlockChain and Quantum Computing.

4b. Usage of web resources

Mean Score:



Q: How actively do you use web resources to gain new knowledge?

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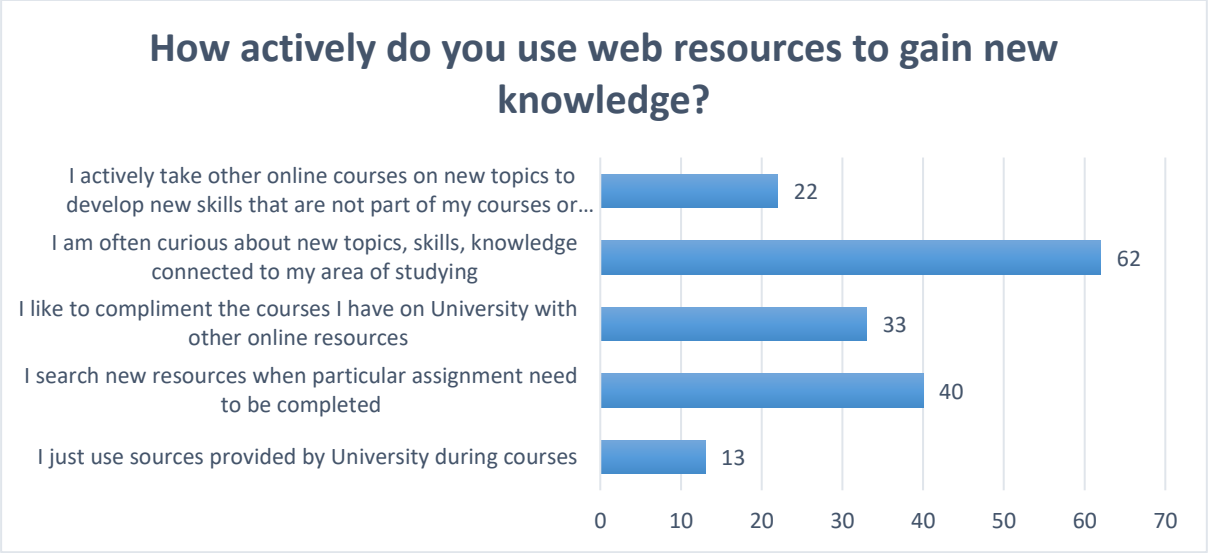
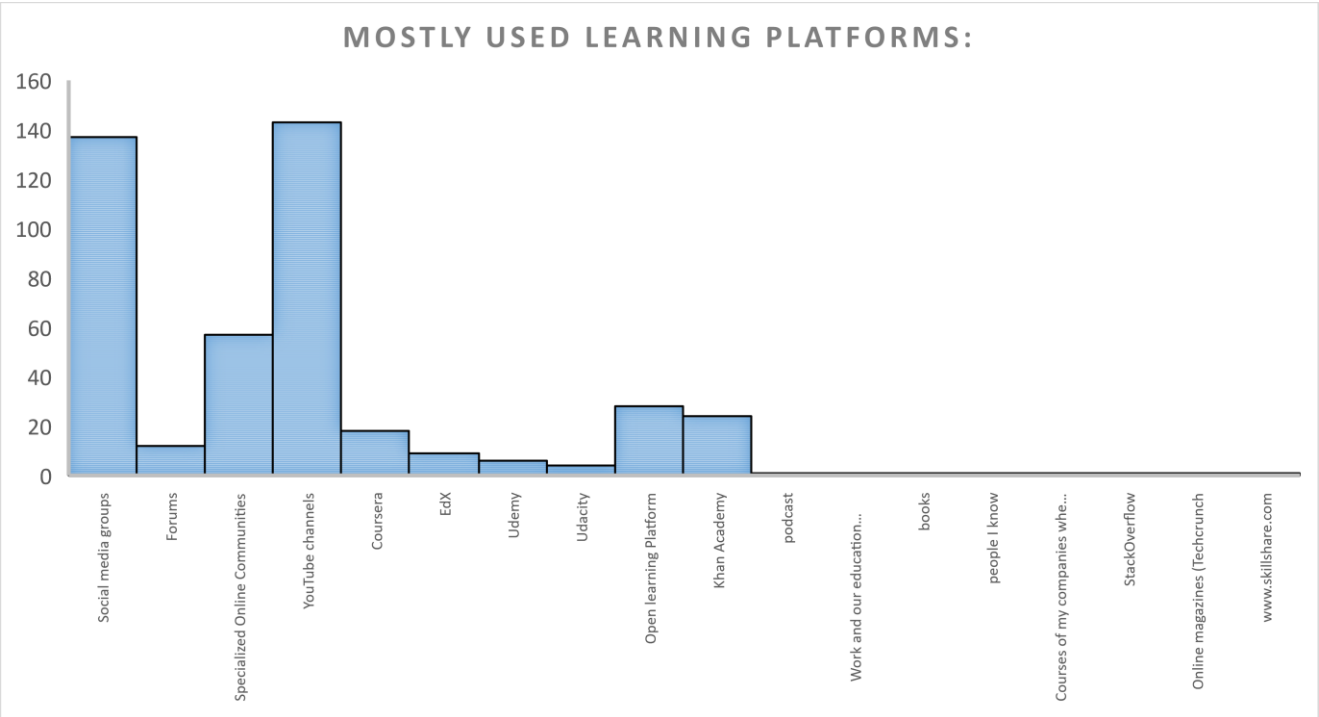


High response rate of students indicates an often curiosity and update on the knowledge connected to the study area, and as well use online courses to develop new skills and topics not connected to curriculum.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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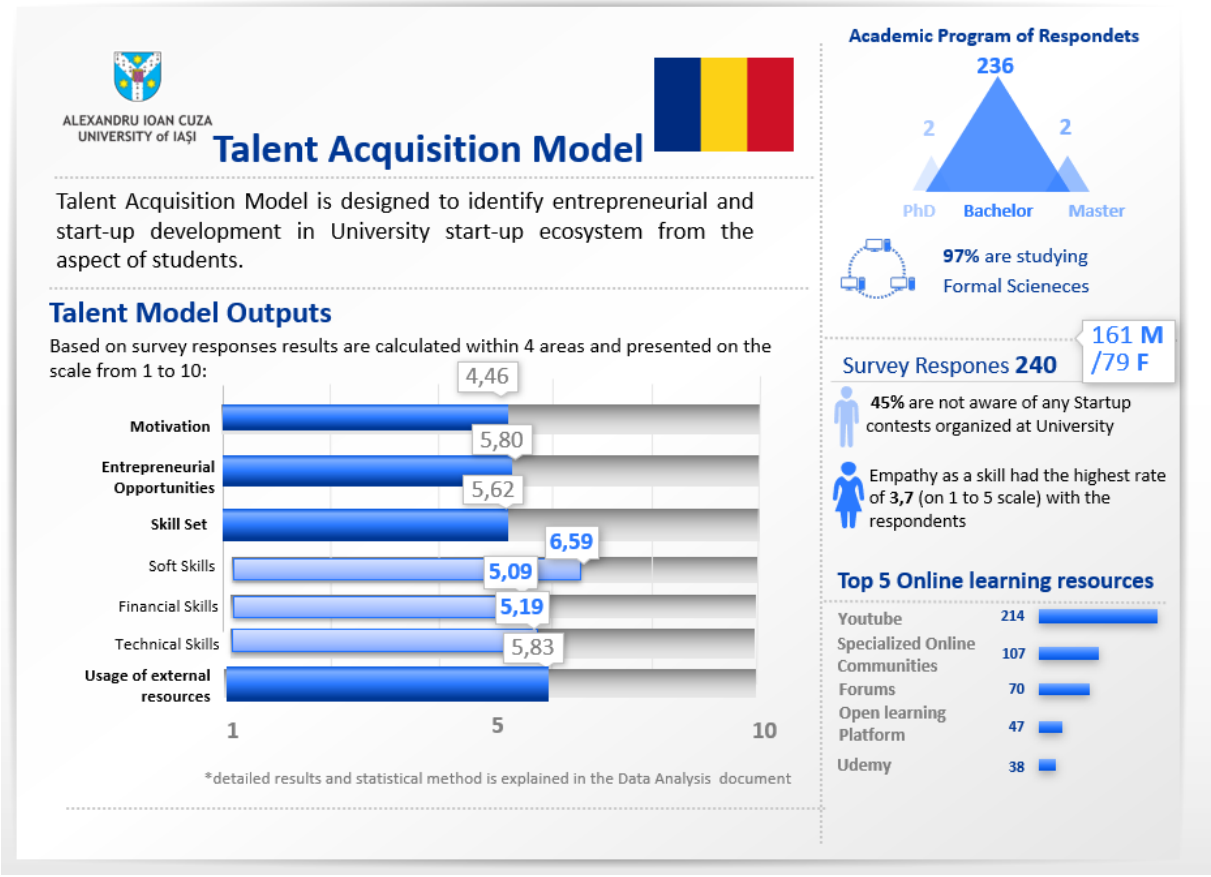
7.2. Romania

7.2.1. Alexandru Ioan Cuza University



Talent Acquisition Model
Data Analysis of the Survey

ALEXANDRU IOAN CUZA UNIVERSITY of IAȘI

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

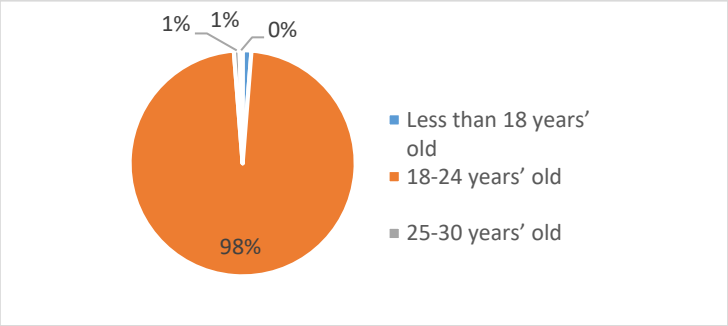
From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

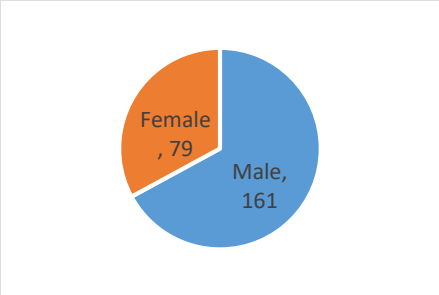
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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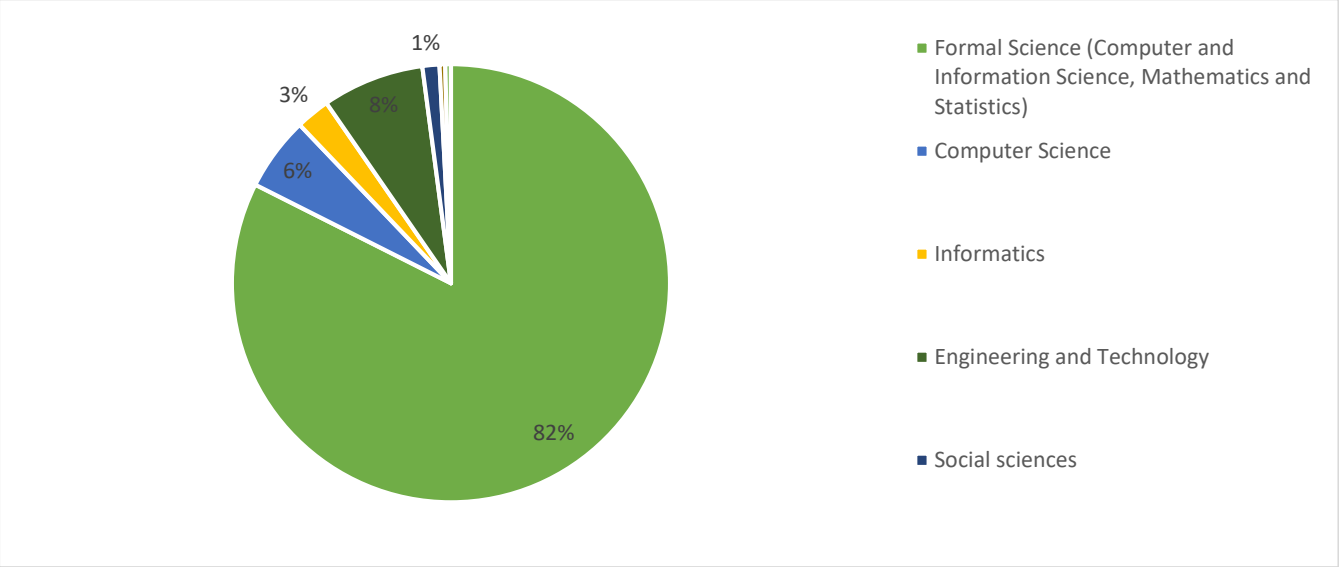
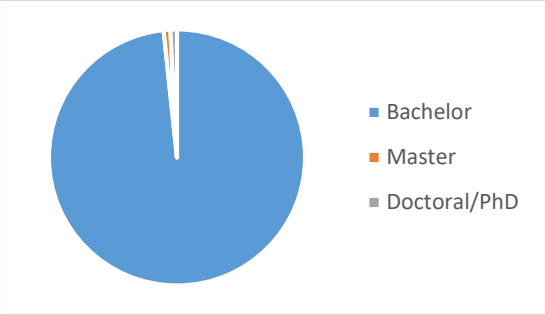
Academic disciplines:



Level of Studying:



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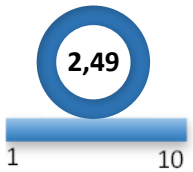
1. Motivation towards Entrepreneurship

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



Q: Please indicate your level of involvement in University entrepreneurship activity:

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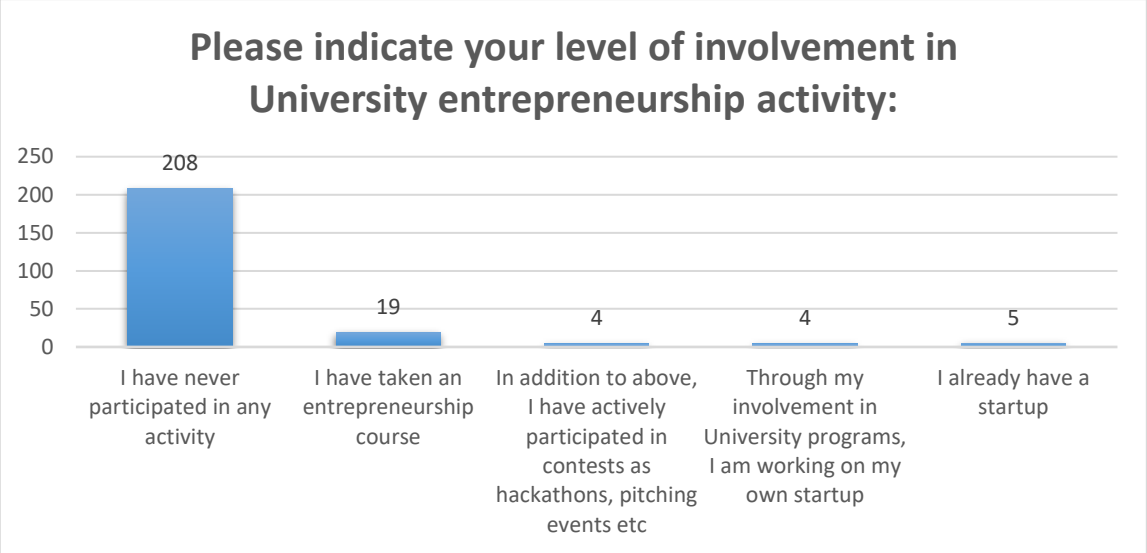
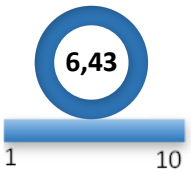
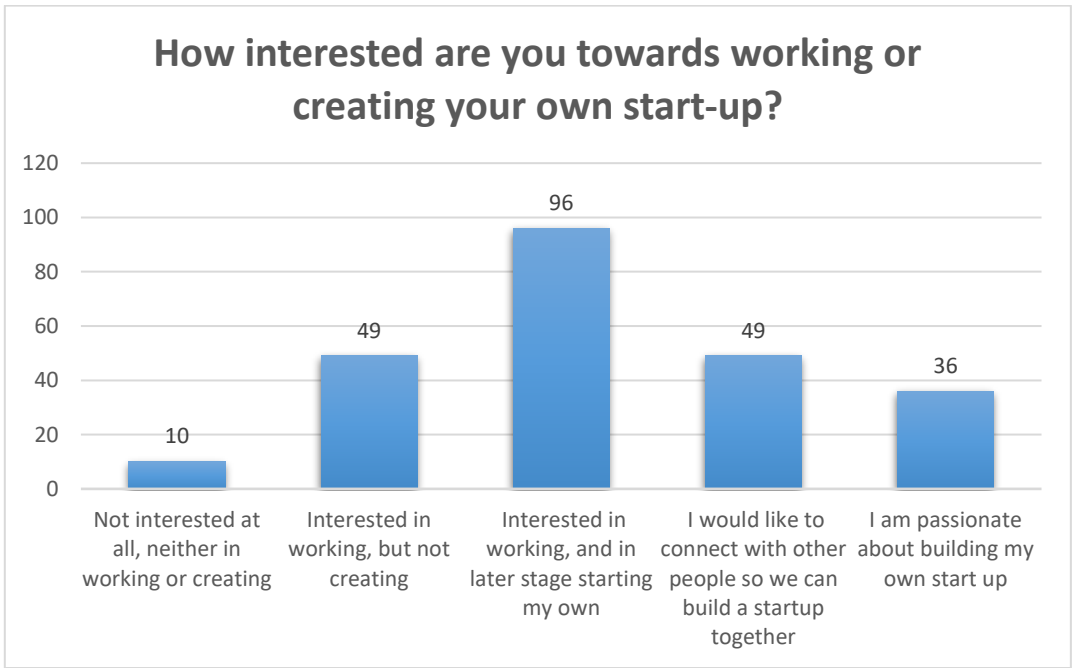


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Majority of respondents have never participated in any entrepreneurial activity so far, but on another side, **respondents have highly indicated** the interest in working for a startup,

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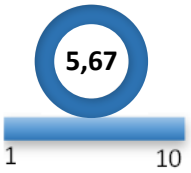
founding their own or connecting to other people in order to cofound or try some entrepreneurial activity.

2. Awareness of entrepreneurial opportunities on University

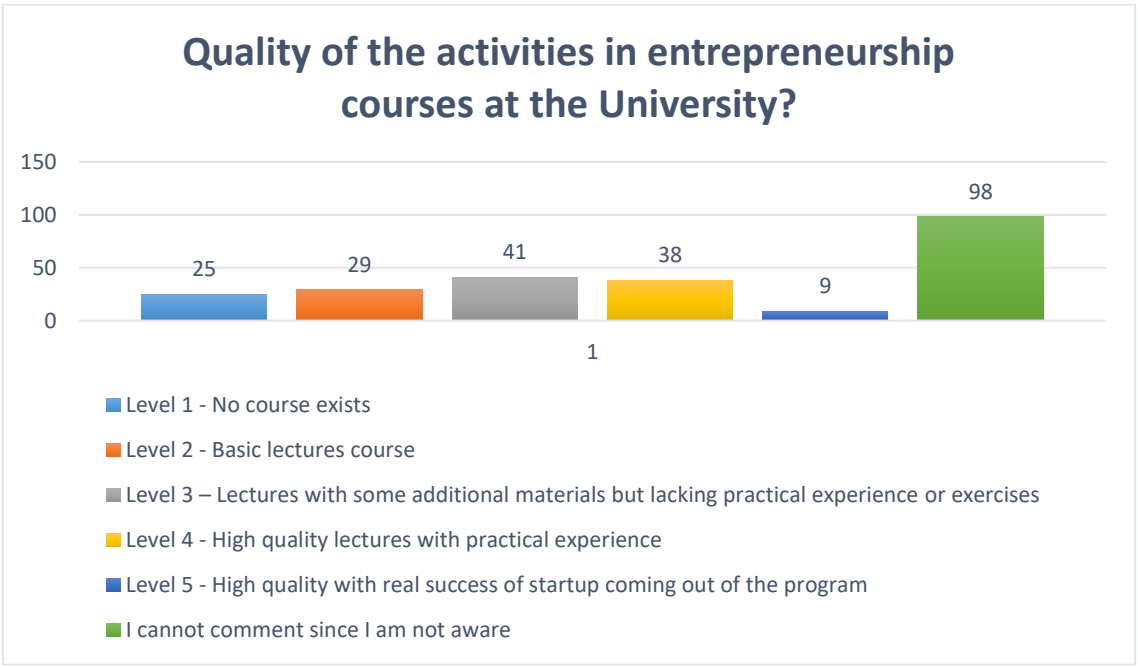
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:



Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



2b. Quality of the entrepreneurship activities of Startup contests

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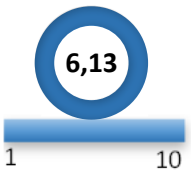
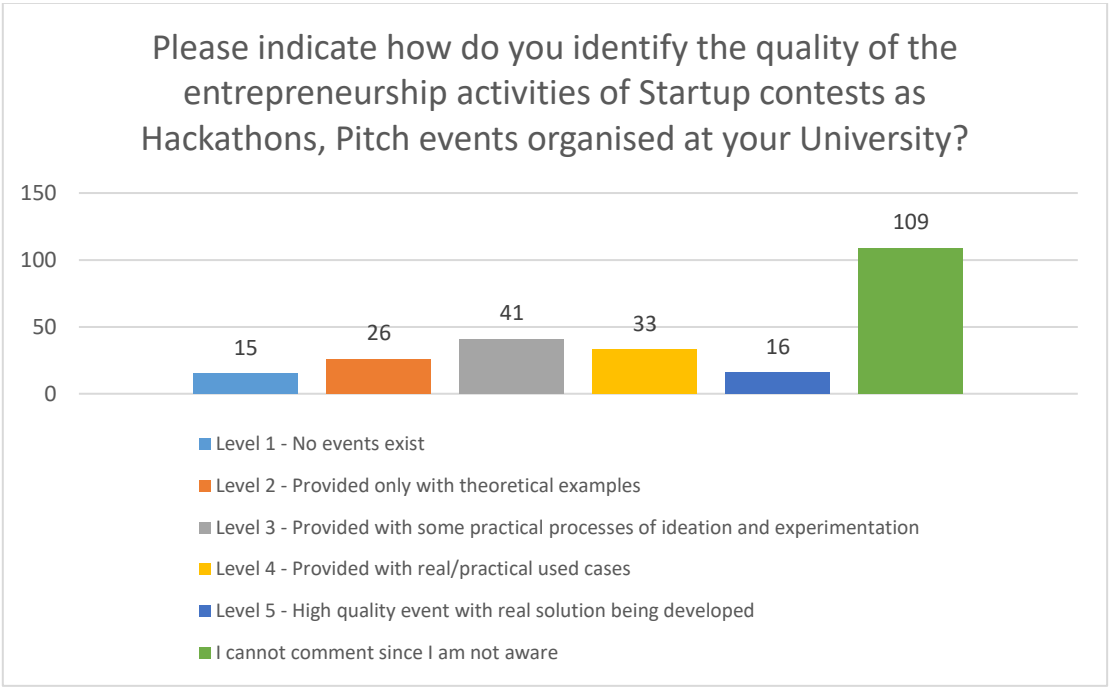
Mean Score:

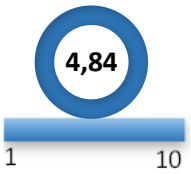


Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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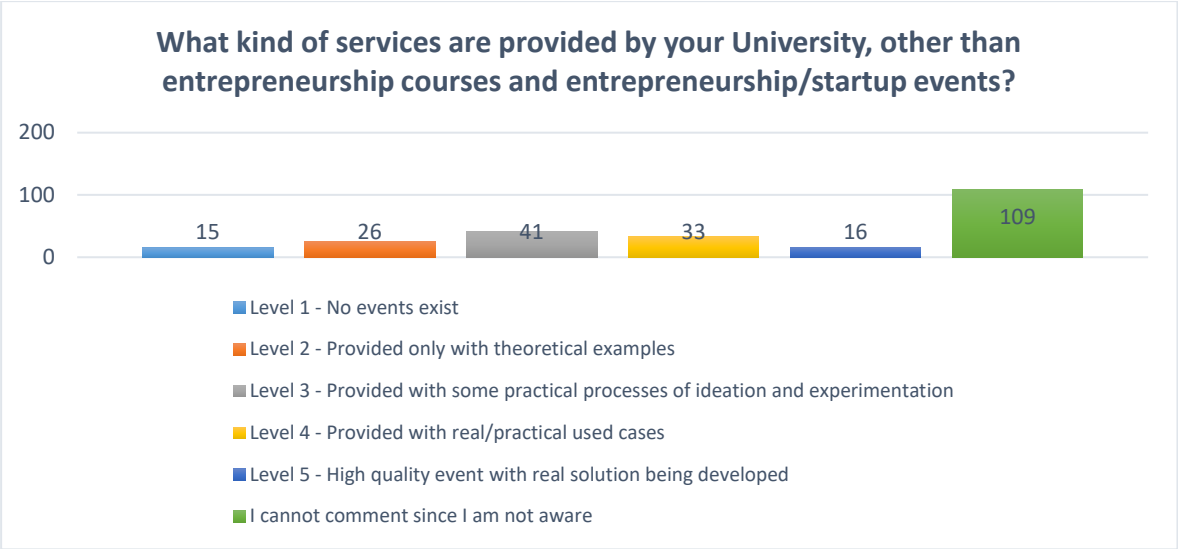
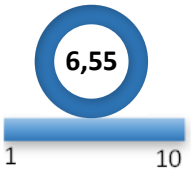
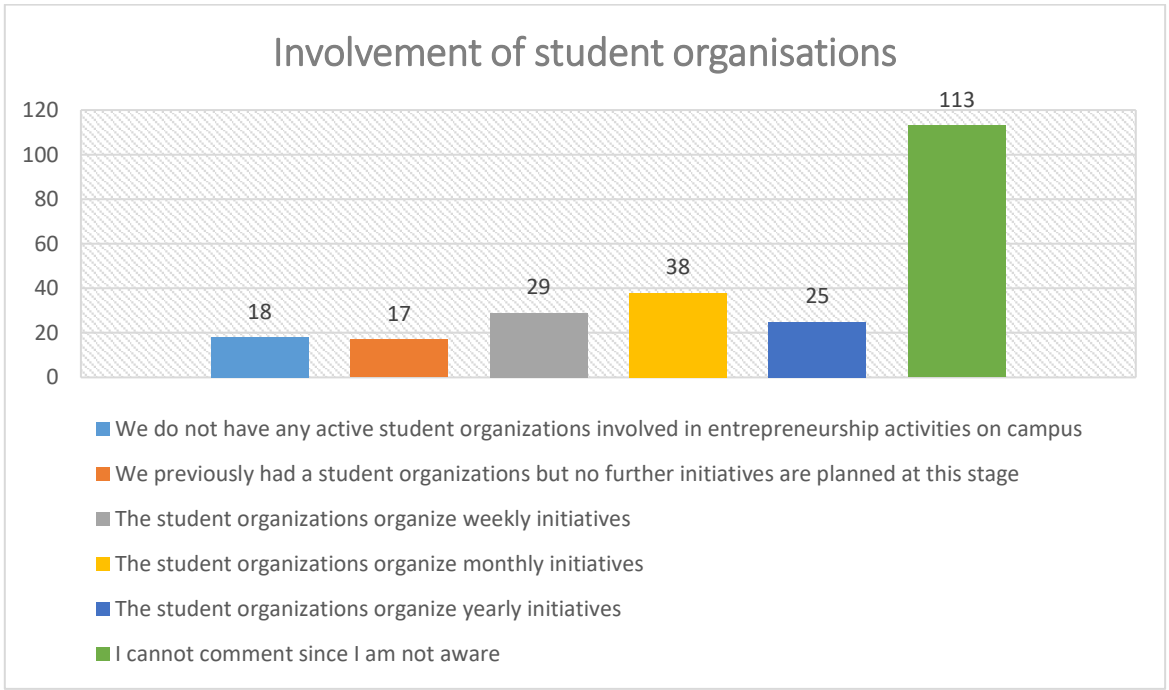


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?



To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order

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to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further develop awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and so please be advised to look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

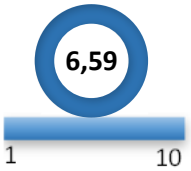
For all four questions of this output, the variable *I cannot comment since I am not aware is high* (around 50%), signalizing the respondents **did not have any connected activities or their level of unawareness**. After taking out this variable, and observing the rest of the results, respondent have mainly chosen level **3 and 4 (medium and high level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities which can provide mentorship support for idea development and respondents have indicated (in the highest percentage) that student organization have monthly and yearly organized entrepreneurial activities.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



Q: Please indicate your level of confidence in the following soft skills and competences on the 5-point scale from Not Confident to Extremely Confident.

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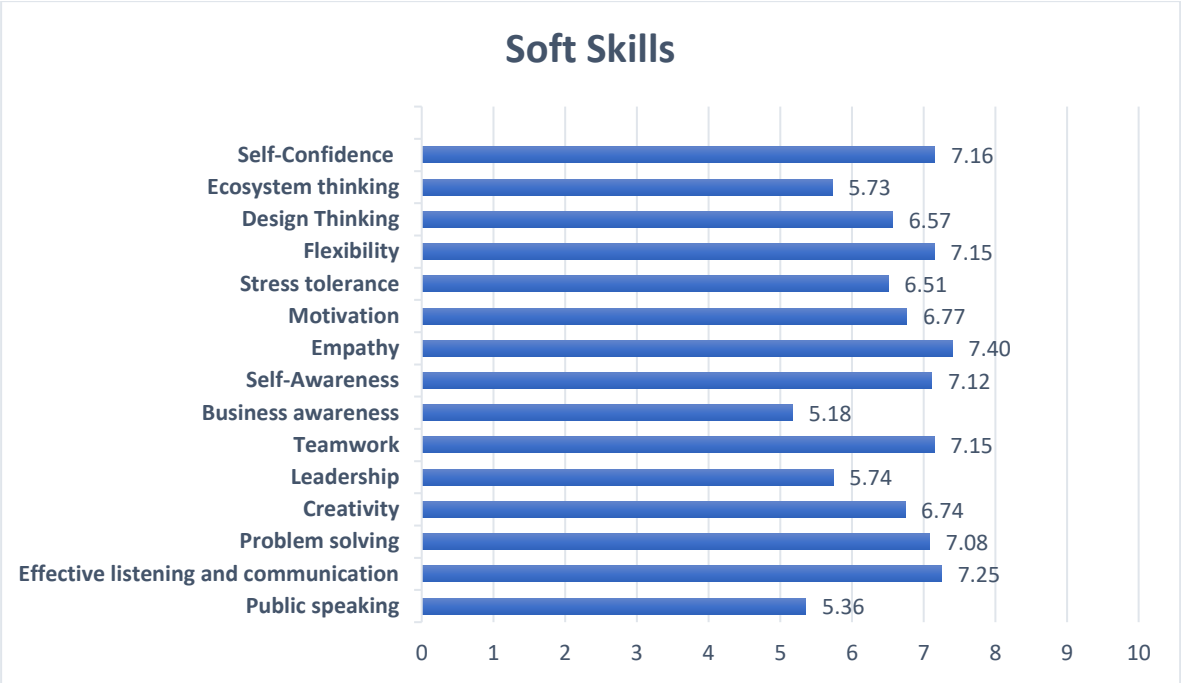
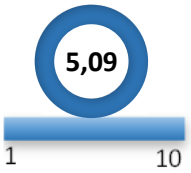


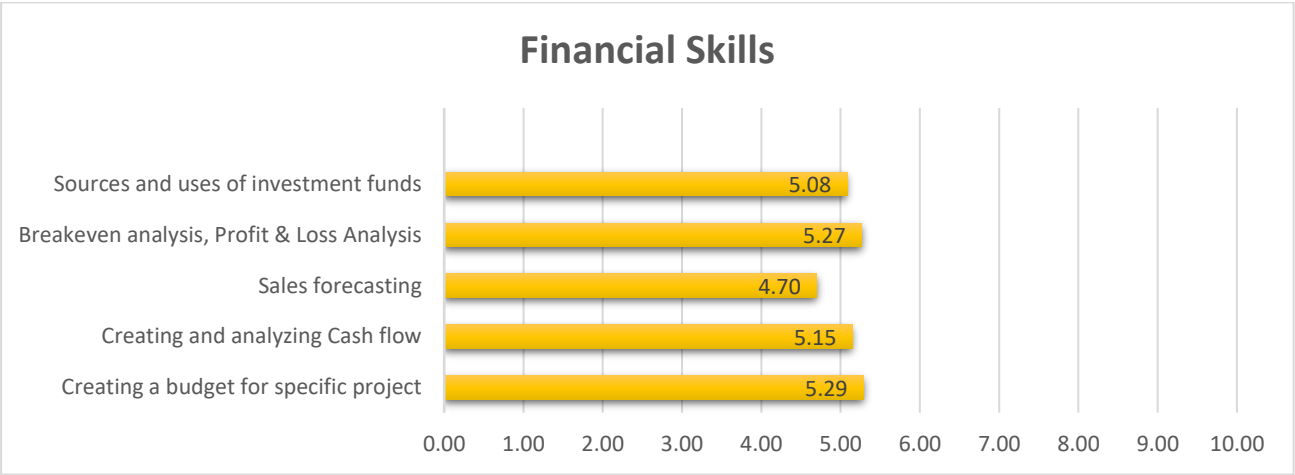
Empathy and Self-Confidence and Motivation have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business awareness as the least confident ones.

3a. Financial skills

Mean Score:



Q: Please identify your confidence in ability to execute the following financial skills on the 5-point scale from Not Confident to Extremely Confident.



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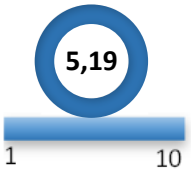
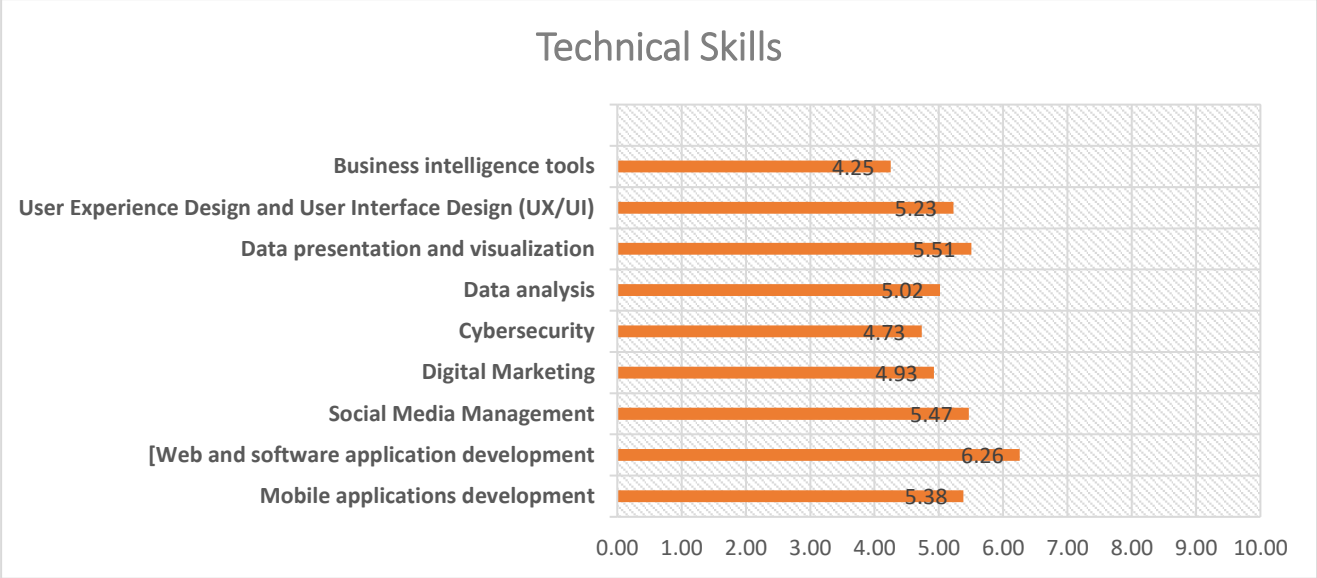
Highest overall rate selected by the respondent from the Financial skills are Creating a budget and analysing the cash flow, and lowest response rate had Sales Forecasting.

3a. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the 5-point scale from Not Aware to Expert user.



Highest overall rate selected by the respondent from the technical skills are Web and software application development, Social Media management, and Cybersecurity and User Experience Design as the lowest rated skills in awareness and experience of the respondents.

4. Usage of external learning resources

The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

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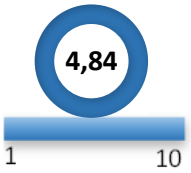
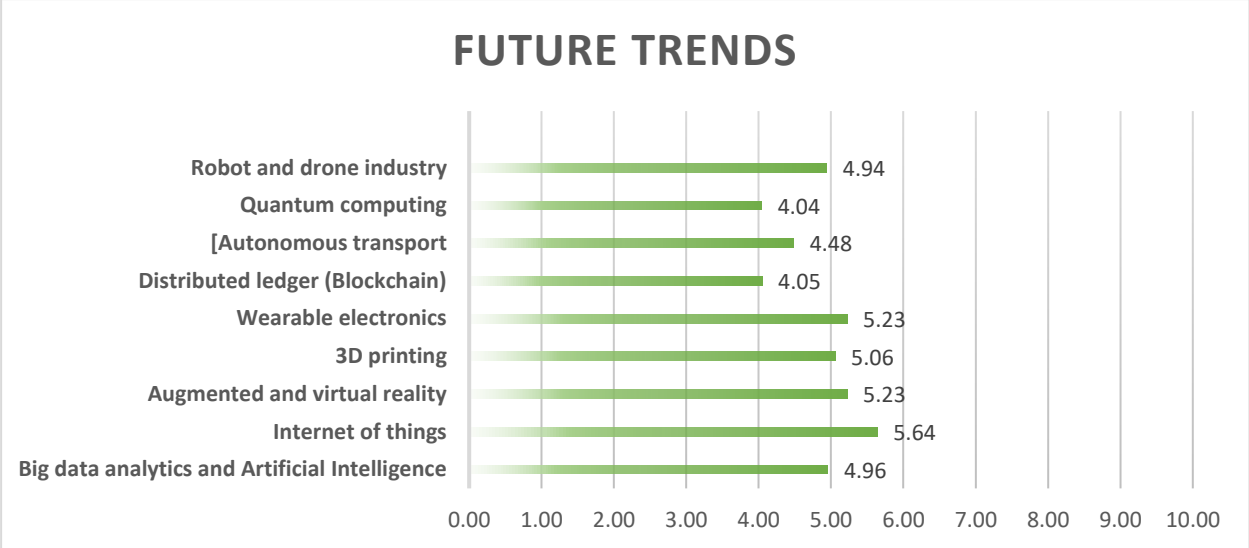
4a. Future Trends

Mean Score:



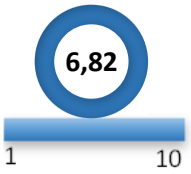
Q: Please identify your awareness and knowledge of the following topics on the 5-point scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas of 3D Printing, AI and Internet of things.

4b. Usage of web resources

Mean Score:



Q: How actively do you use web resources to gain new knowledge?

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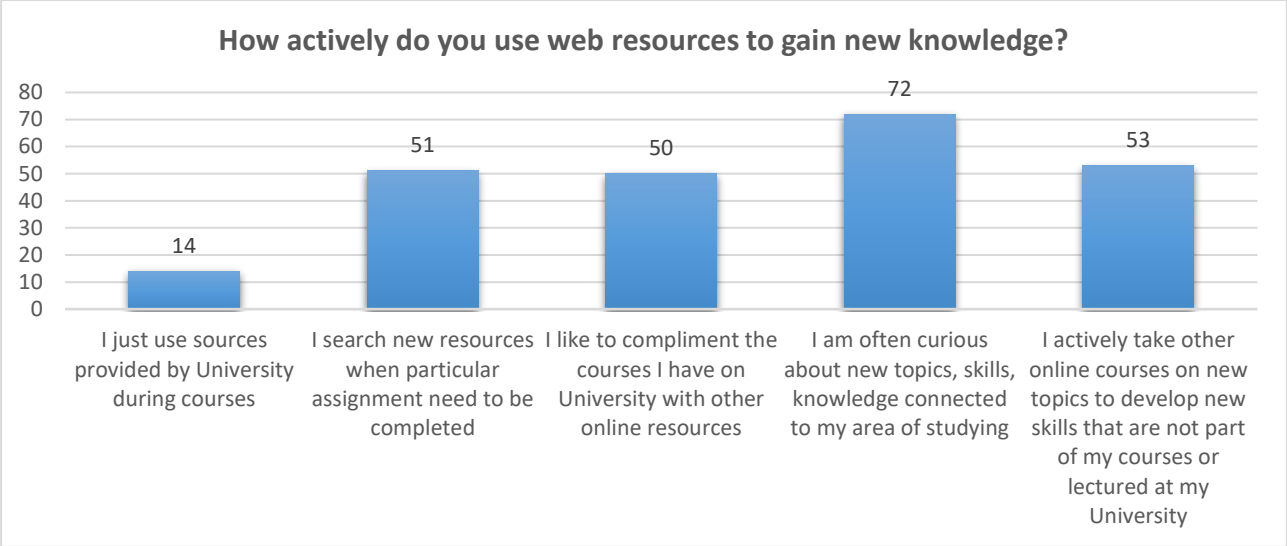
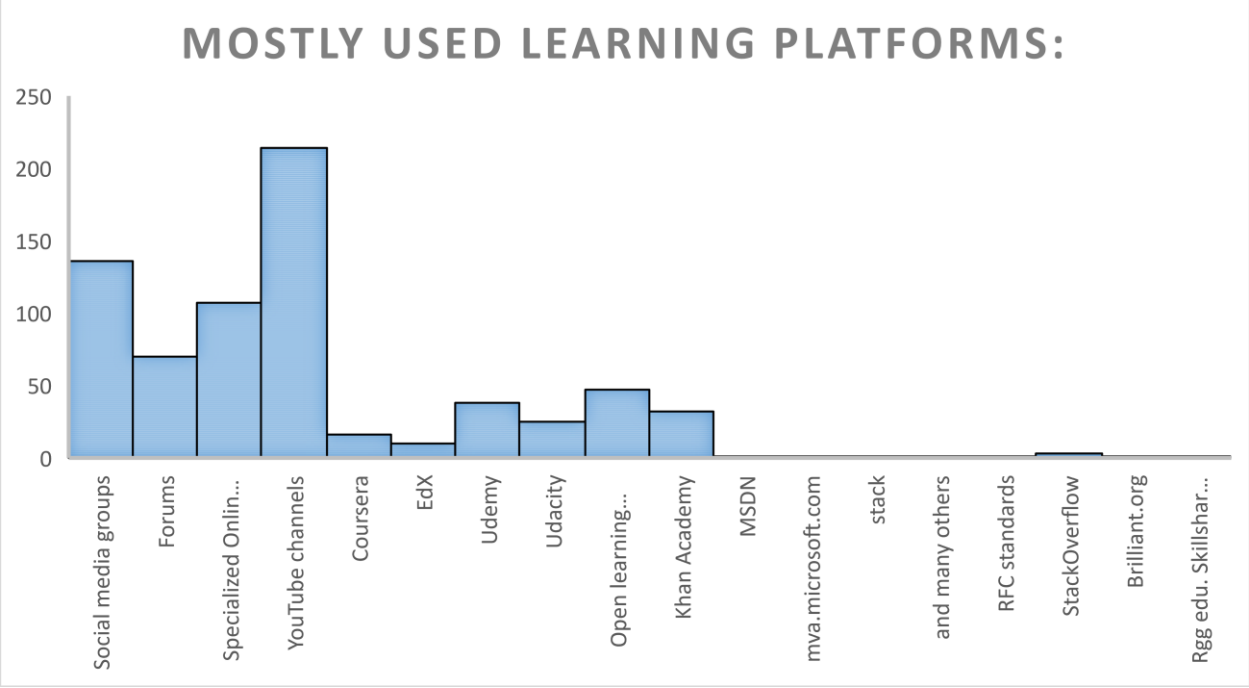


High response rate of students indicates an often curiosity and update on the knowledge connected to the study area, and as well use online courses to develop new skills and topics not connected to curriculum.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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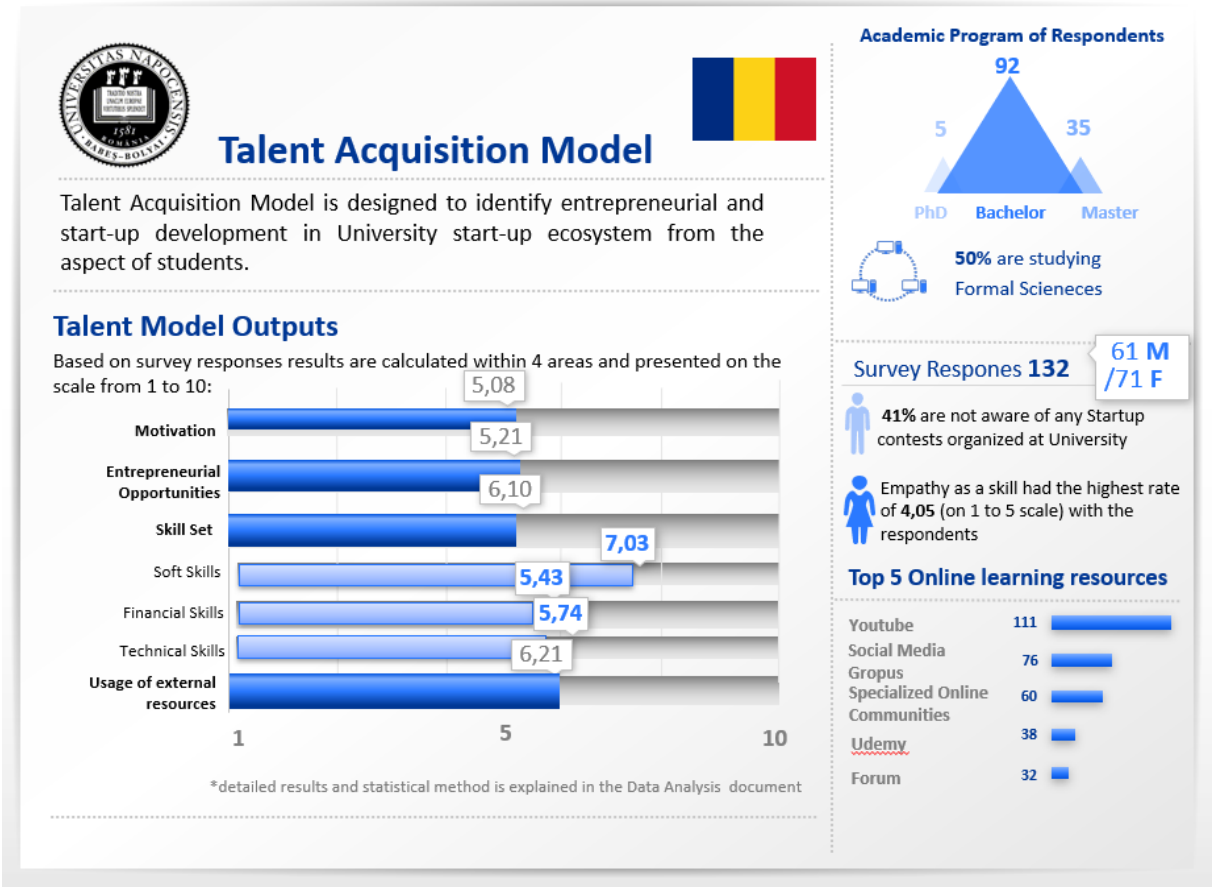
7.2.2. Babes-Bolyai University



Talent Acquisition Model
Data Analysis of the Survey

The Talent Acquisition model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question.

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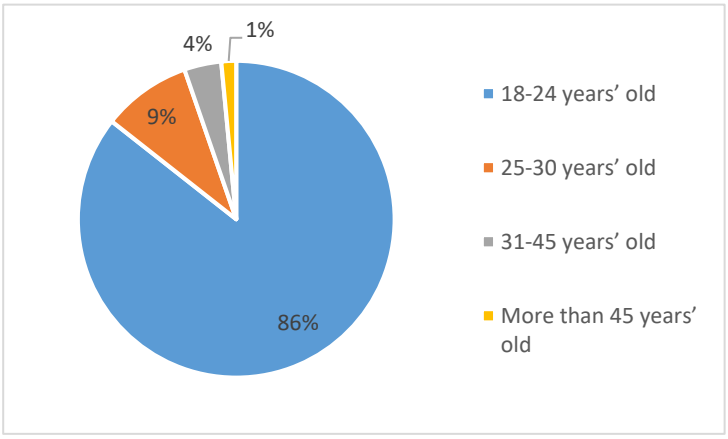
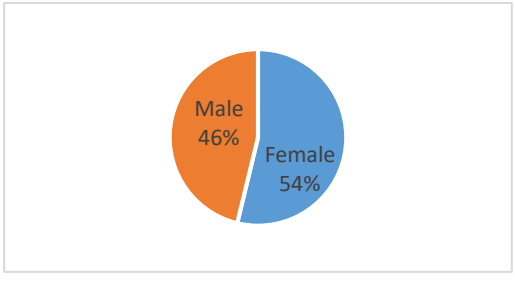
Total data analysed from all of the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



Academic disciplines:

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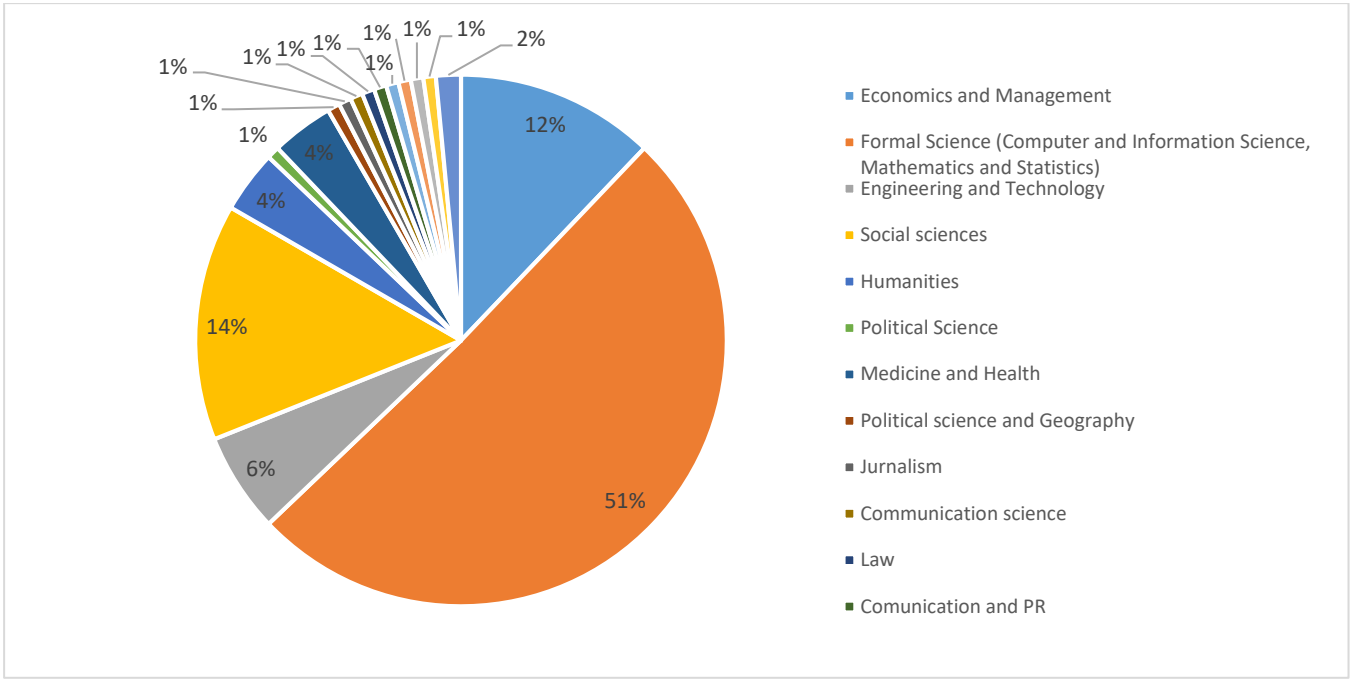
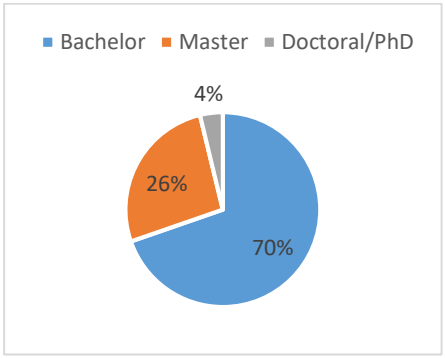


Level of Studying:

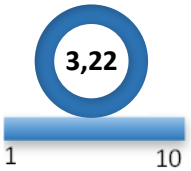


1. Motivation towards Entrepreneurship

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



Q: Please indicate your level of involvement in University entrepreneurship activity:

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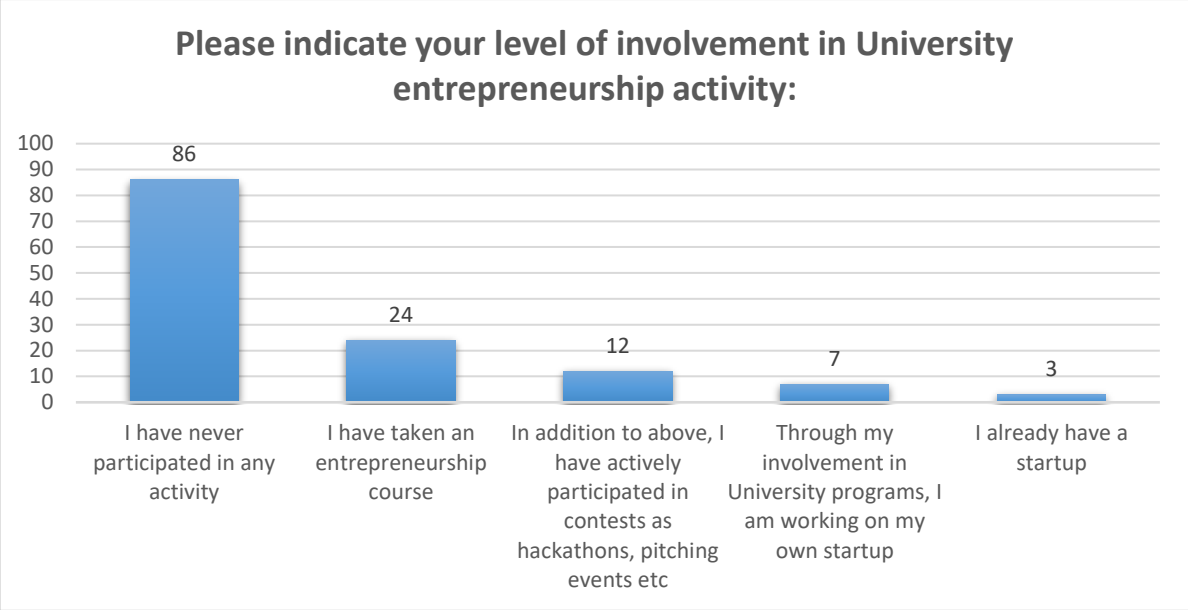
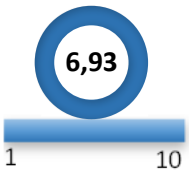
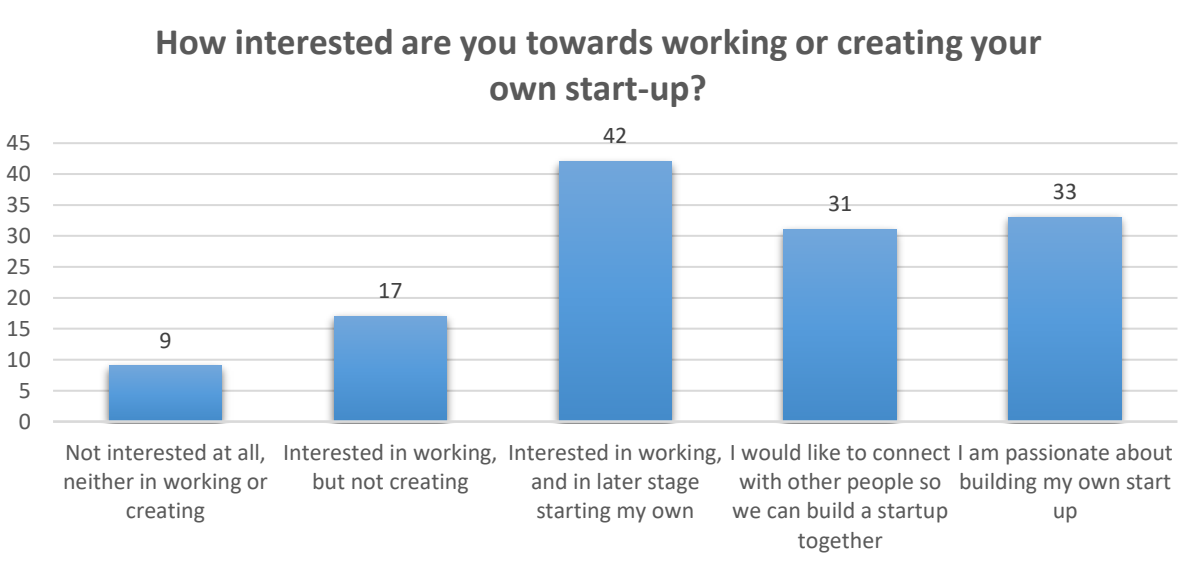


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Over 65 % of the respondents have never participated in any entrepreneurial activity so far, but on another side, **respondents have highly indicated the interest in working for a startup, founding** their own or connecting to other people in order to cofound or try some entrepreneurial activity.

STARTUP EUROPE

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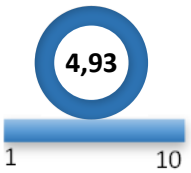
2. Awareness of entrepreneurial opportunities on University

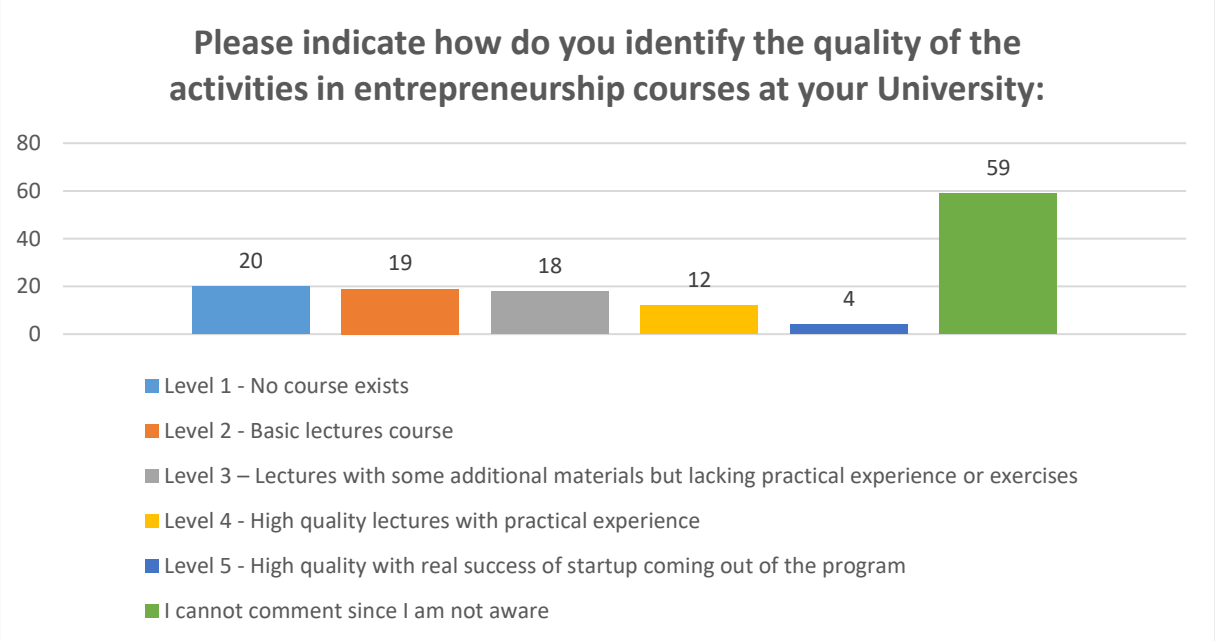
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:



Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:

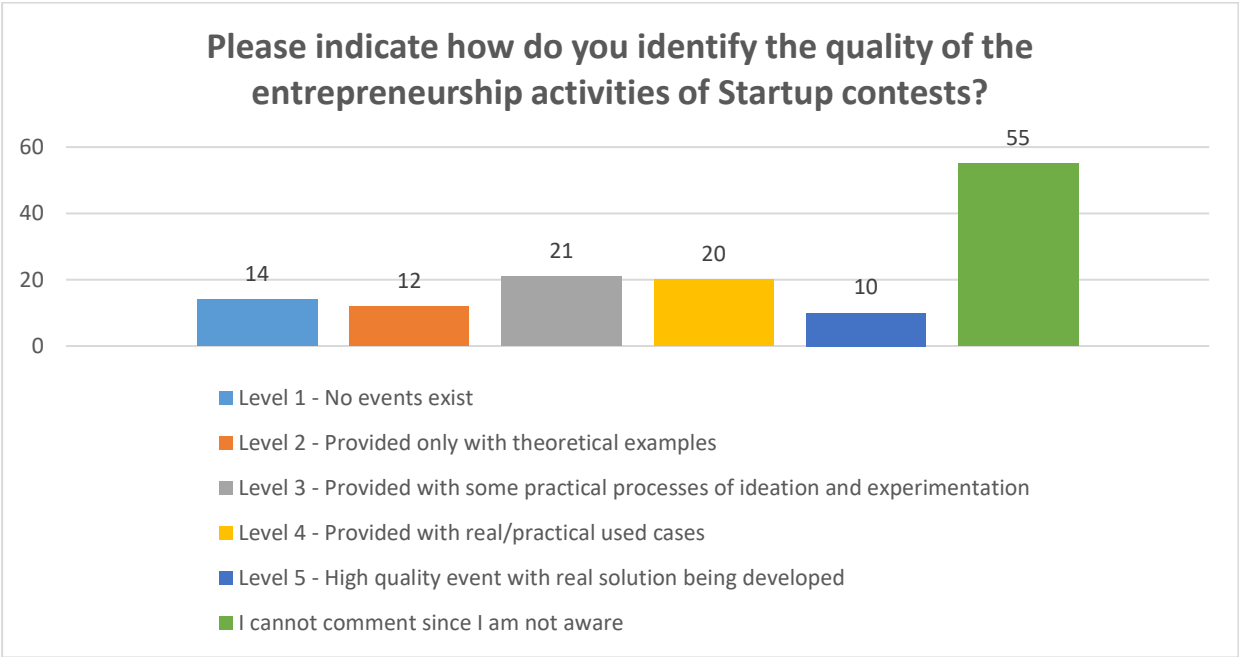


2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:

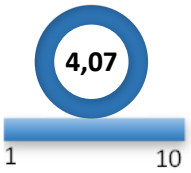
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 780758. This deliverable has not yet been officially approved by the European Commission.

Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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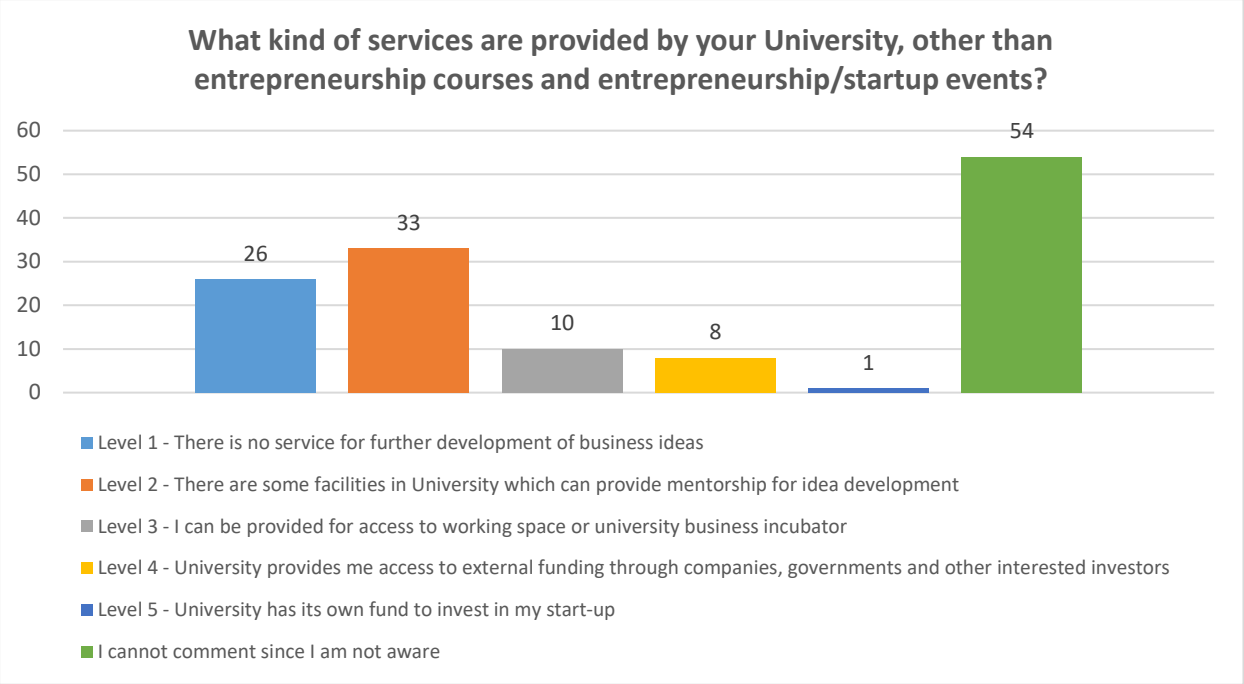
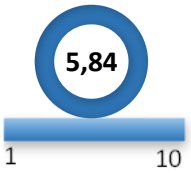
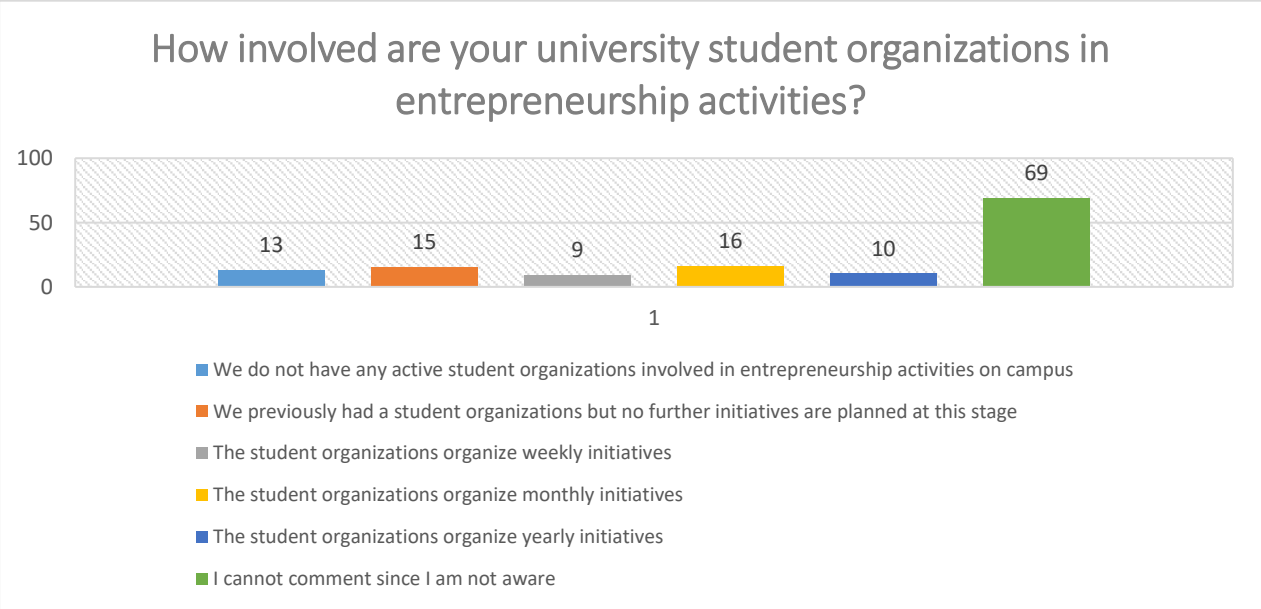


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?



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To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to take a look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

For all four questions of this output, the variable *I cannot comment since I am not aware* is medium high**, around 50%,** signalizing **medium to high level of awareness** (different from question to question) of entrepreneurship activities. After taking out this variable, and looking at the rest of the results, respondent have mainly chosen **levels 1,2 and 3 (low to medium level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities which can provide mentorship support for idea development and respondents have indicated that student organization all levels of response (again with high percentage of unawareness), the highest percentage holds the level of monthly organized entrepreneurial activities.

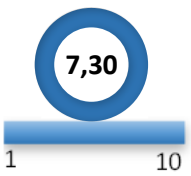
3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability.

The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



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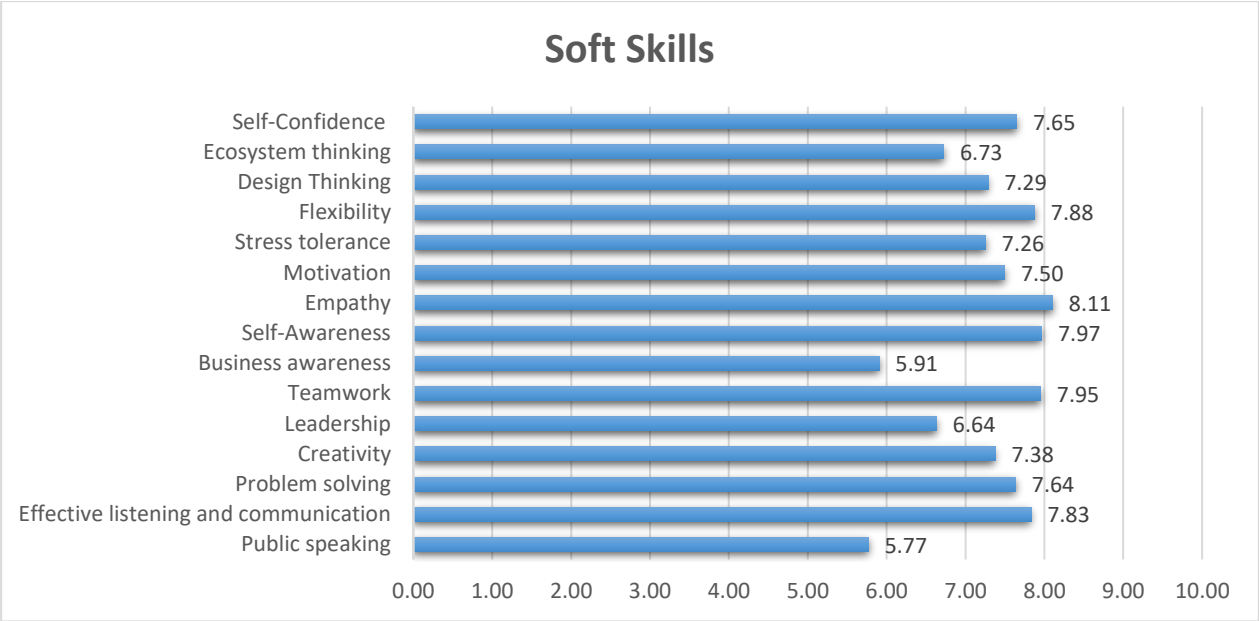
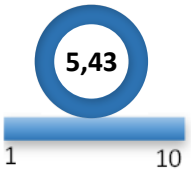
Q: Please indicate your level of confidence in the following soft skills and competences on the 5-point scale from Not Confident to Extremely Confident.



Empathy and Self-Awareness and Teamwork have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3b. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following

financial skills on the 5-point scale from Not Confident to Extremely Confident.

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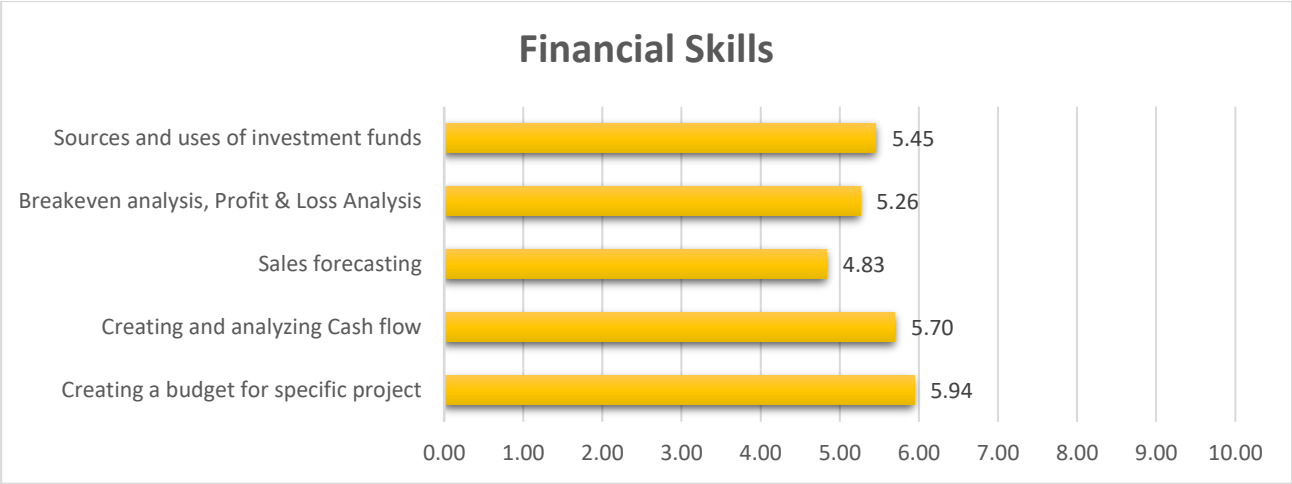
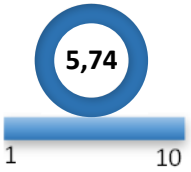


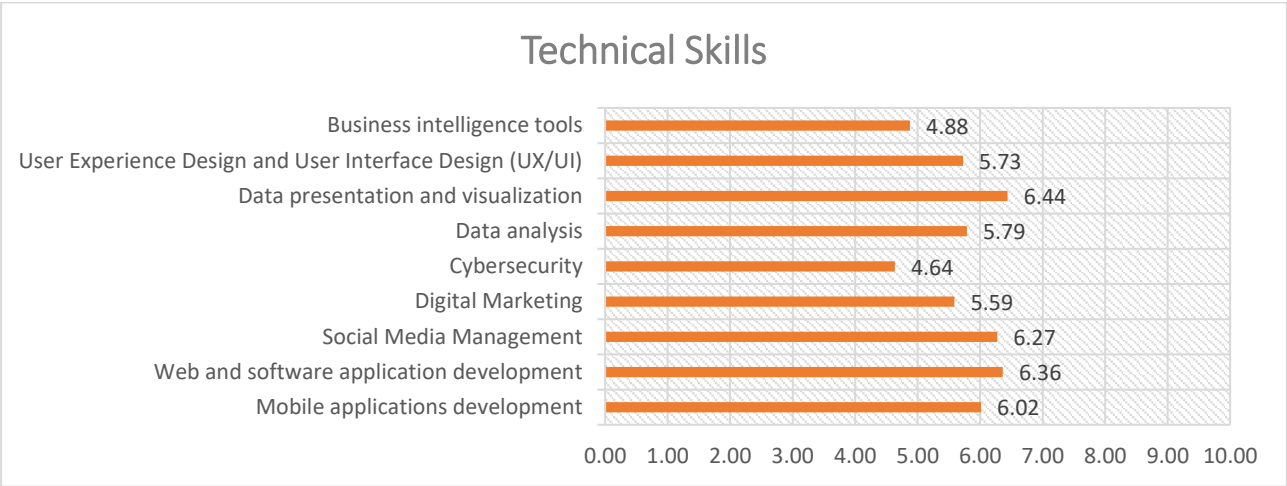
Highest overall rate selected by the respondent from the Financial skills are Creating a budget and analysing the cash flow, and lowest response rate had Sales Forecasting.

3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the 5-point scale from Not Aware to Expert user.



Highest overall rates selected by the respondent from the technical skills are Data presentation and visualization, Web and software application development are mostly selected as experienced skill, and Cybersecurity and Business Intelligence tools as the lowest rated in awareness and experience by the respondents.

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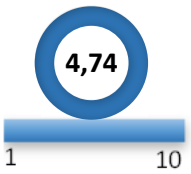
4. Usage of external learning resources

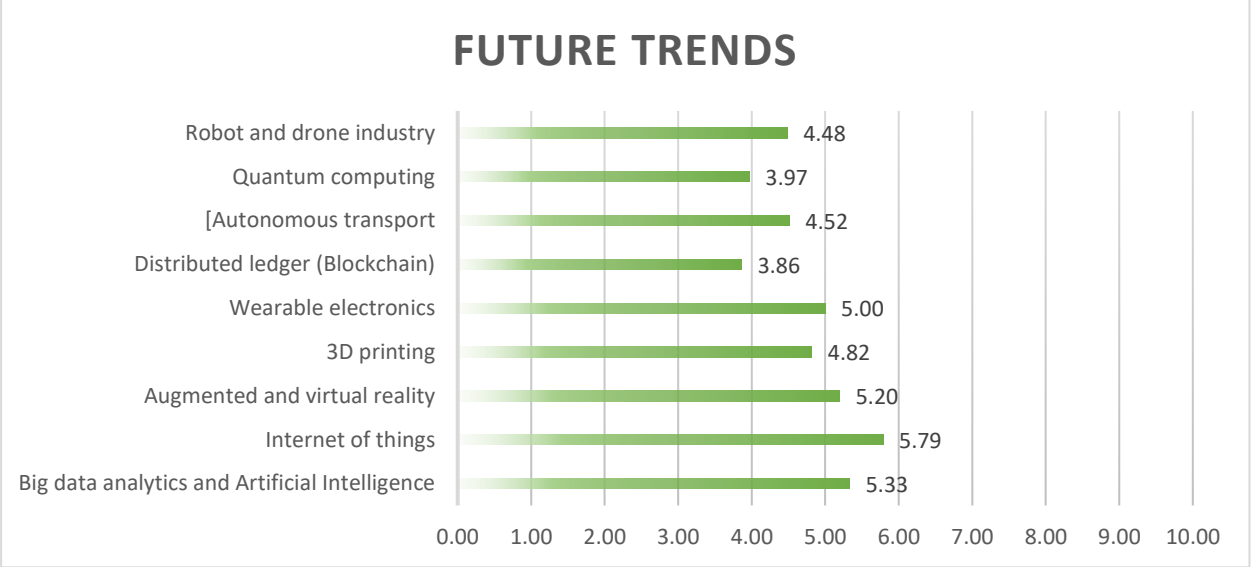
The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

4a. Future Trends

Mean Score:



Q: Please identify your awareness and knowledge of the following topics on the 5-point scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas and Internet of things, Augmented and virtual reality and Big data and AI, and least knowledgeable in BlockChain and Quantum Computing.

4b. Usage of web resources

Mean Score:

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European Commission
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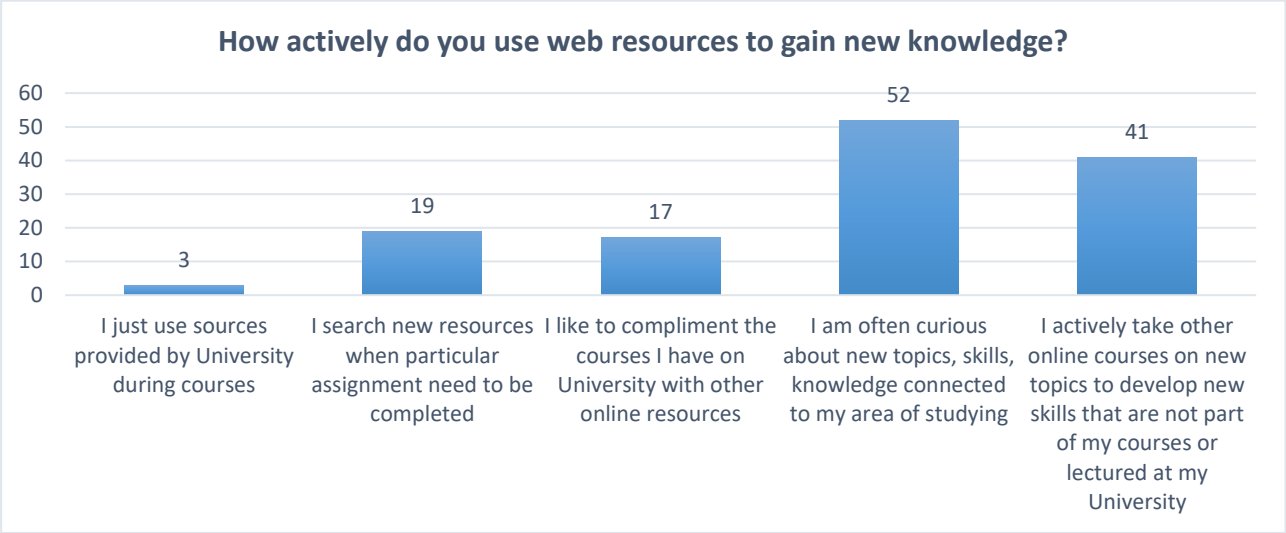
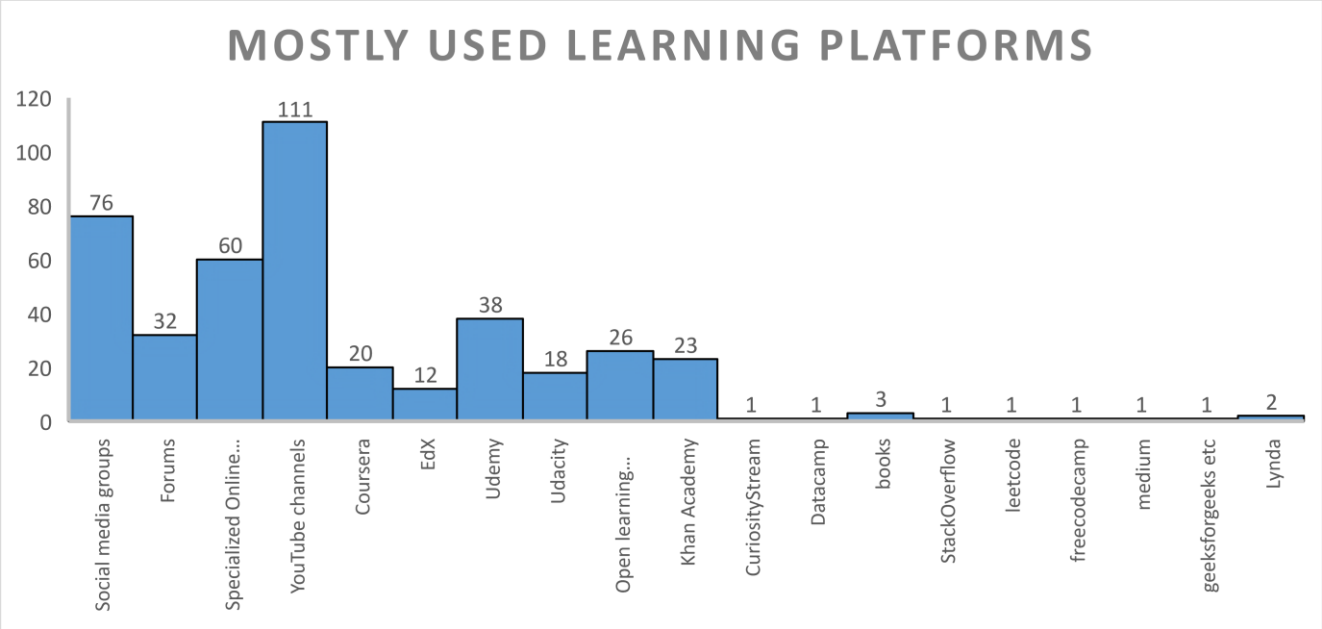
Q: How actively do you use web resources to gain new knowledge?



High response rate of students indicates an often curiosity and update on the knowledge connected to the study area, and as well use online courses to develop new skills and topics not connected to curriculum.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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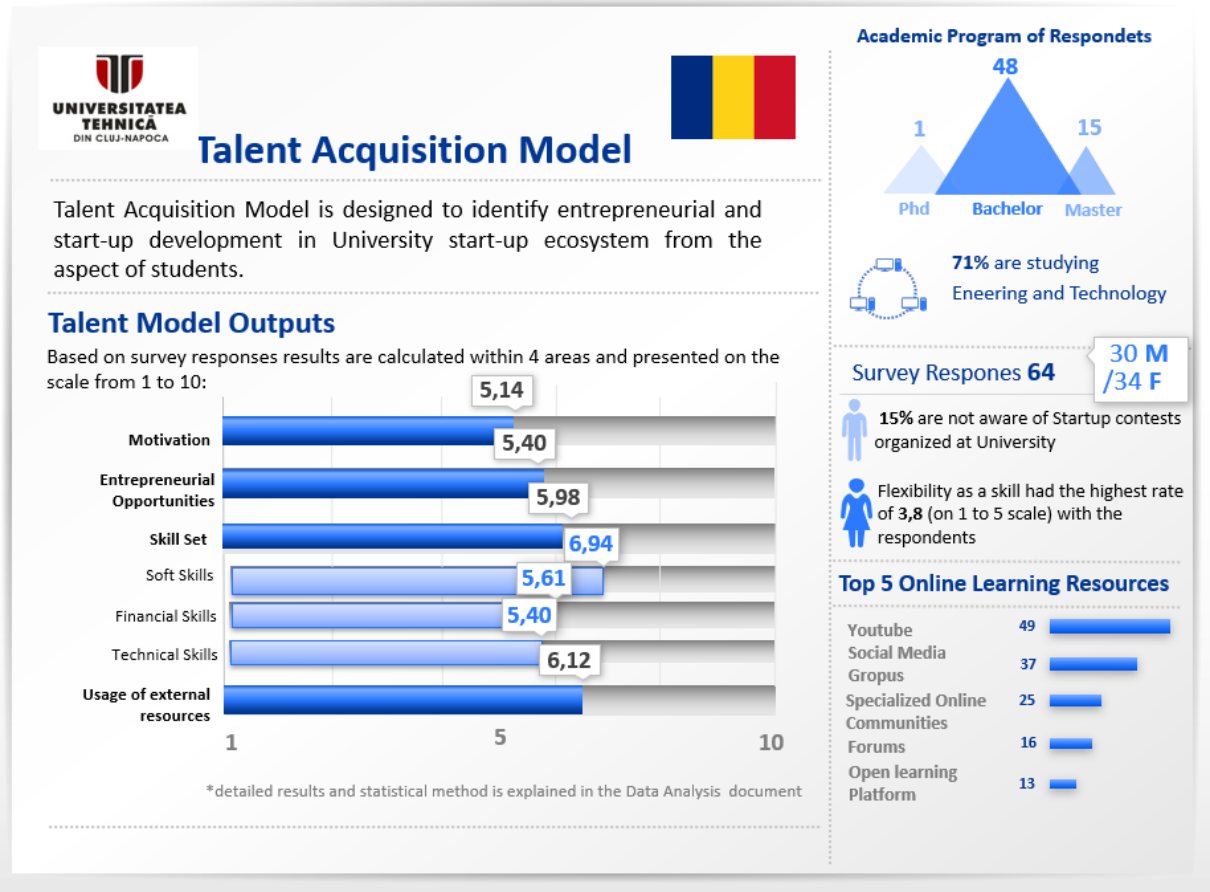
7.2.3 . Technic University (UTCN)



Talent Acquisition Model
Data Analysis of the Survey

UNIVERSITATEA TEHNICĂ DIN CLUJ-NAPOCA

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

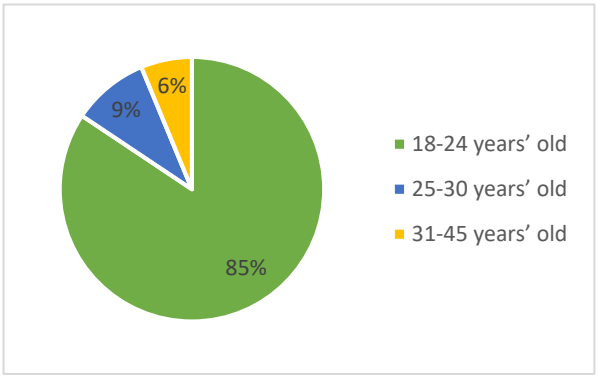
From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

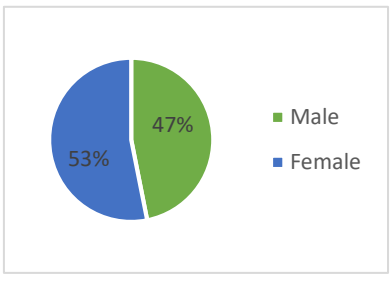
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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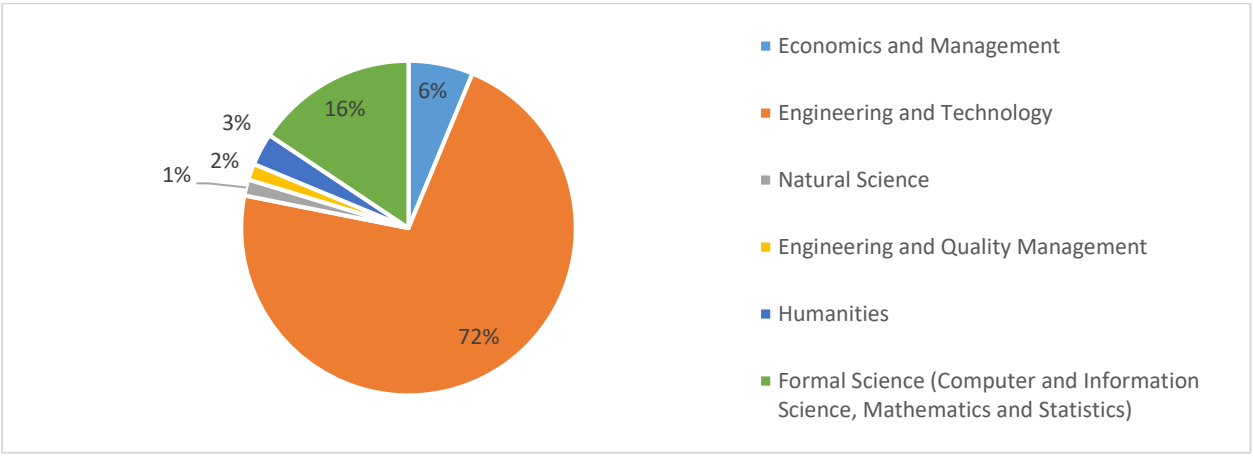
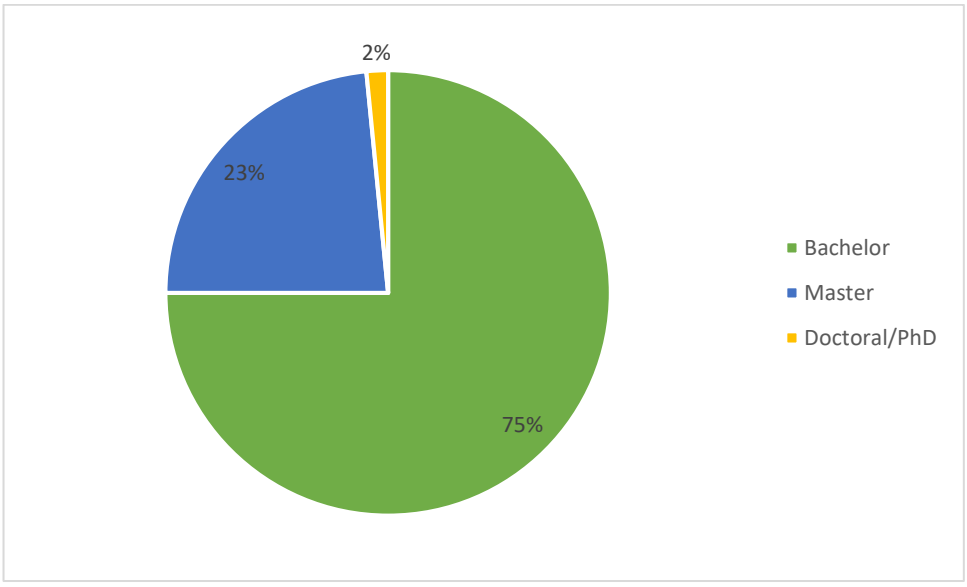
Academic disciplines:



Level of Studying:



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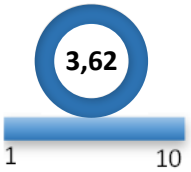
1. Motivation towards Entrepreneurship

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



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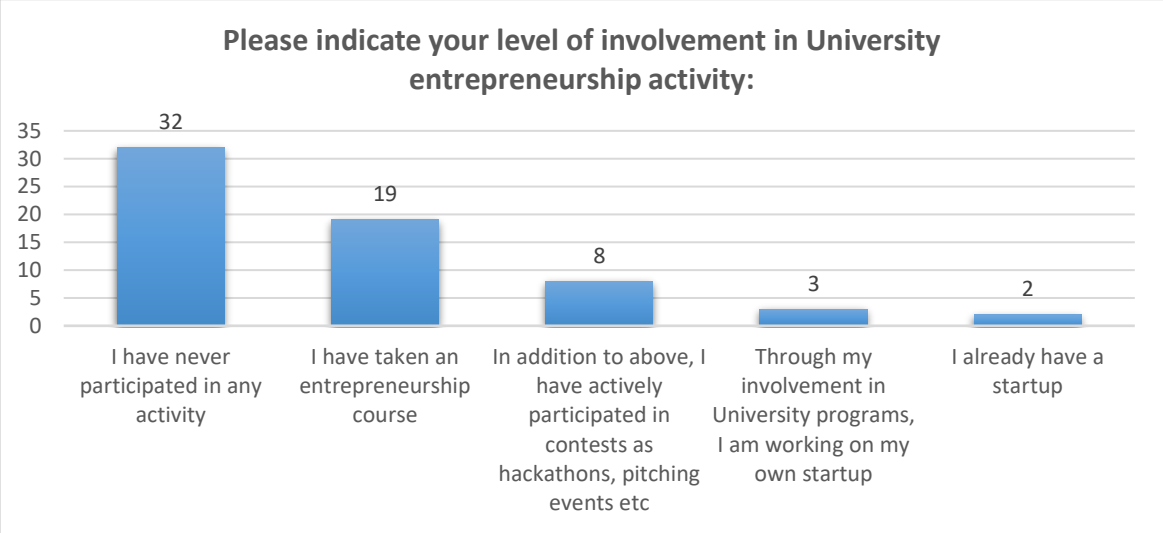
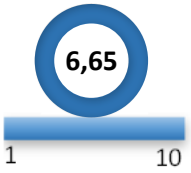
Q: Please indicate your level of involvement in University entrepreneurship activity:

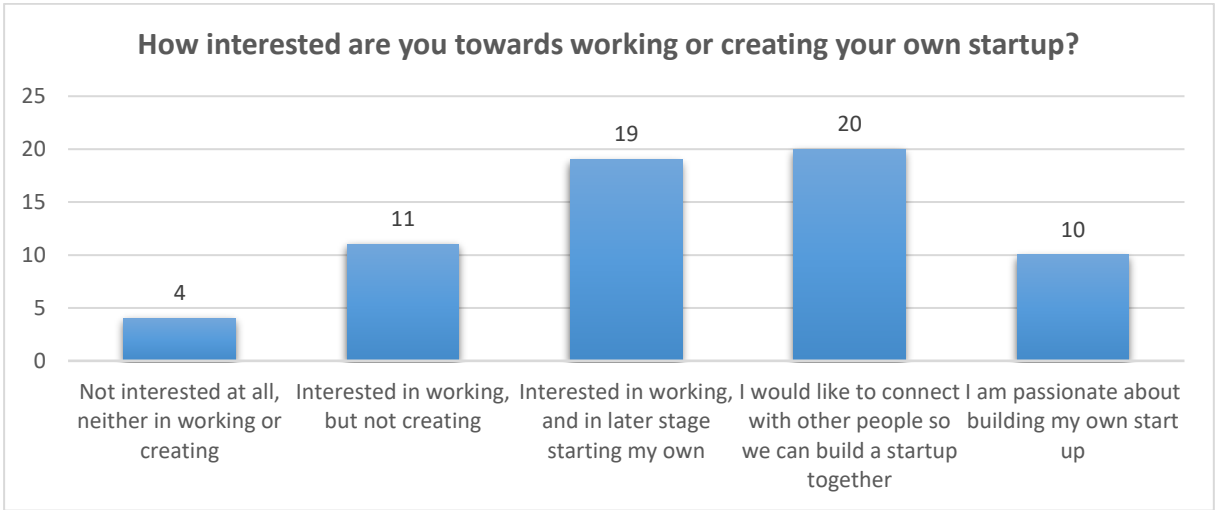


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Over 49% of respondents have never participated in any entrepreneurship activity. But on another side, **respondents have highly indicated** the interest in **working for a startup, founding their own** or connecting to other people in order to cofound or try some entrepreneurial activity.

STARTUP EUROPE

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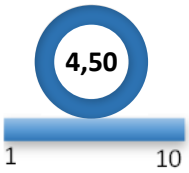
2. Awareness of entrepreneurial opportunities on University

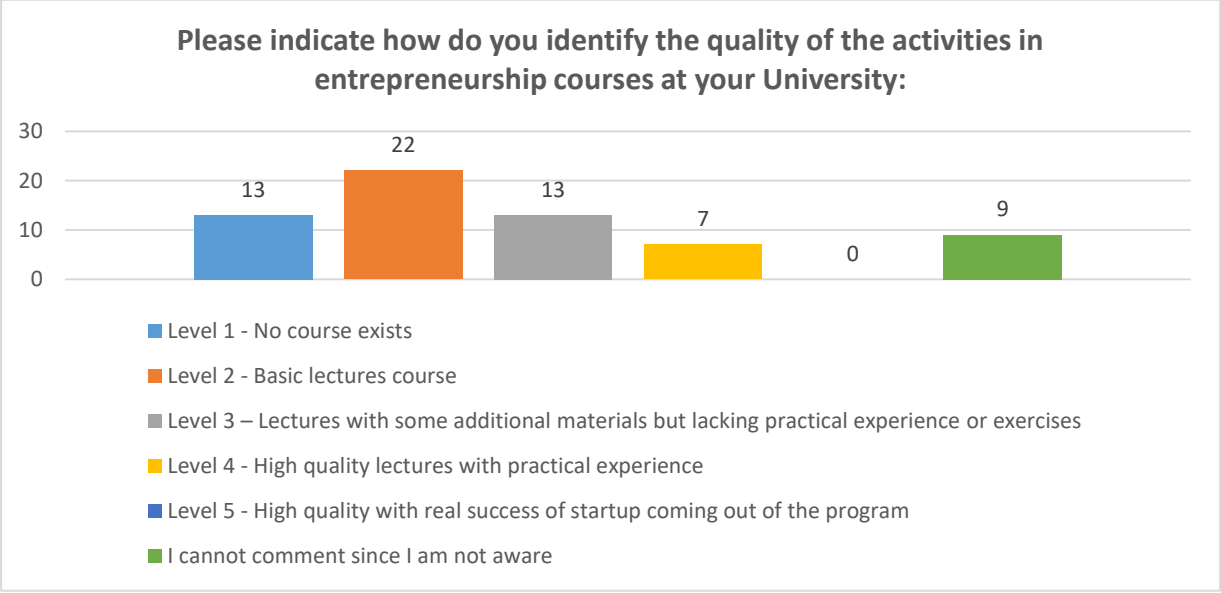
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:

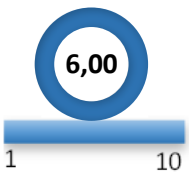


Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:



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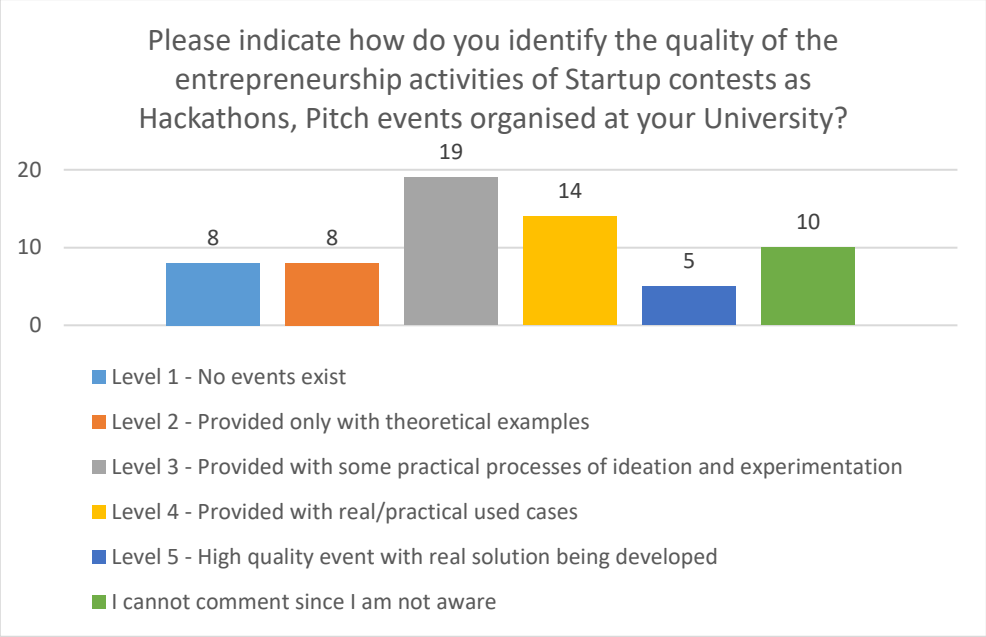
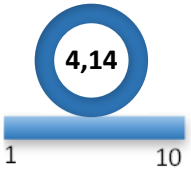
Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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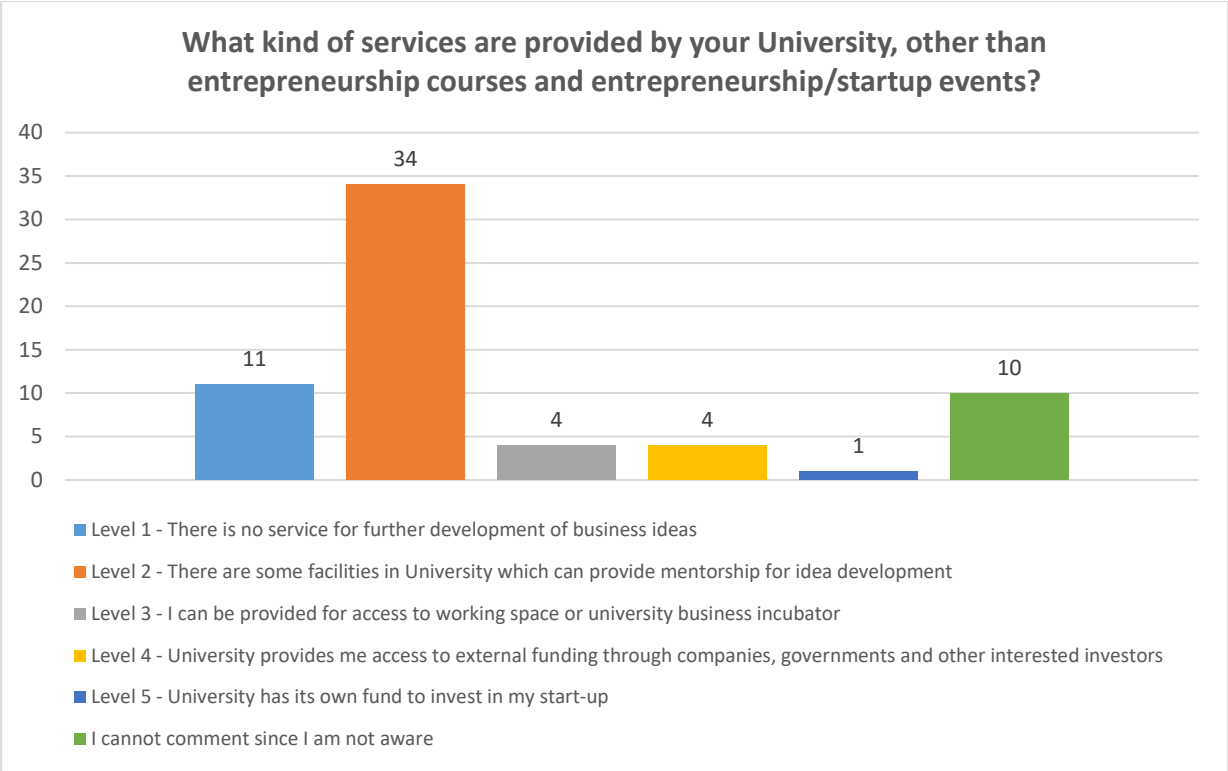
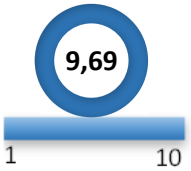


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?

STARTUP EUROPE

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To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

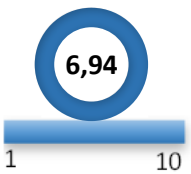
For all four questions of this output, the variable *I cannot comment since I am not aware* ***is low*** **(around 16%), signalizing the respondents are highly informed about entrepreneurial activities** on the campus. After taking out this variable, and observing the rest of the results, respondent have mainly chosen levels **2, 3 and 4 (low to medium level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities which can provide mentorship support. Respondents have indicated (again with high percentage of unawareness), that the student organizations mostly have weekly initiatives and yearly.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.

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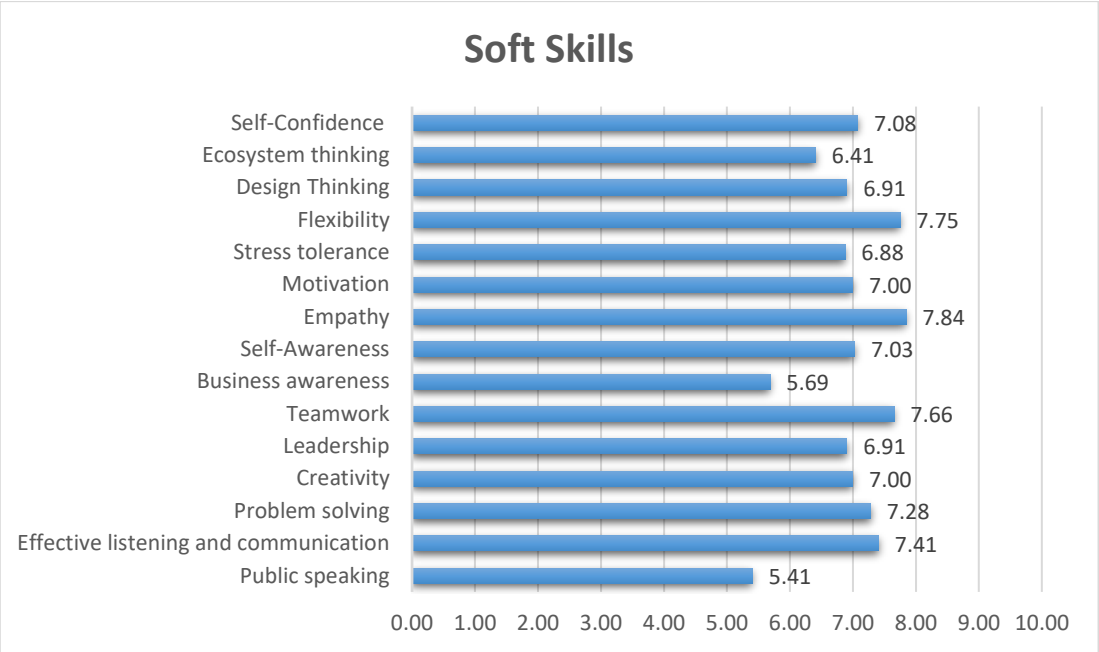
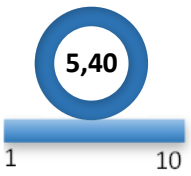


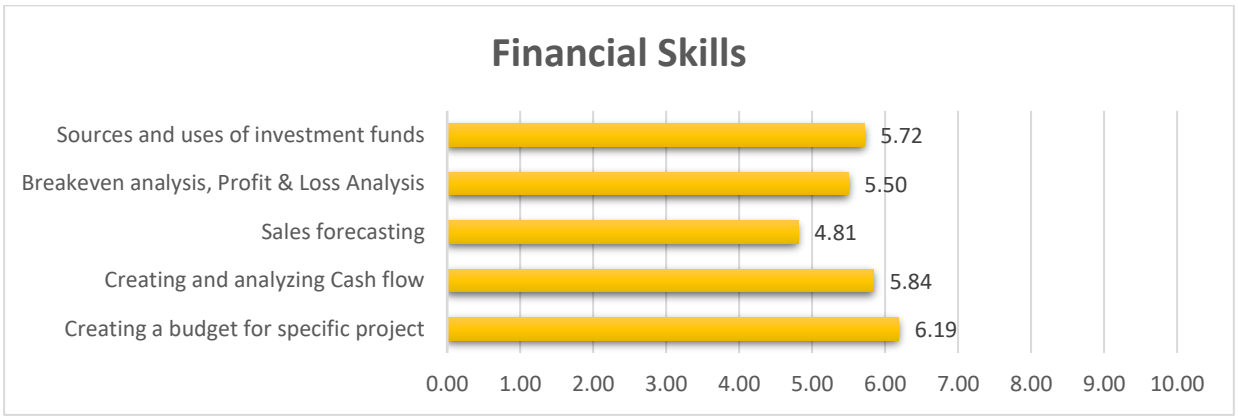
Empathy, Flexibility and Self-Awareness have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3b. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.



Highest overall rate selected by the respondent from the financial skills are Sources and uses of investment funds and Creating a budget, and lowest response rate had Sales Forecasting.

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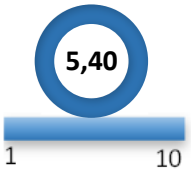
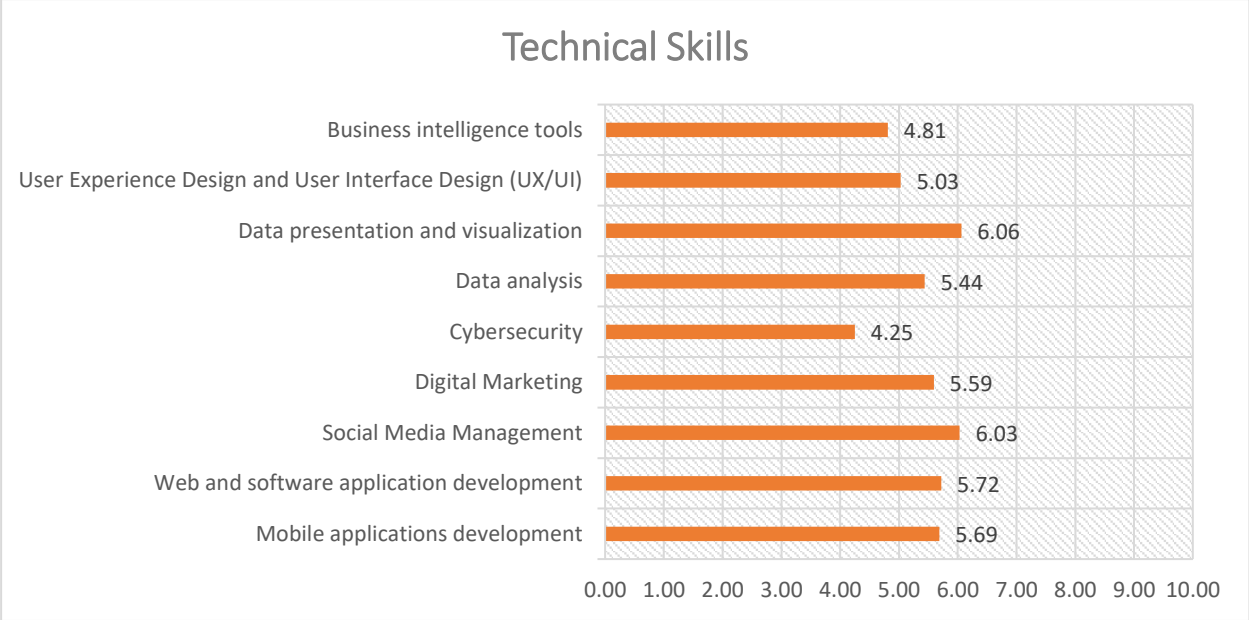
3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Highest overall rate selected by the respondent from the technical skills are Social Media Management and Web and Data presentation and visualization are mostly selected as experienced skills among respondents, and Cybersecurity and User Experience Design as the lowest rated in awareness and experience by the respondents.

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4. Usage of external learning resources

The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

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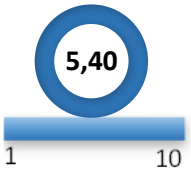
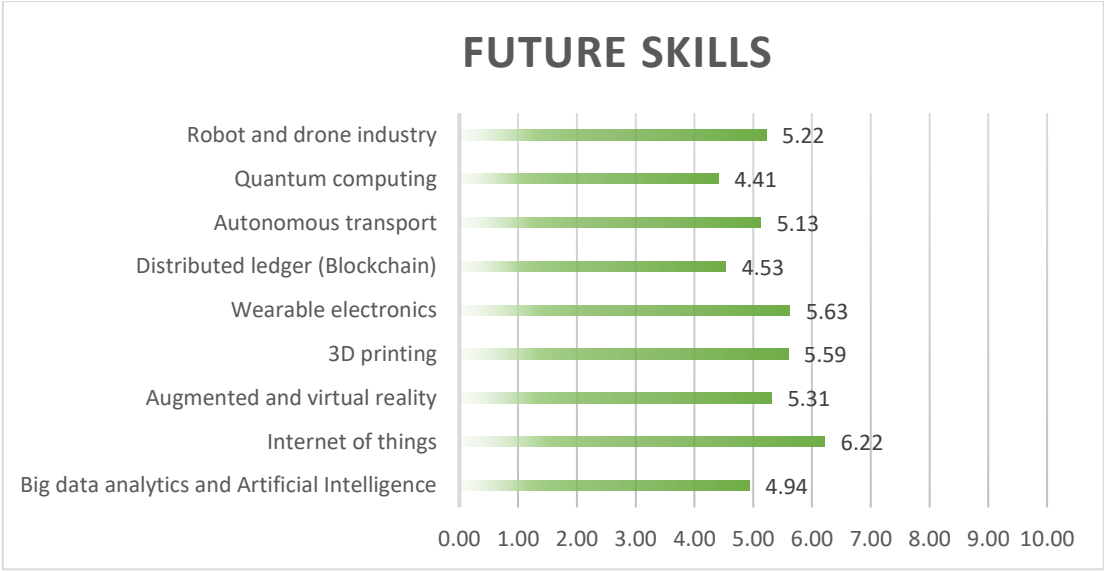
4a. Future Trends

Mean Score:



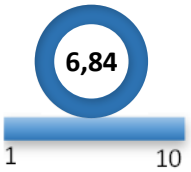
Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas of Internet of Things and Wearable electronics, and least knowledgeable in Blockchain and Quantum Computing.

4b. Usage of web resources

Mean Score:



Q: How actively do you use web resources to gain new knowledge?

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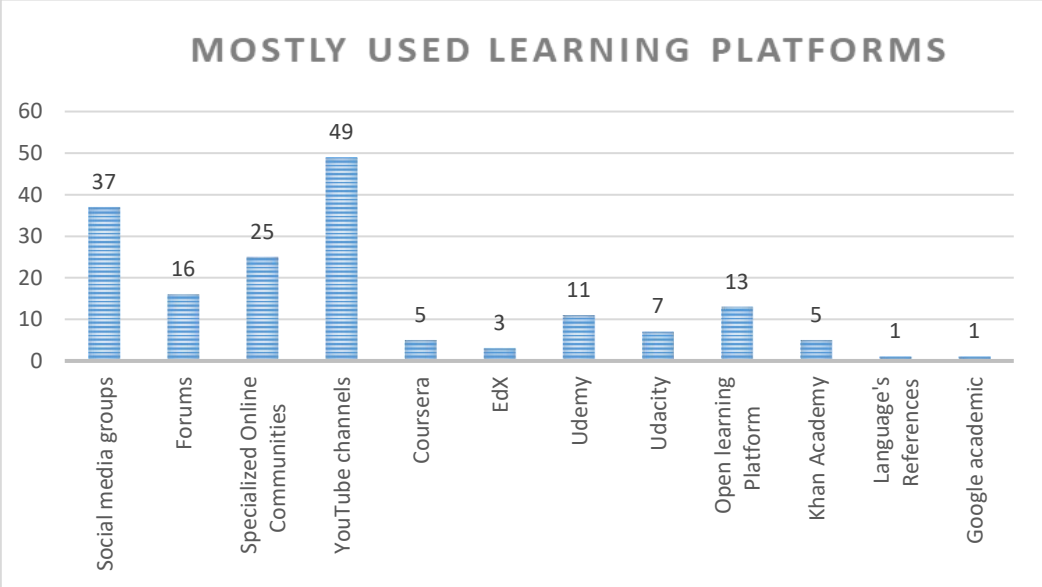
High response rate of students indicates use of online courses to develop new skills and topics not connected to curriculum and an often curiosity and update on the knowledge connected to the study area.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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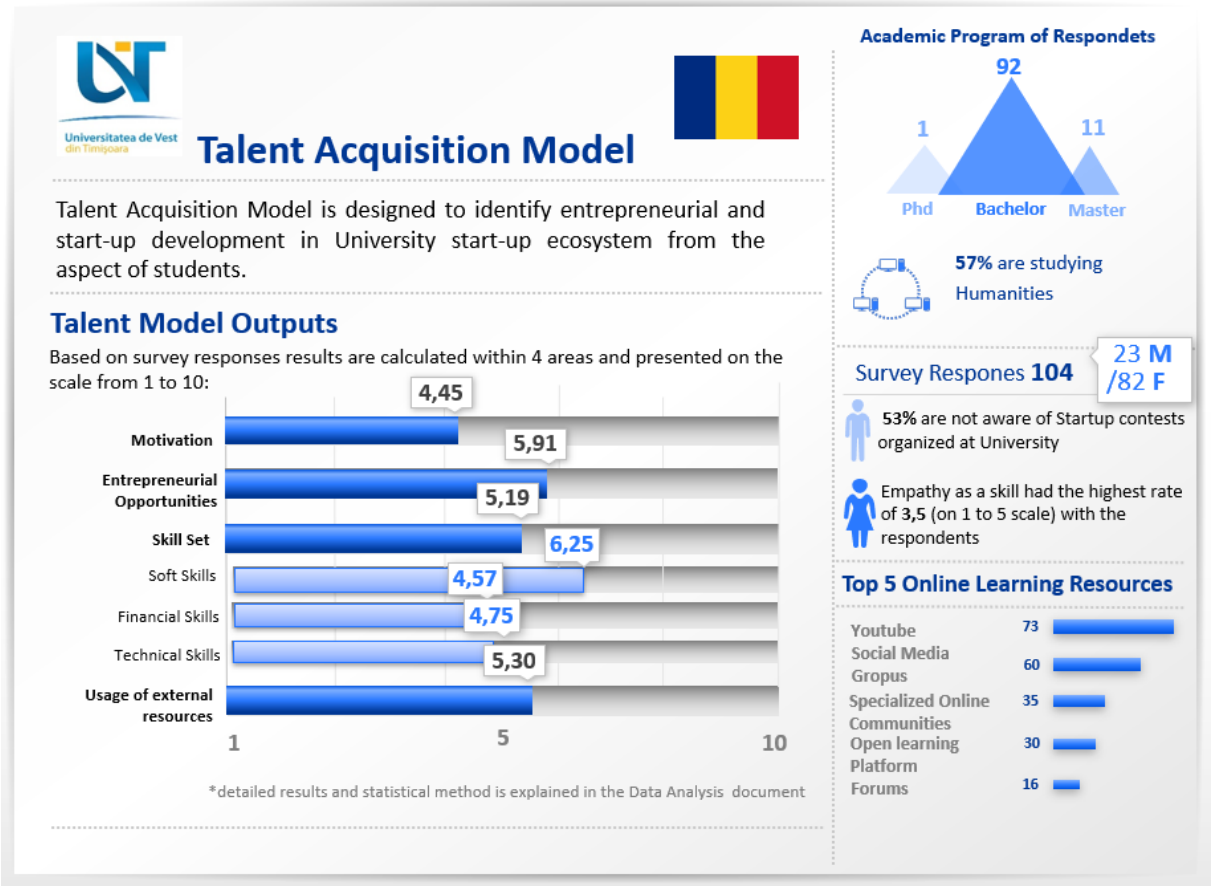
7.2.4. West University of Timisoara (UVT)



Talent Acquisition Model
Data Analysis of the Survey

Universitatea de Vest din Timişoara

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

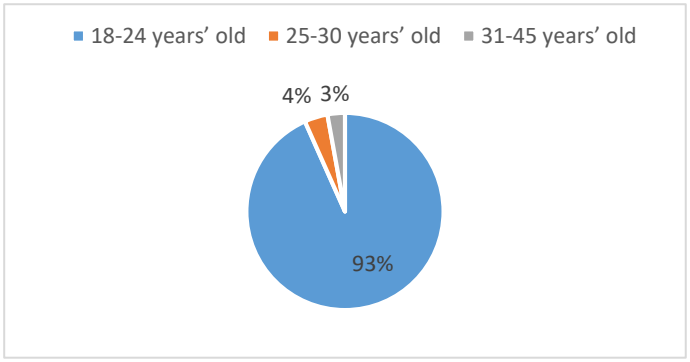
From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

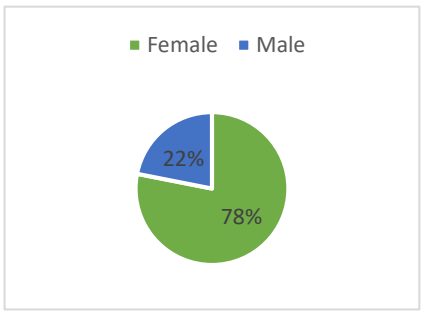
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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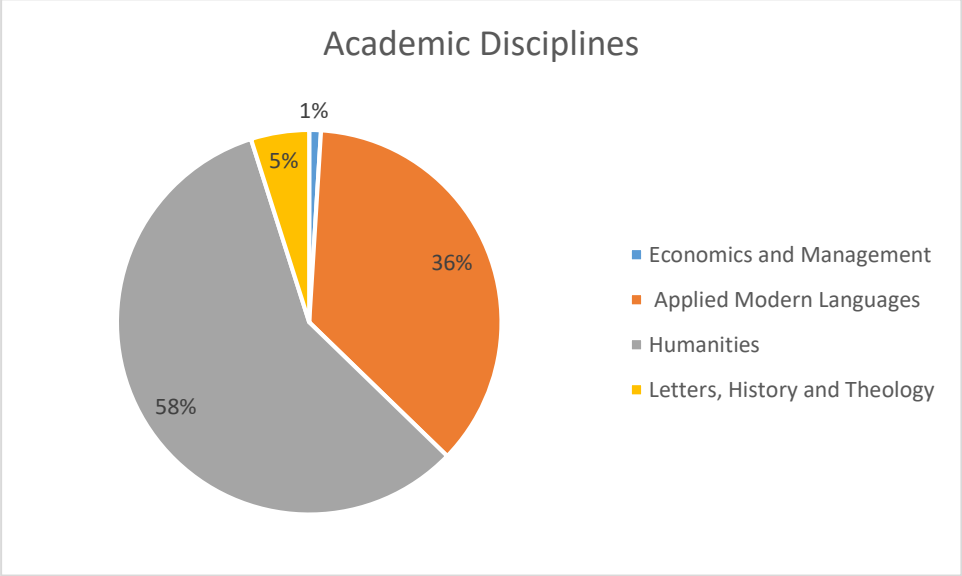
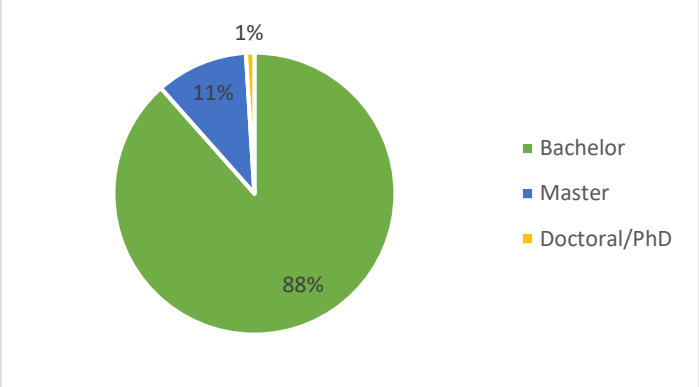
Academic disciplines:



Level of Studying:



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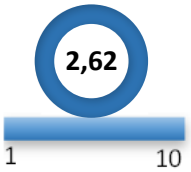
1. **Motivation towards Entrepreneurship**

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



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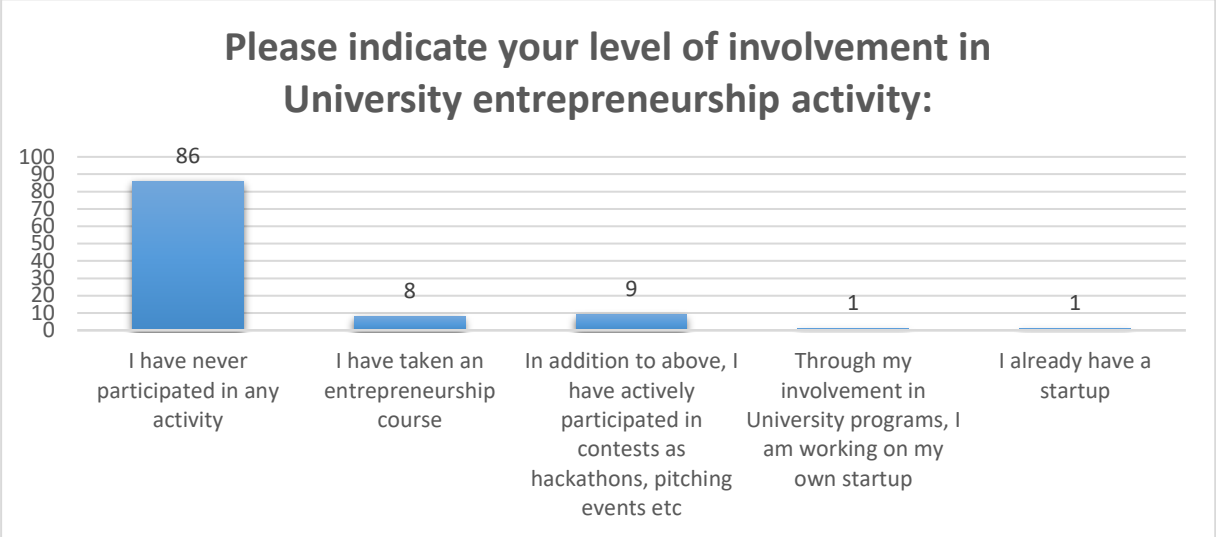
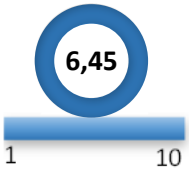
Q: Please indicate your level of involvement in University entrepreneurship activity:

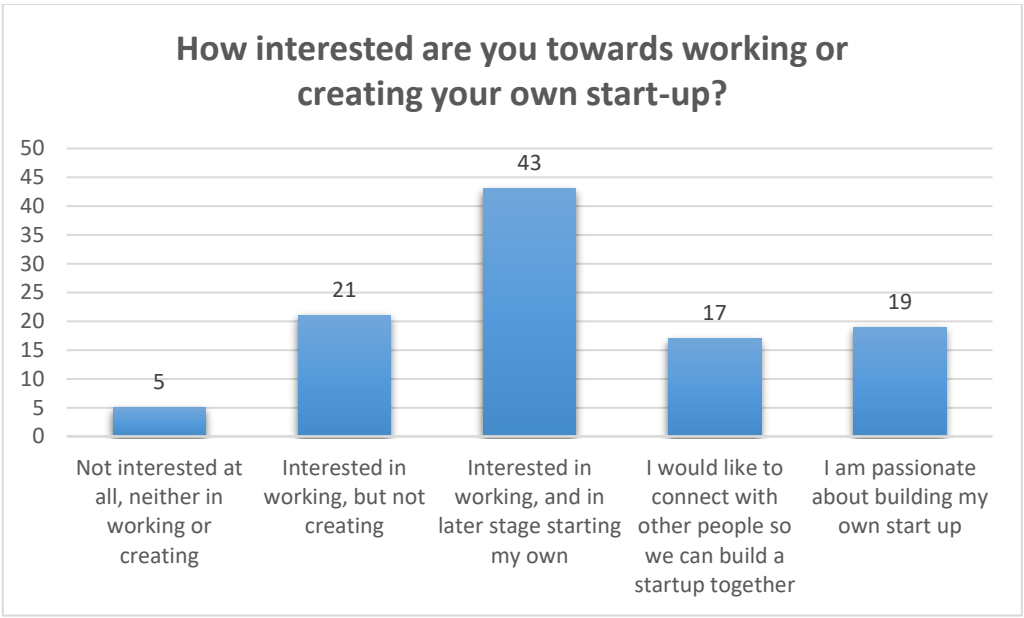


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



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Majority of respondents **(81%) have never participated** in any entrepreneurship activity. But on another side, **respondents have highly indicated** the interest in **working for a startup, founding their own** or connecting to other people in order to cofound or try some entrepreneurial activity.

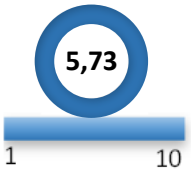
---

2. Awareness of entrepreneurial opportunities on University

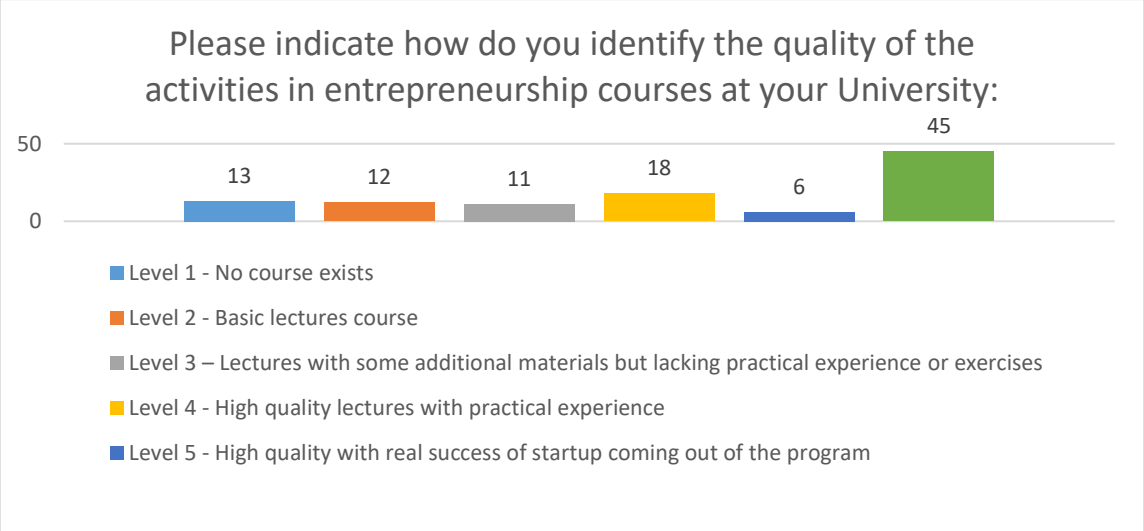
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:



Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



2b. Quality of the entrepreneurship activities of Startup contests

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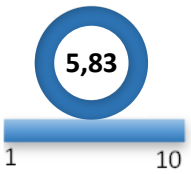
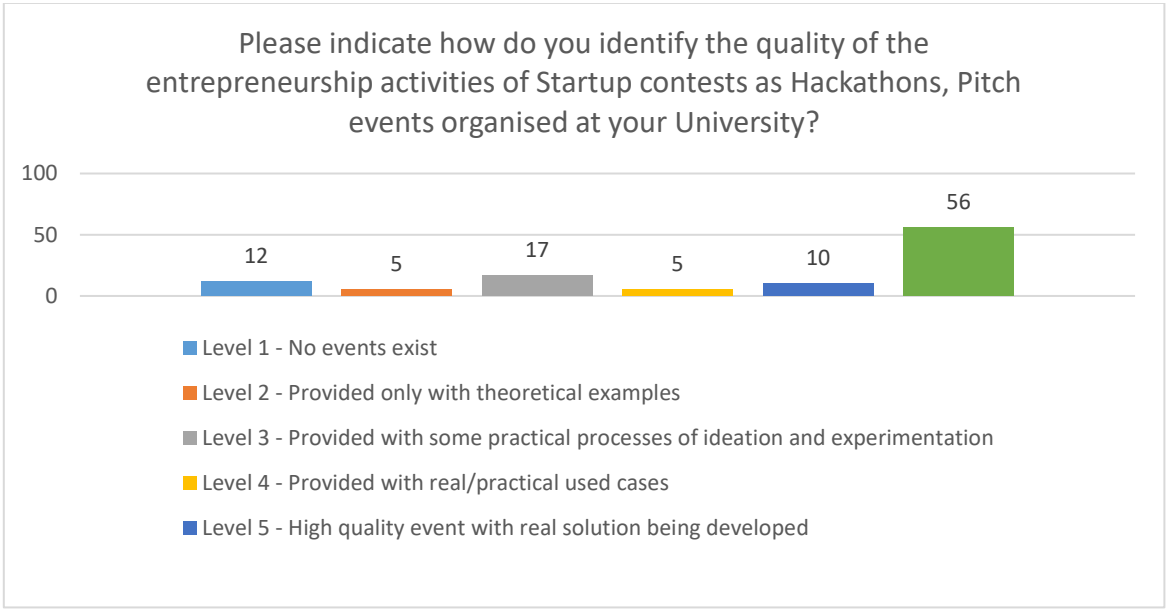
Mean Score:

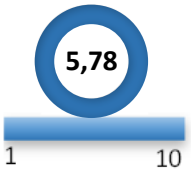


Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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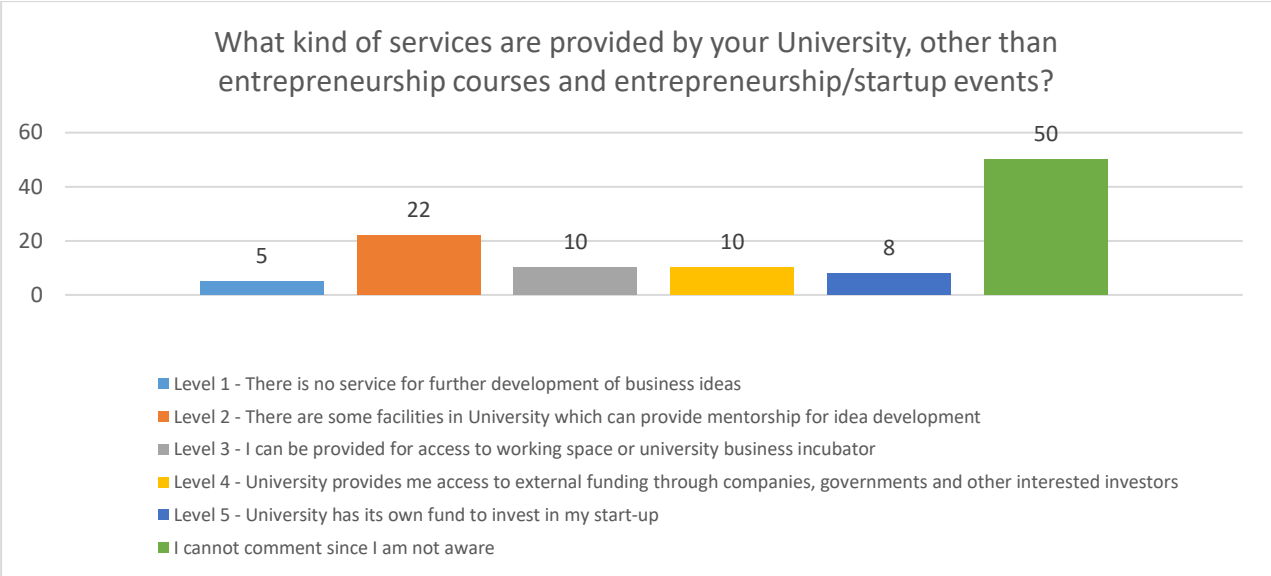
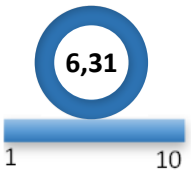


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?

To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order

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to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further develop awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and so please be advised to look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

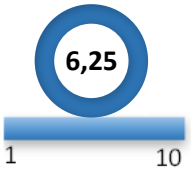
For all four questions of this output, the variable *I cannot comment since I am not aware* is medium high **(around 50%),** signalizing **medium level of awareness of entrepreneurial activities**. After taking out this variable, and observing the rest of the results, respondent have mainly chosen **levels 2, 3 and 4 (low to medium level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities which can provide mentorship support and access to working space and business incubators and funding. Respondents have indicated (again with high percentage of unawareness), that the student organizations have mostly weekly initiatives.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.

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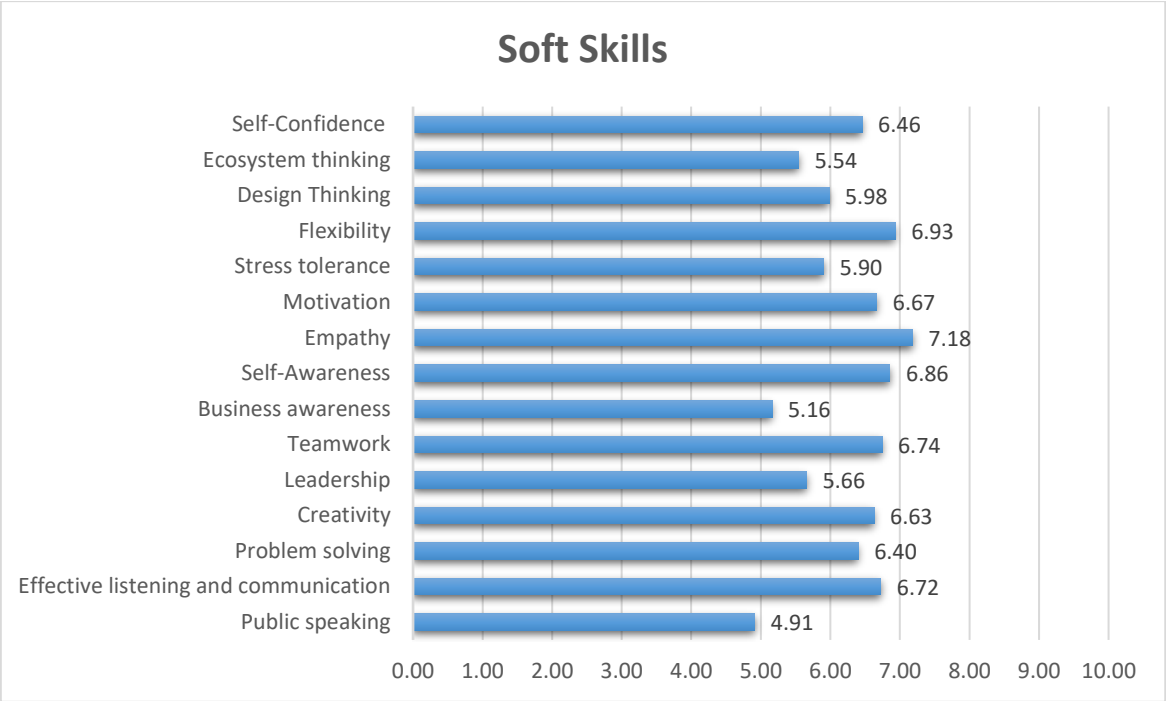
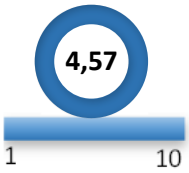


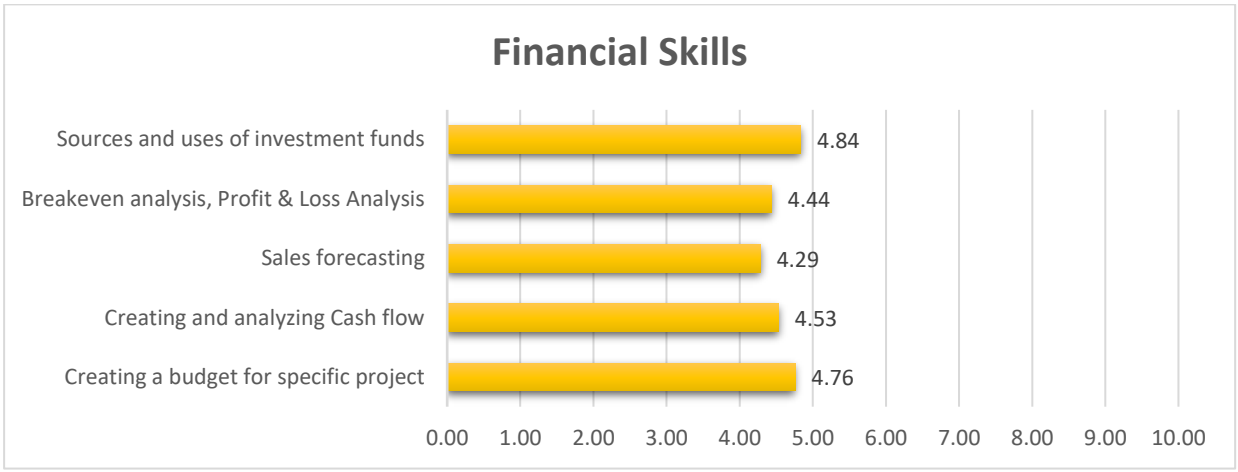
Empathy, Flexibility and Self-Awareness have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3b. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.



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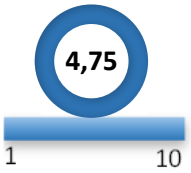
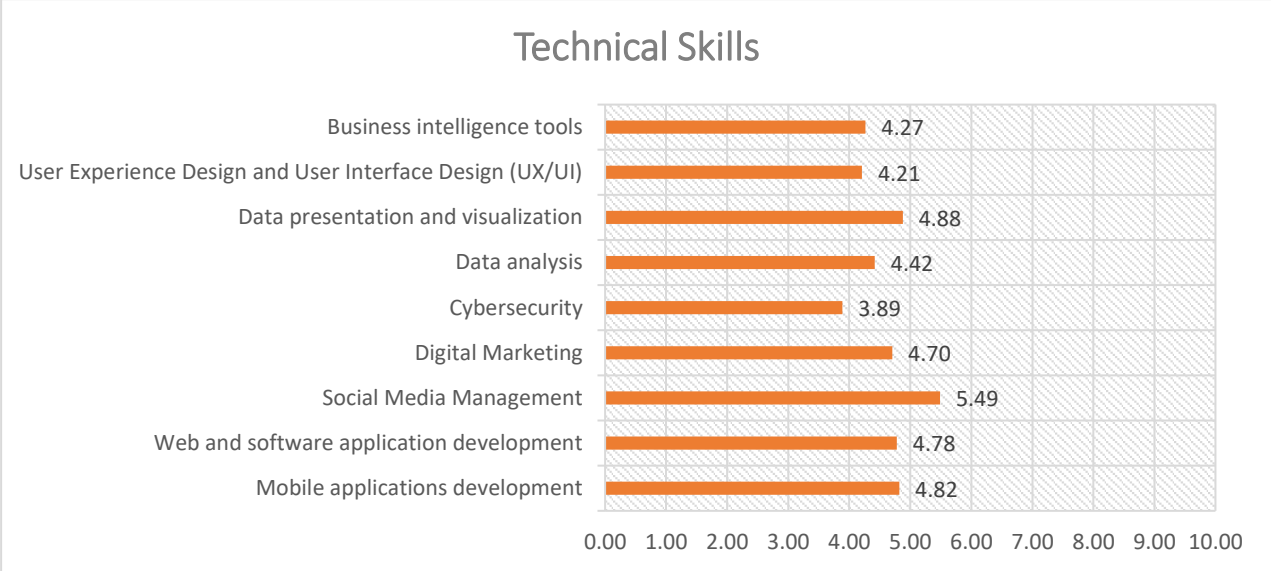
Highest overall rate selected by the respondent from the financial skills are Sources and uses of investment funds and Creating a budget, and lowest response rate had Sales Forecasting.

3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Highest overall rates selected by the respondent from the technical skills are Social Media Management and Web and Data presentation and visualization as experienced skills among respondents, and Cybersecurity and User Experience Design as the lowest rated in awareness and experience by the respondents.

4. Usage of external learning resources

The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

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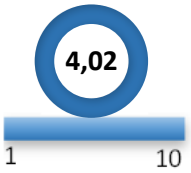
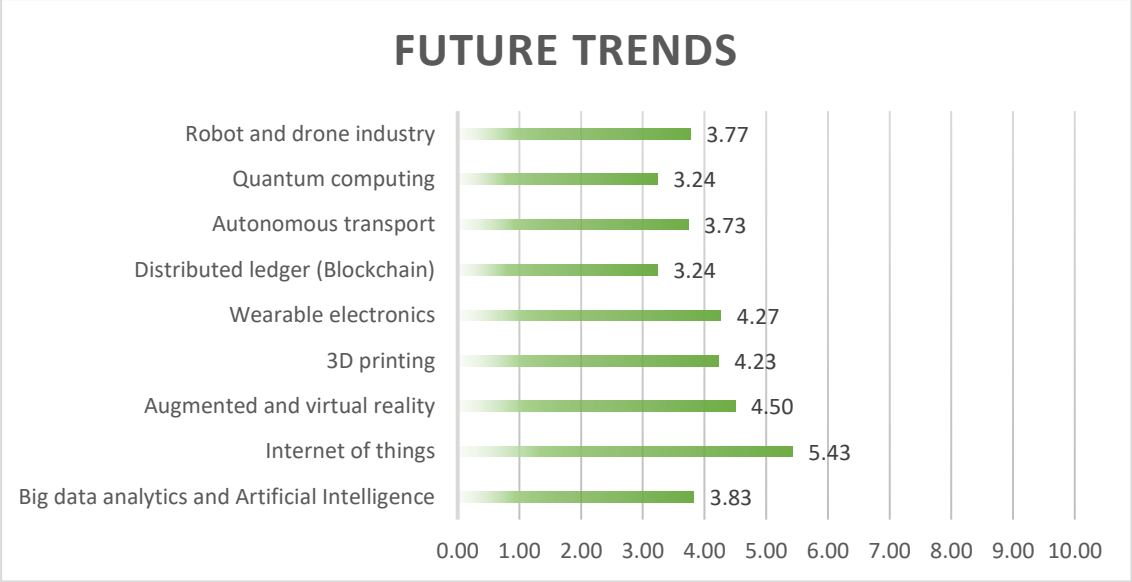
4a. Future Trends

Mean Score:



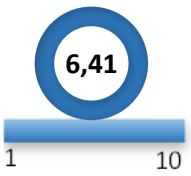
Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas of Internet of Things and Augmented and Virtual reality, and least knowledgeable in Blockchain and Quantum Computing and Autonomous transport.

4b. Usage of web resources

Mean Score:



Q: How actively do you use web resources to gain new knowledge?

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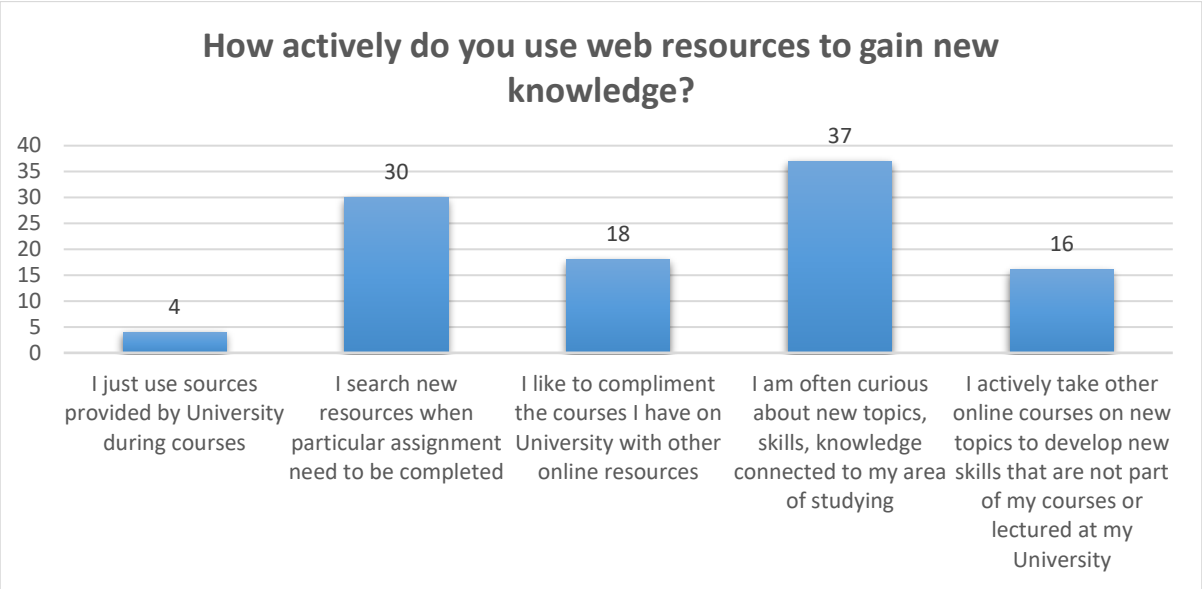
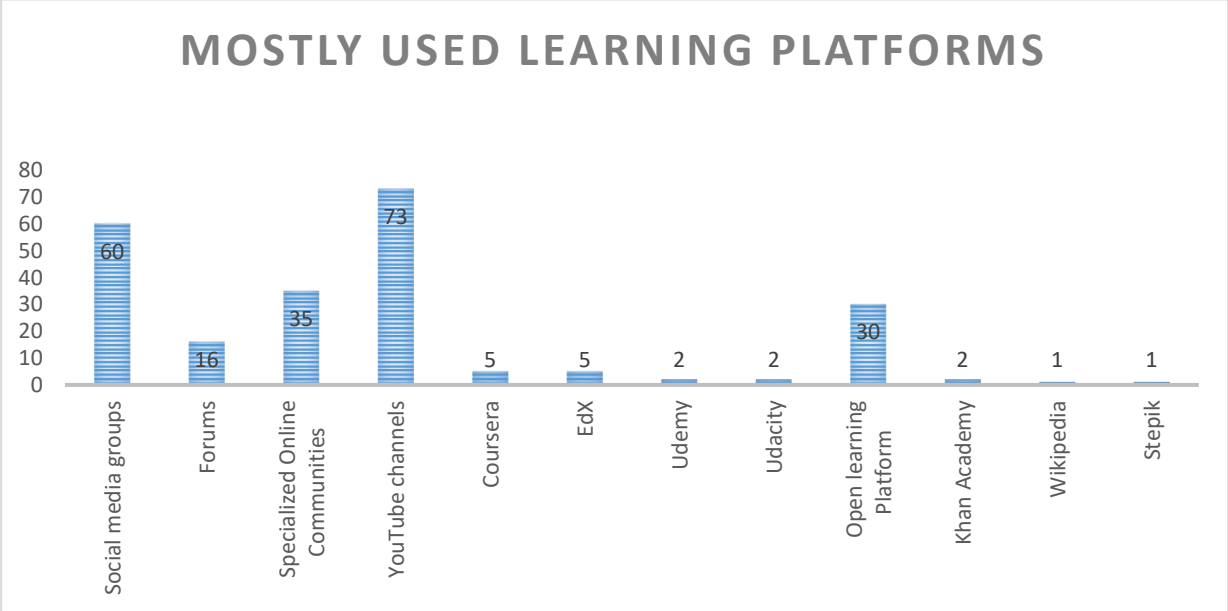


High response rate of students indicates use of online courses to develop new skills and topics not connected to curriculum and an often curiosity and update on the knowledge connected to the study area.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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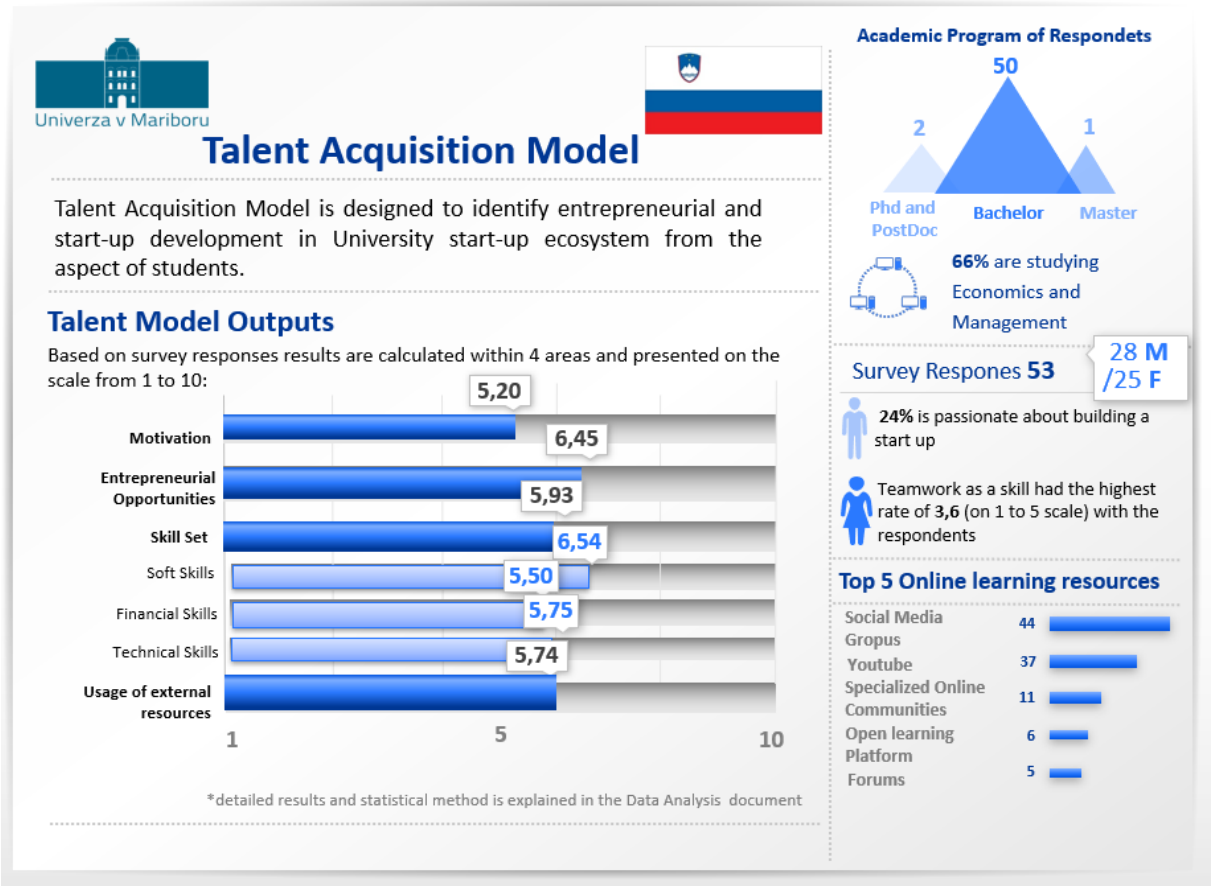
7.3. Slovenia

7.3.1. University of Maribor



Talent Acquisition Model
Data Analysis of the Survey

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

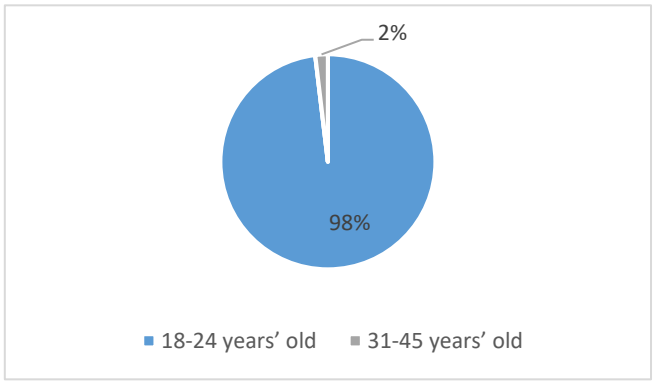
From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

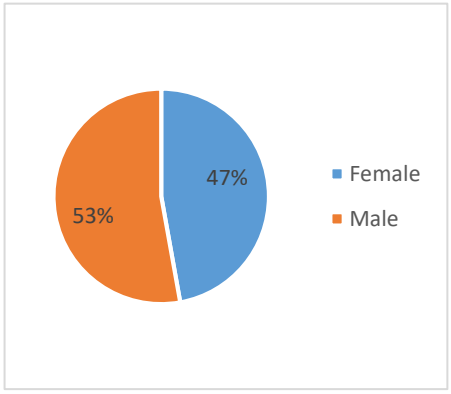
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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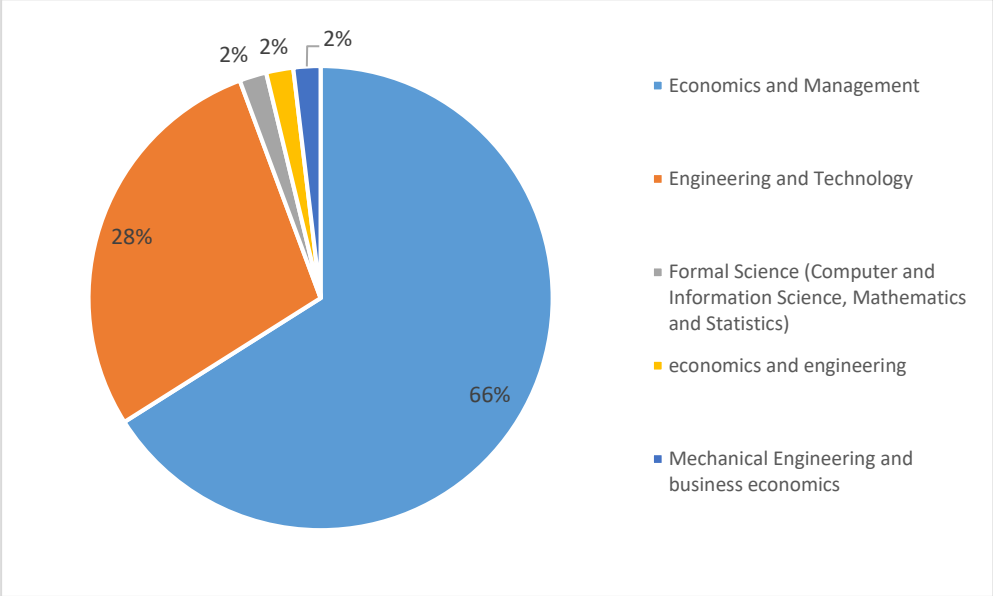
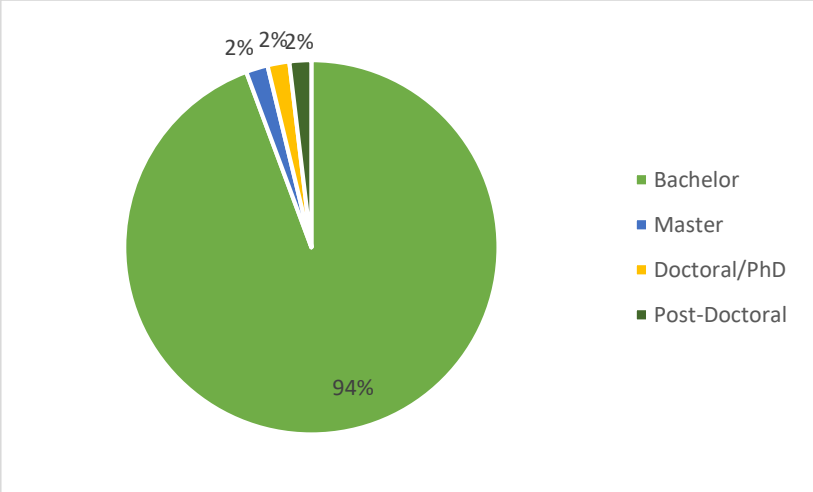
Academic disciplines:



Level of Studying:



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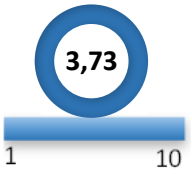
1. Motivation towards Entrepreneurship

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



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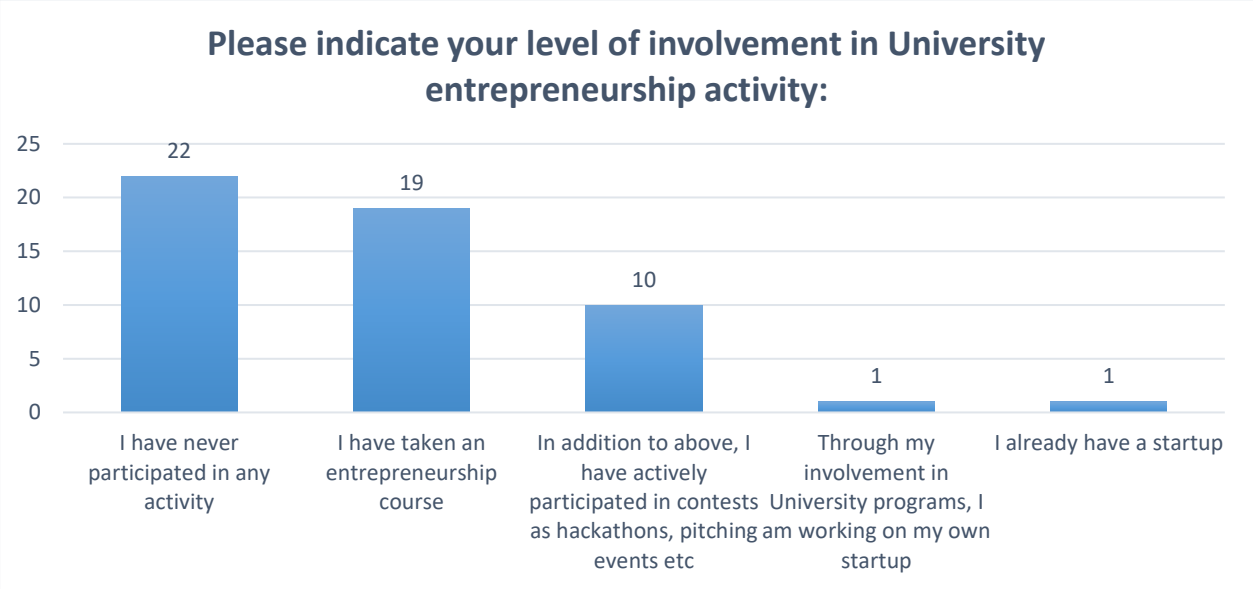
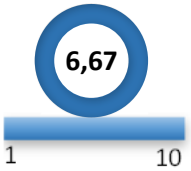
Q: Please indicate your level of involvement in University entrepreneurship activity:

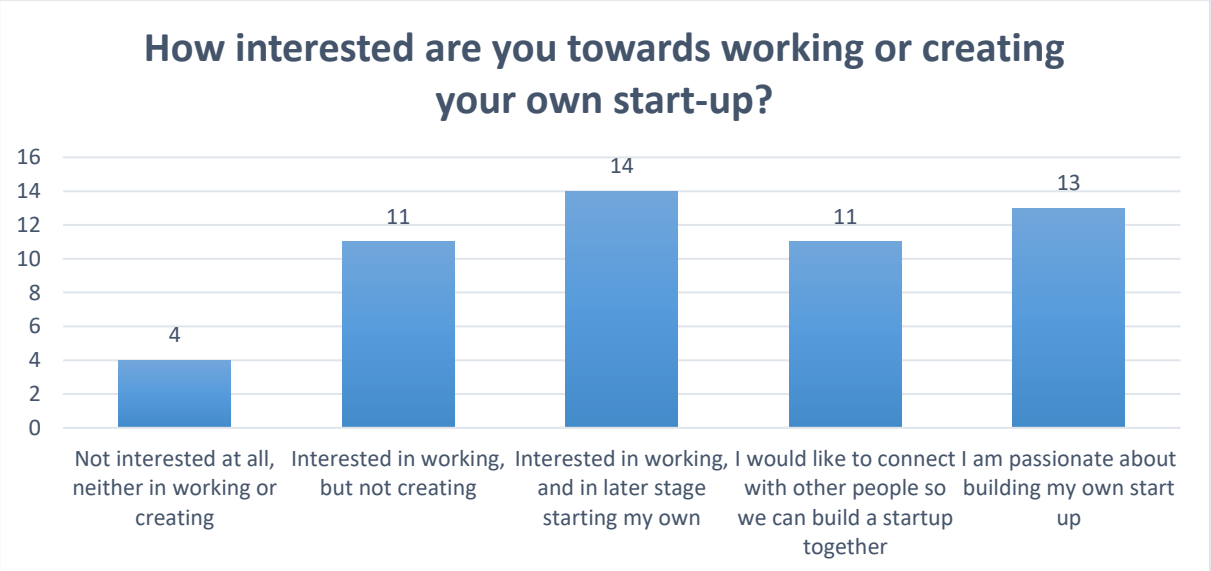


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Over 40% of respondents have never participated in any entrepreneurial activity so far, but on another side, **respondents have highly indicated the interest in working for a**

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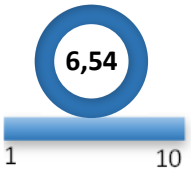
startup, founding their own or connecting to other people in order to cofound or try some entrepreneurial activity.

2. Awareness of entrepreneurial opportunities on University

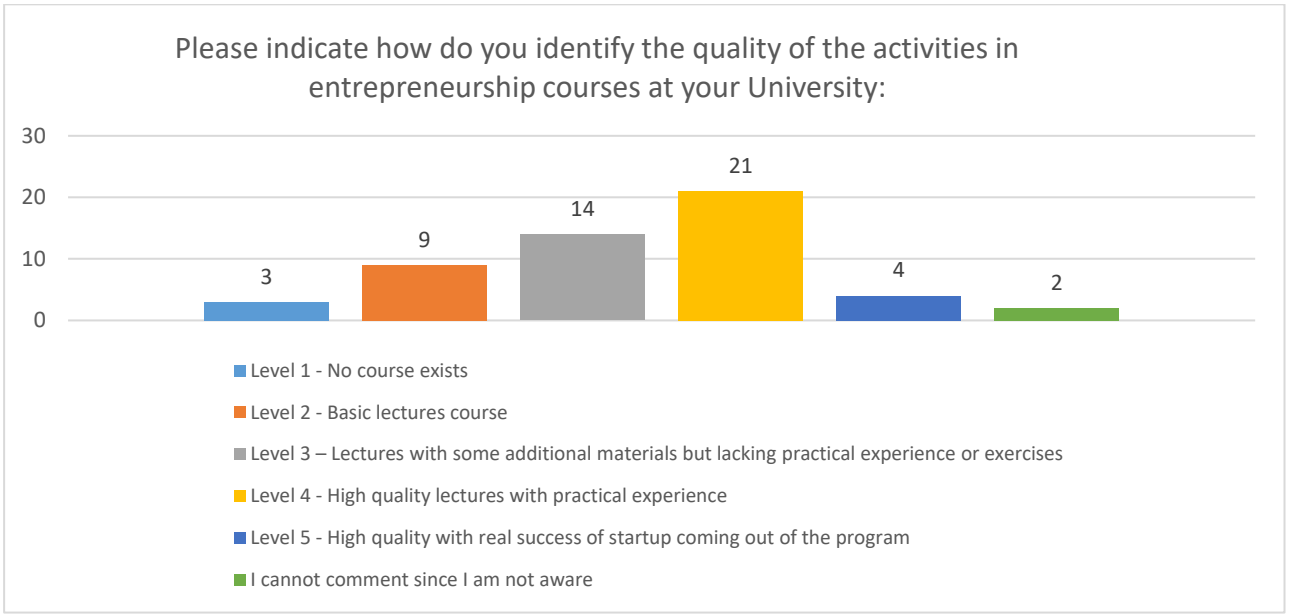
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:



Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



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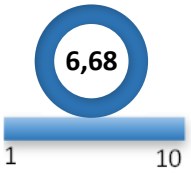
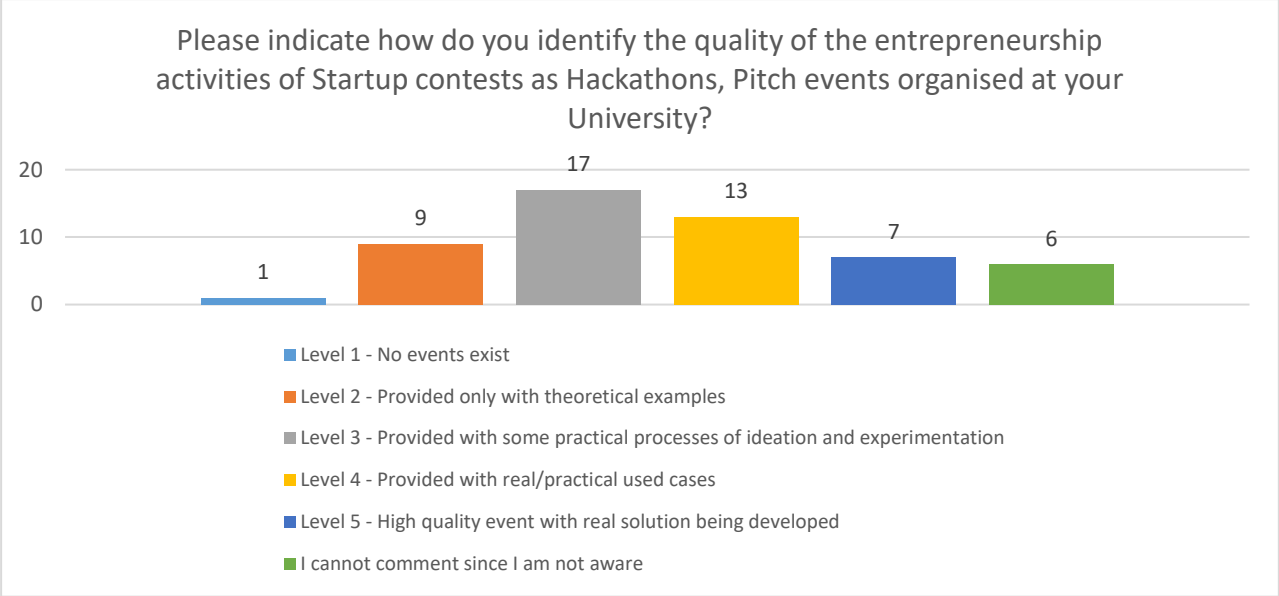
2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:

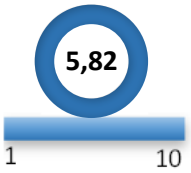


Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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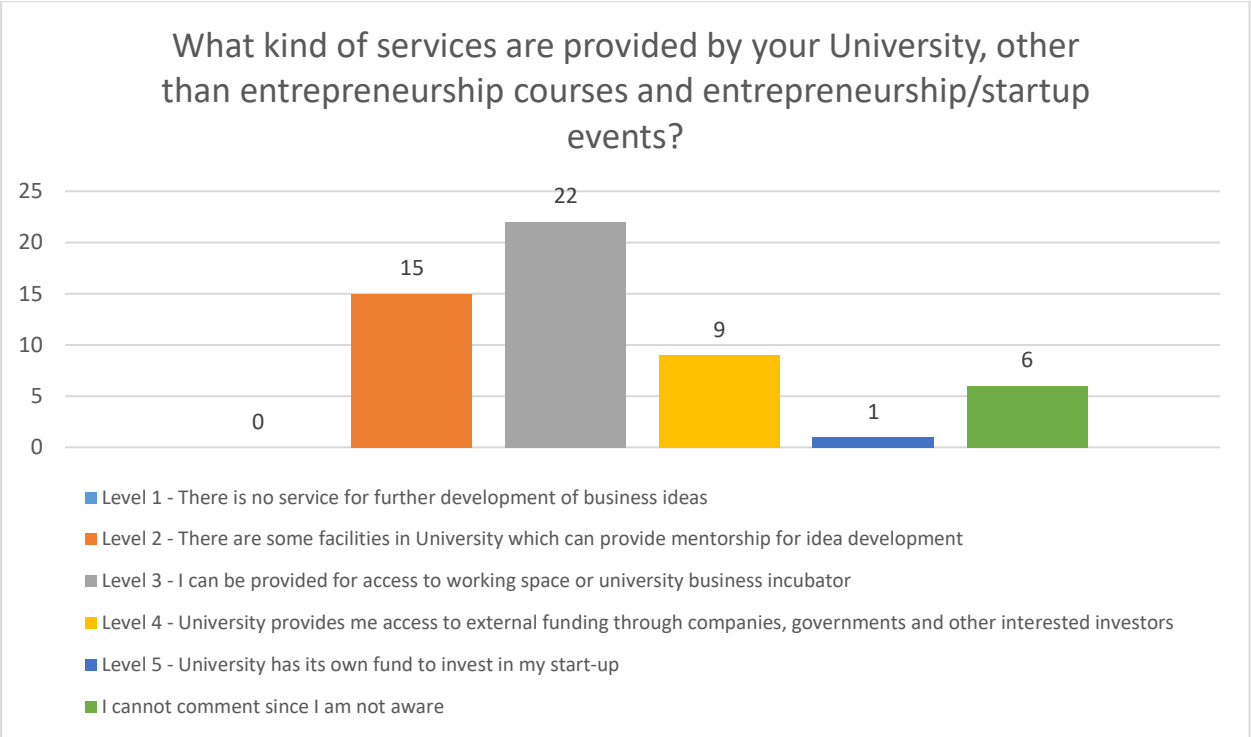
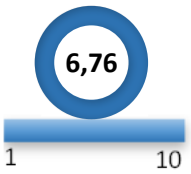


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?

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To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

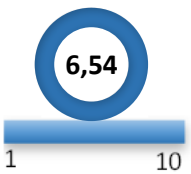
For all four questions of this output, the variable *I cannot comment since I am not aware is low*, **circling around 15% of respondent, signalizing the respondents are highly informed about entrepreneurial activates** on the campus. After taking out this variable, and looking at the rest of the results, respondent have mainly chosen levels **2, 3 and 4 (medium to high level,** different from question to question**) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities for mentorship and access to working space or incubator. Respondents have indicated that student organization have monthly organized activities.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.

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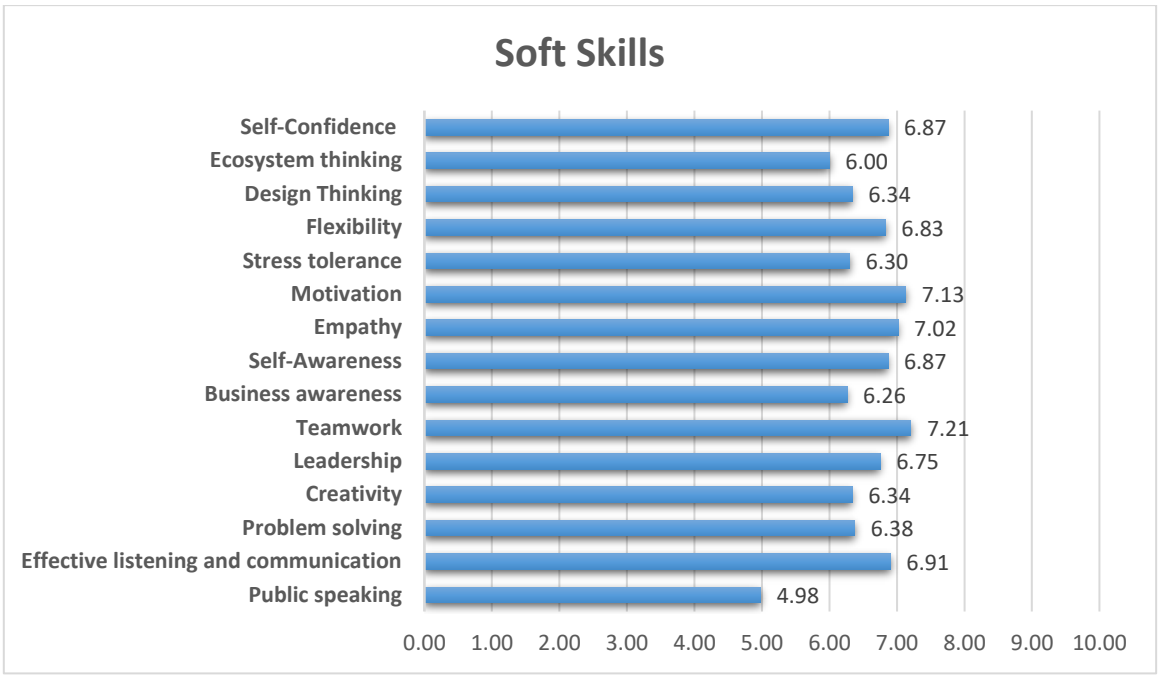
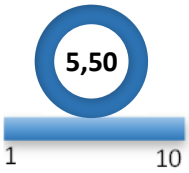


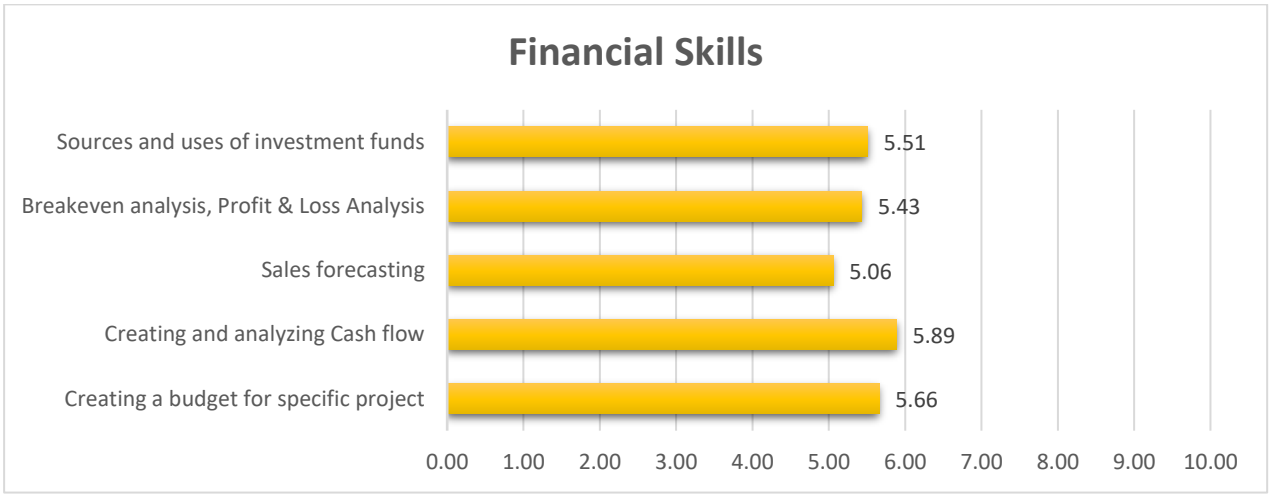
From the Soft skills side Teamwork, Motivation and Empathy have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Ecosystem thinking as the least confident ones.

3b. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.



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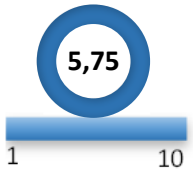
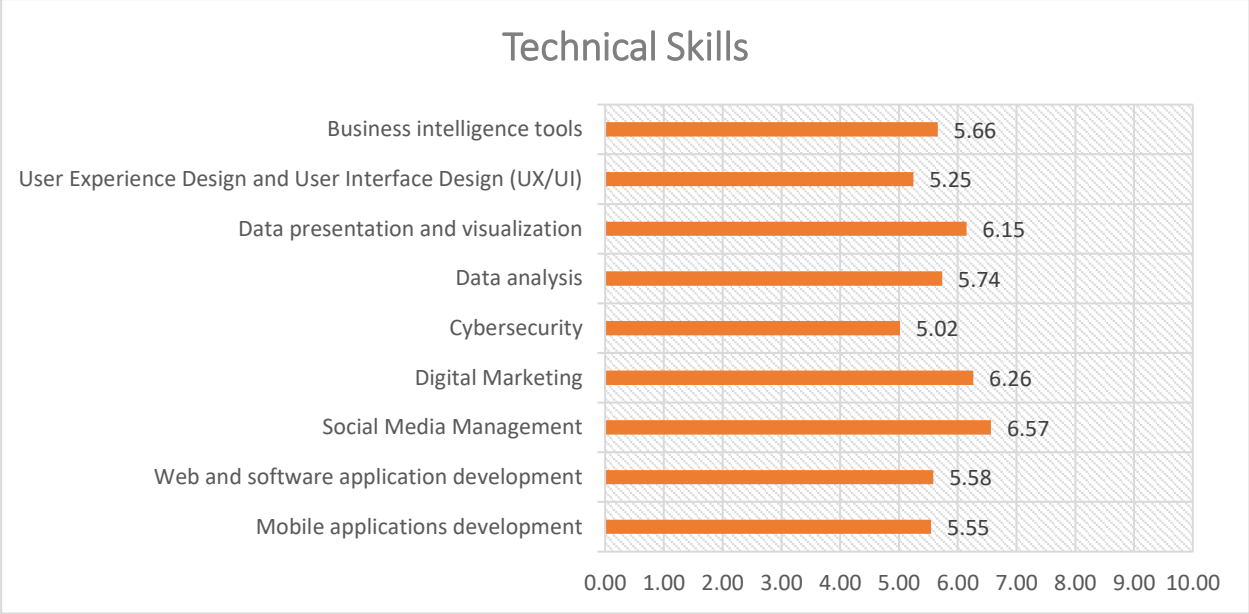
Highest overall rate selected by the respondent from the Financial skills are Creating a budget and analysing the cash flow, and lowest response rate had Sales Forecasting.

3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Social Media Management and Web and Data presentation and visualization are mostly selected as experienced skills among respondents, and Cybersecurity and User Experience Design and User Interface Design as the least experienced ones.

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4. Usage of external learning resources

The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

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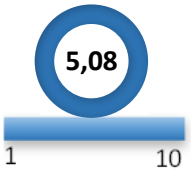
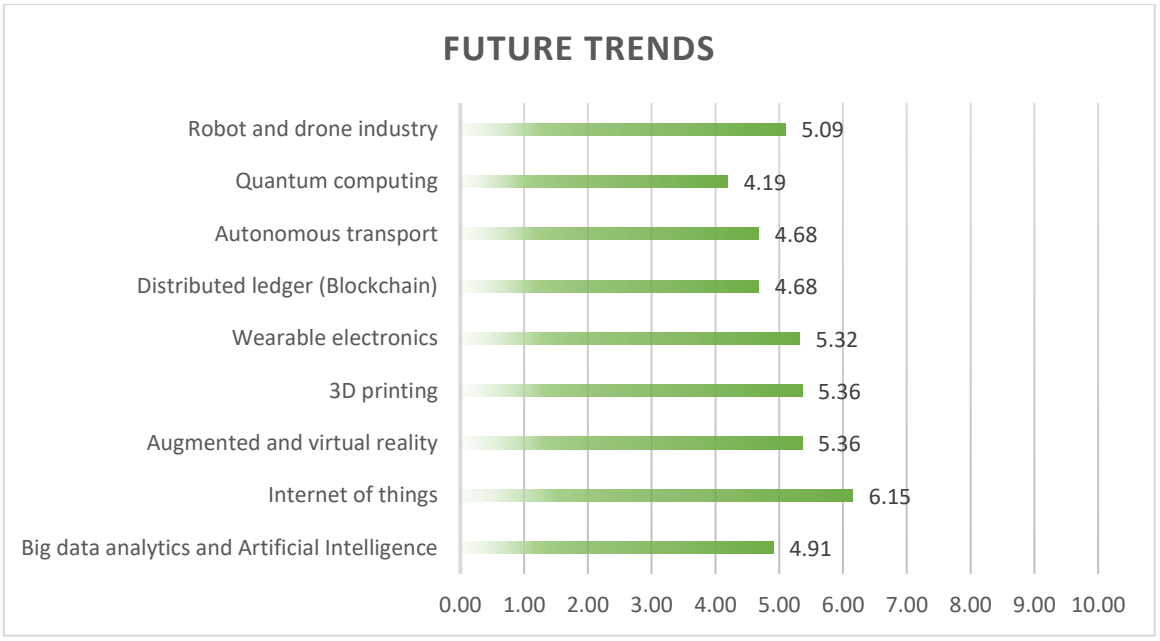
4a. Future Trends

Mean Score:



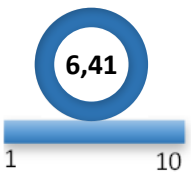
Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas and Internet of things, 3D Printing, Augmented and Virtual reality and least knowledgeable in BlockChain and Quantum Computing and Autonomous transport.

4b. Usage of web resources

Mean Score:



Q: How actively do you use web resources to gain new knowledge?

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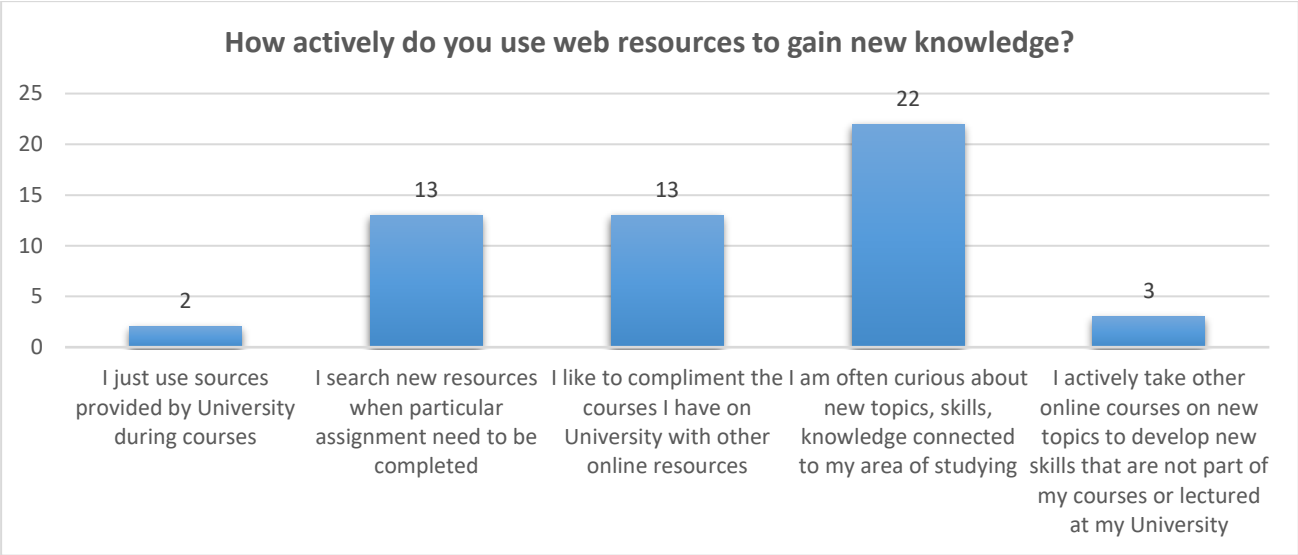
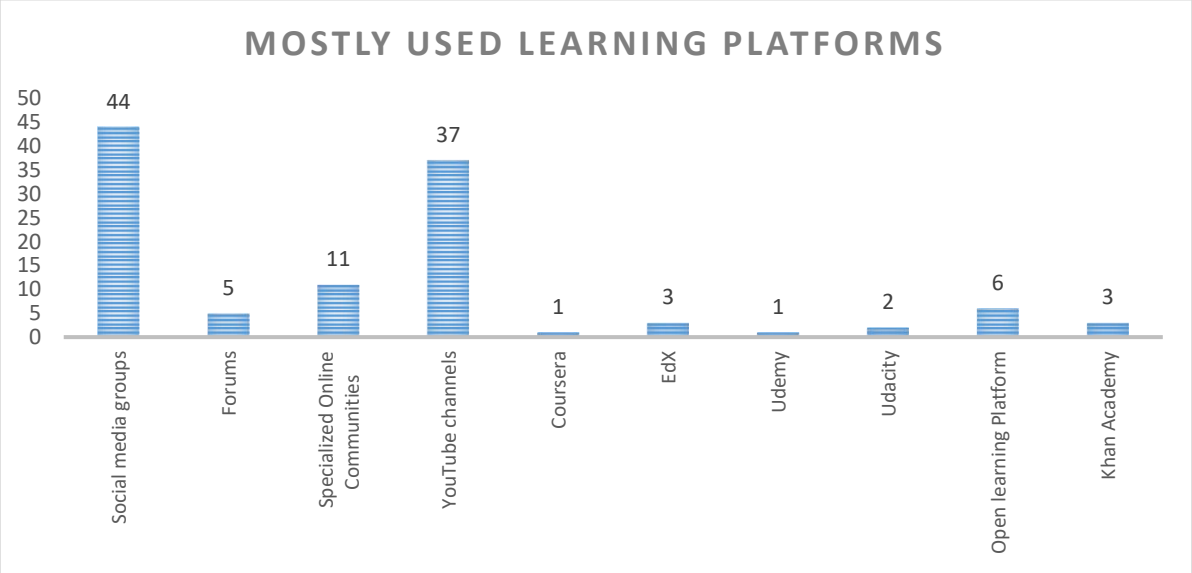


High response rate of students indicates an often curiosity and update on the knowledge connected to the study area, and as well use online courses to develop new skills and topics not connected to curriculum.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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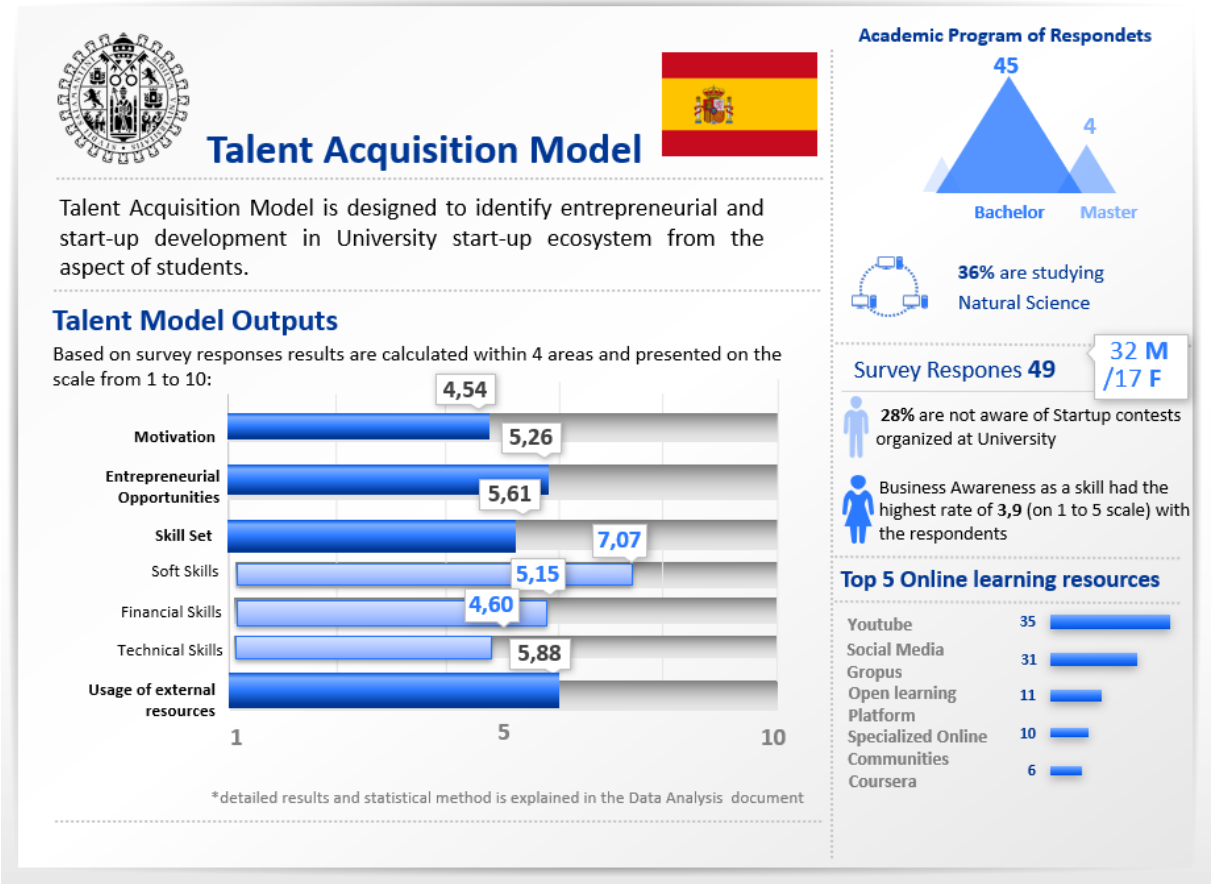
7.4. Spain

7.4.1. University of Salamanca



Talent Acquisition Model
Data Analysis of the Survey

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From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

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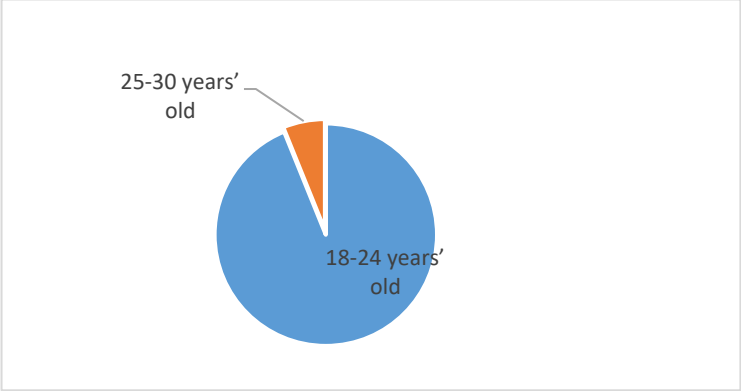
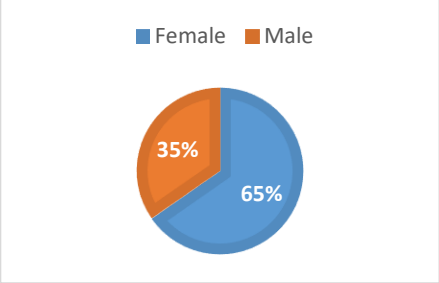
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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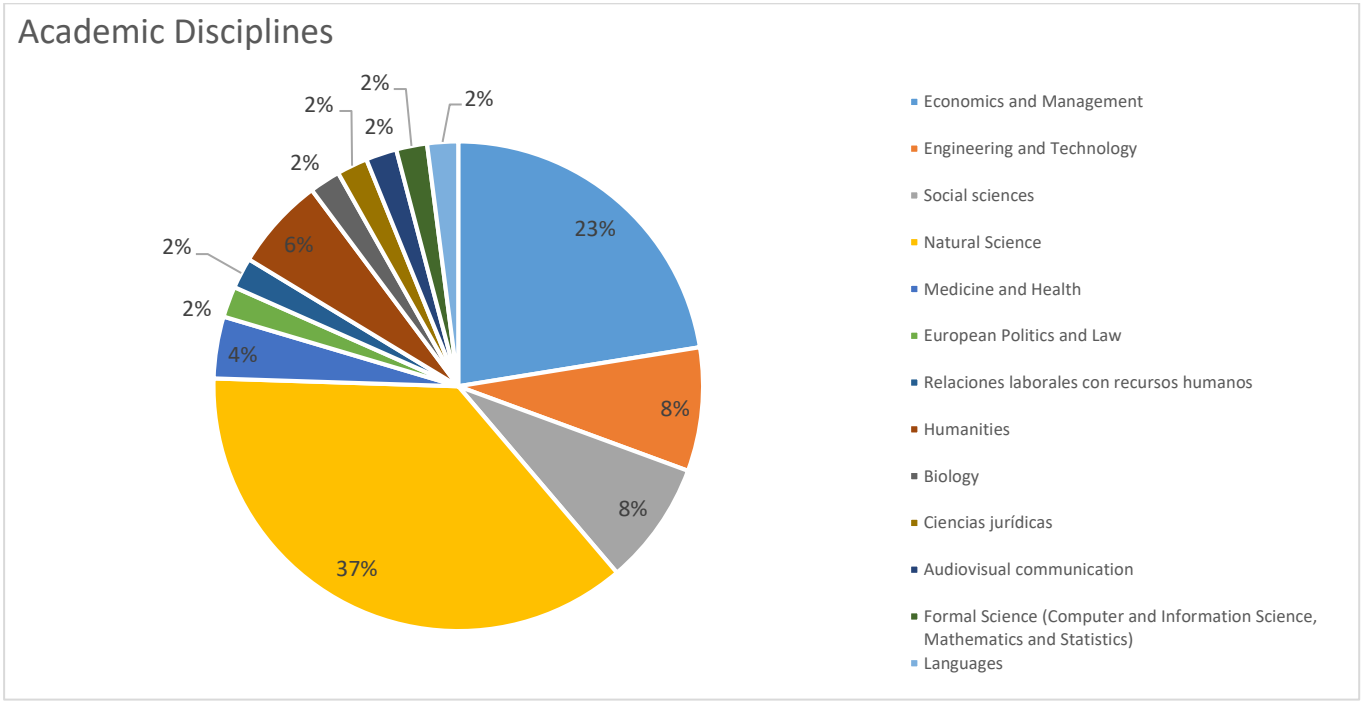
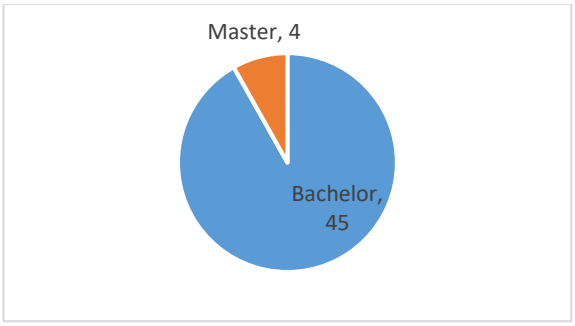
Academic disciplines:



Level of Studying:



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1. Motivation towards Entrepreneurship

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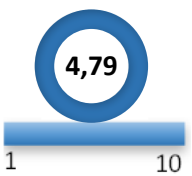
1a. Level of involvement in University entrepreneurship activities

Mean Score:



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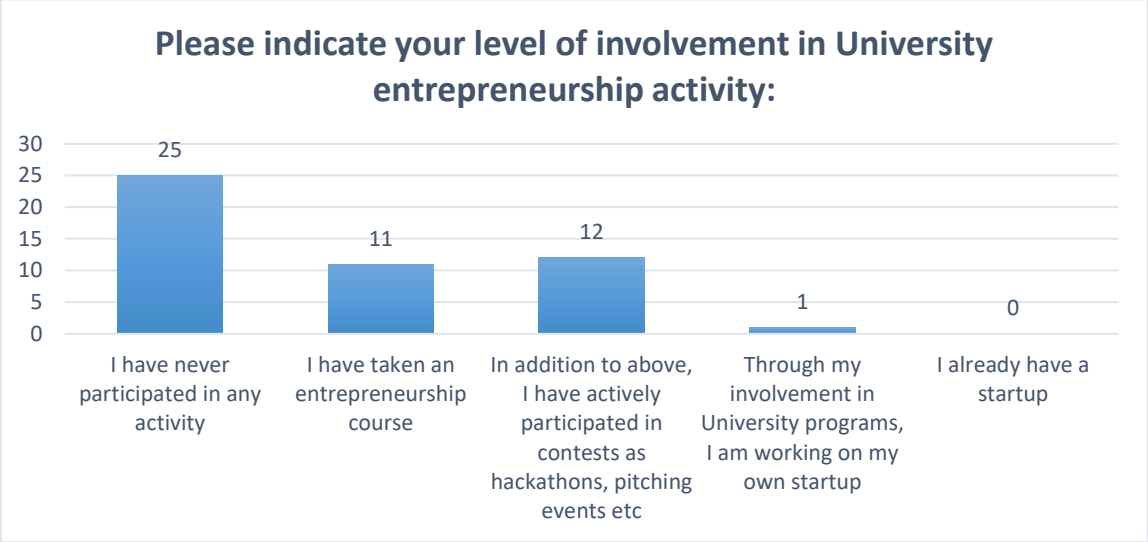
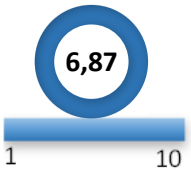
Q: Please indicate your level of involvement in University entrepreneurship activity:

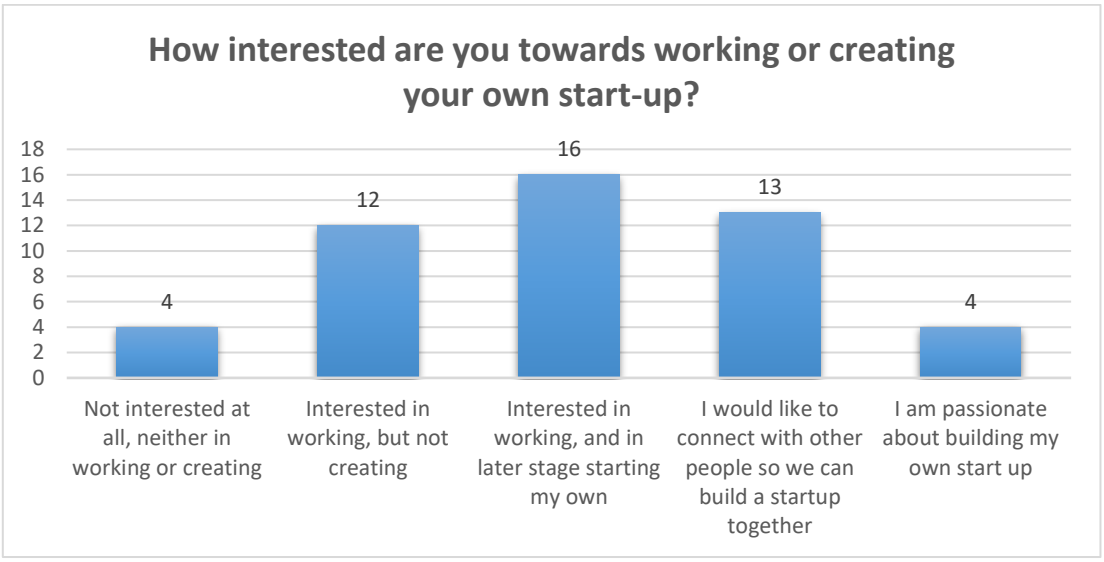


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Majority of respondents have never participated in any entrepreneurial activity so far, but on another side**, respondents have highly indicated the interest in working for a startup, founding their own** or connecting to other people in order to cofound or try some entrepreneurial activity.

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2. Awareness of entrepreneurial opportunities on University

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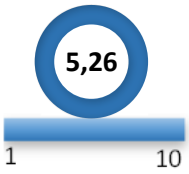
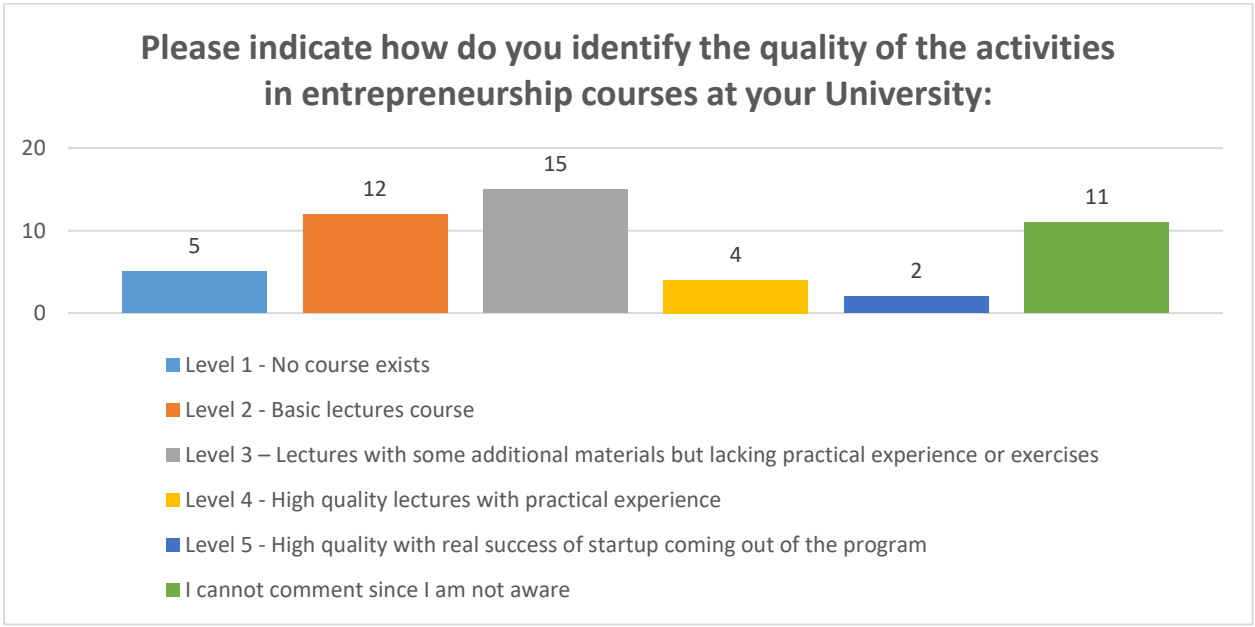
2a. Quality of the activities in entrepreneurship courses

Mean Score:

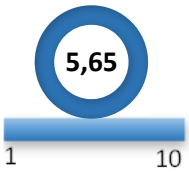


Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:



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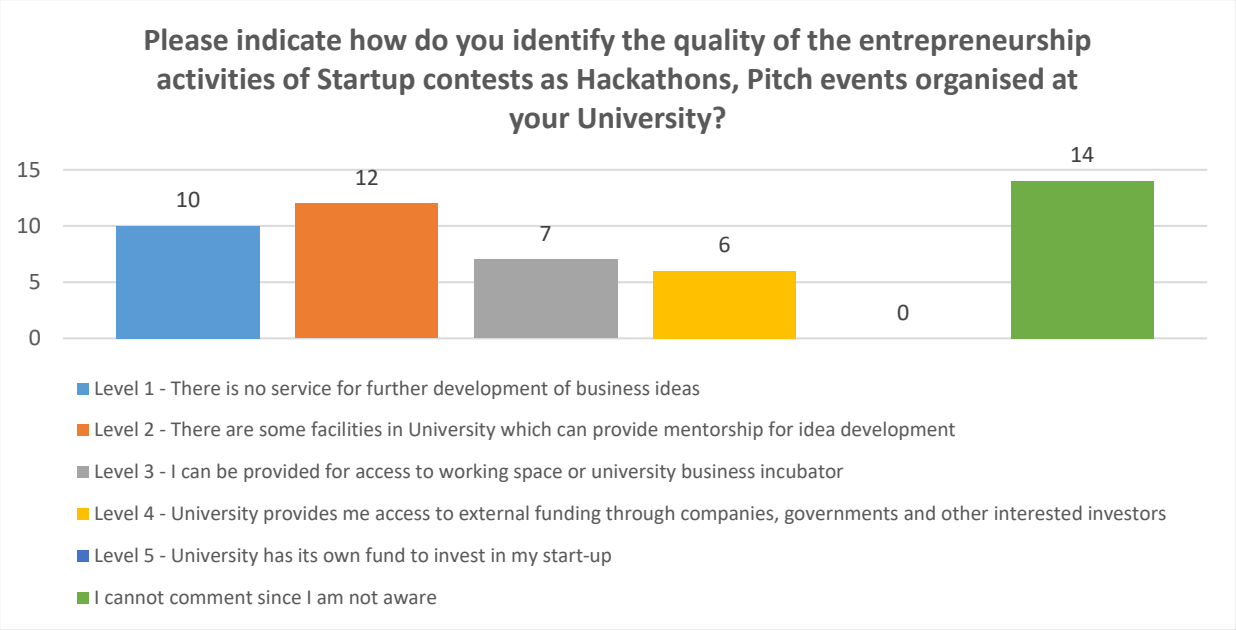
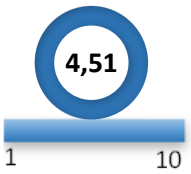
Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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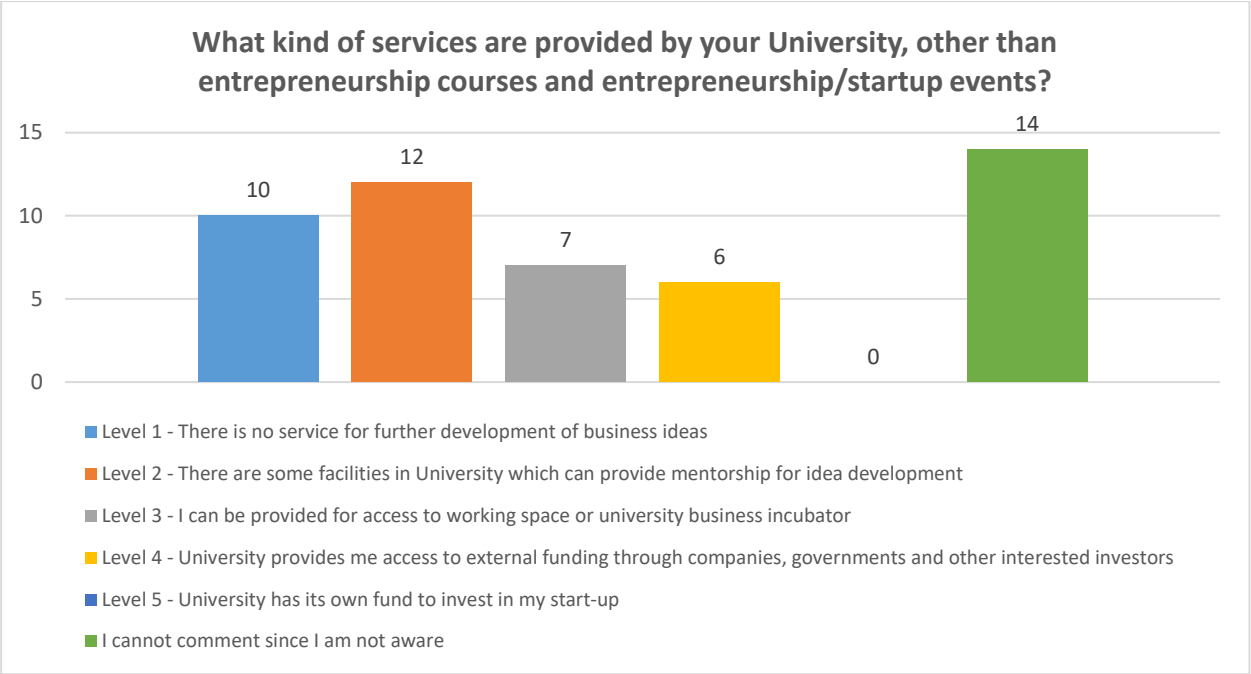
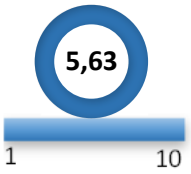
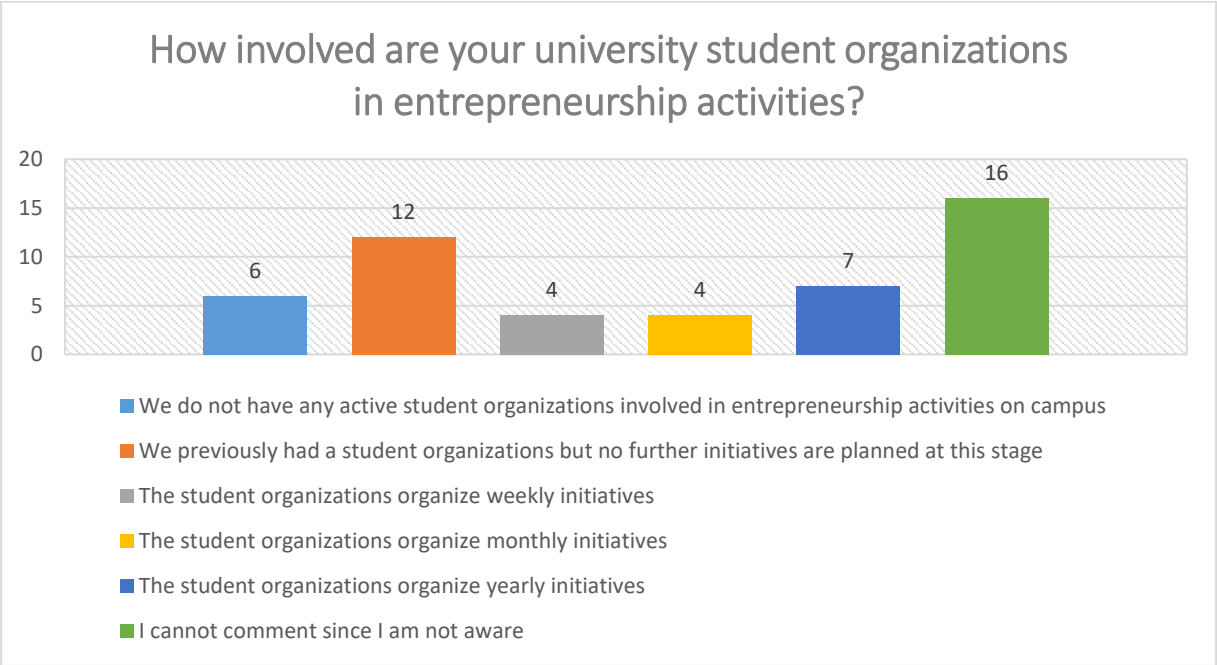


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?



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To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to take a look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

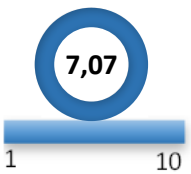
For all four questions of this output, the variable *I cannot comment since I am not aware is* around 30% **low to medium level of awareness** (different from question to question). After taking out this variable, and observing the rest of the results, respondent have mainly chosen levels 2**, 3 and 4 (medium to high level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities for mentorship and access to working space. Respondents have indicated (again with high percentage of unawareness), that student organization have been active in a pasta and some activity is done yearly.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.

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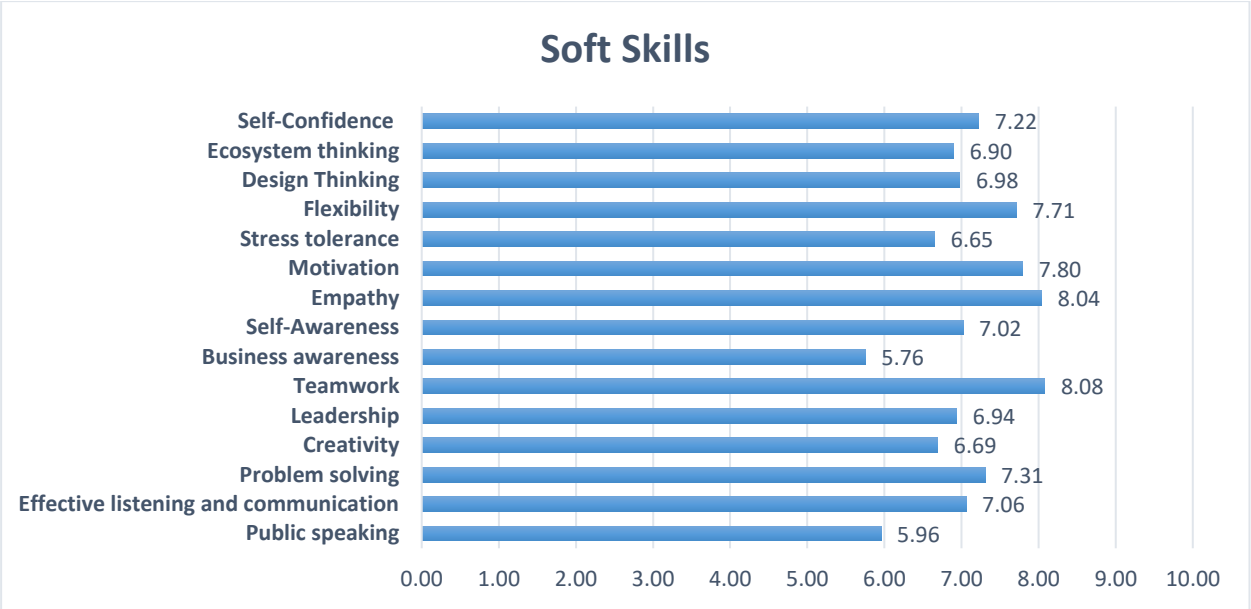
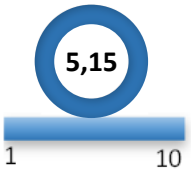


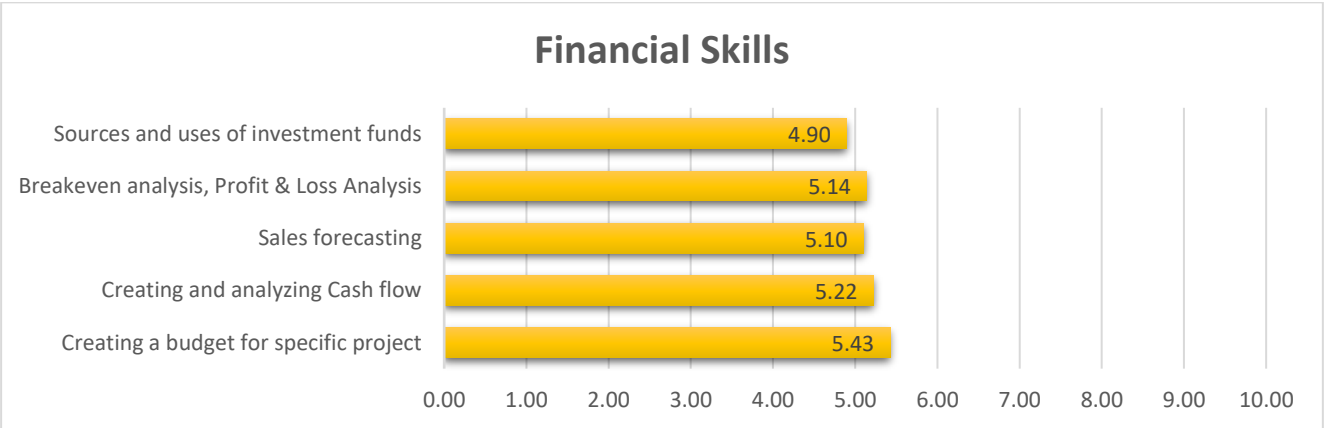
From the Soft skills side, Empathy, Teamwork and Motivation have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3b. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.



Highest overall rate selected by the respondent from the Financial skills are Creating a budget and analysing the cash flow, and lowest response rate had Sales Forecasting.

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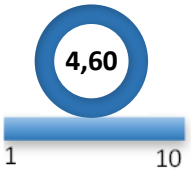
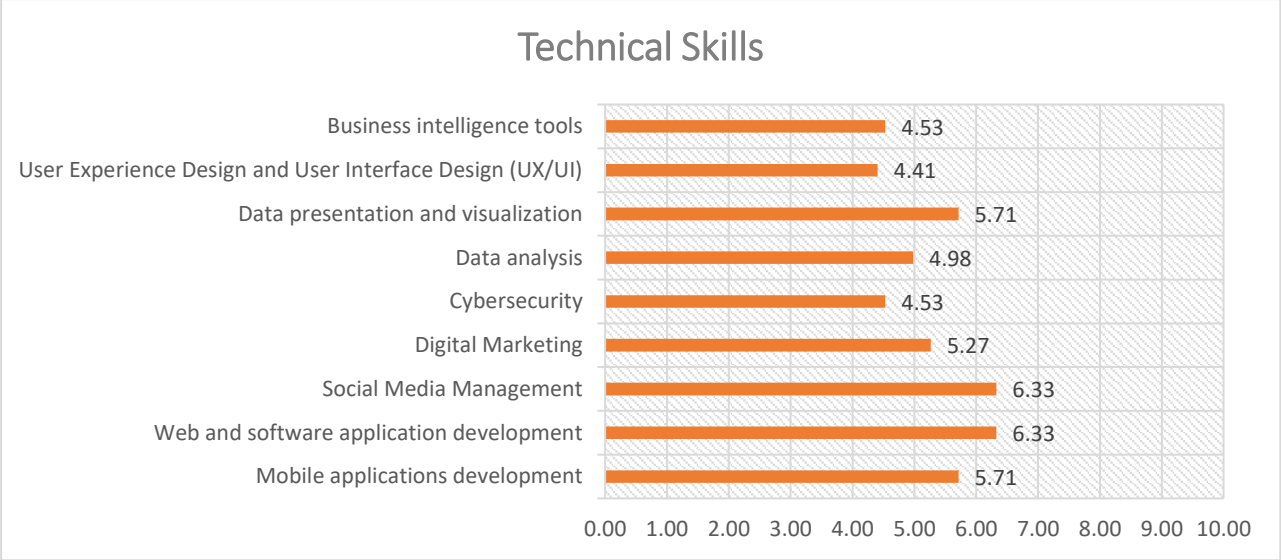
3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Highest overall rates selected by the respondent from the technical skills are Social Media Management and Web and software applications development, and Cybersecurity and User Experience Design and User Interface Design as the lowest rated in awareness and experience by the respondents.

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4. Usage of external learning resources

The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

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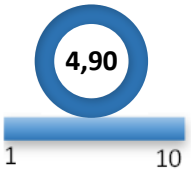
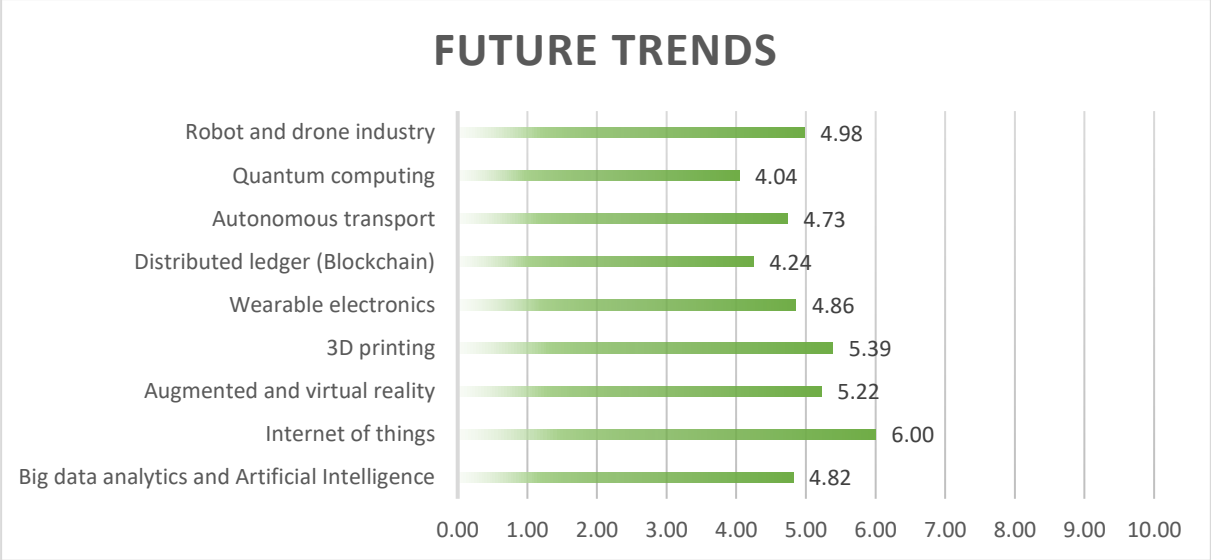
4a. Future Trends

Mean Score:



Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.

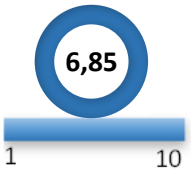


Respondents are mostly experienced or practiced new technologies and trends in the areas and Internet of things, 3D Printing and least knowledgeable in BlockChain and Quantum Computing.

4b. Usage of web resources

Q: How actively do you use web resources to gain new knowledge?

Mean Score:



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European Commission
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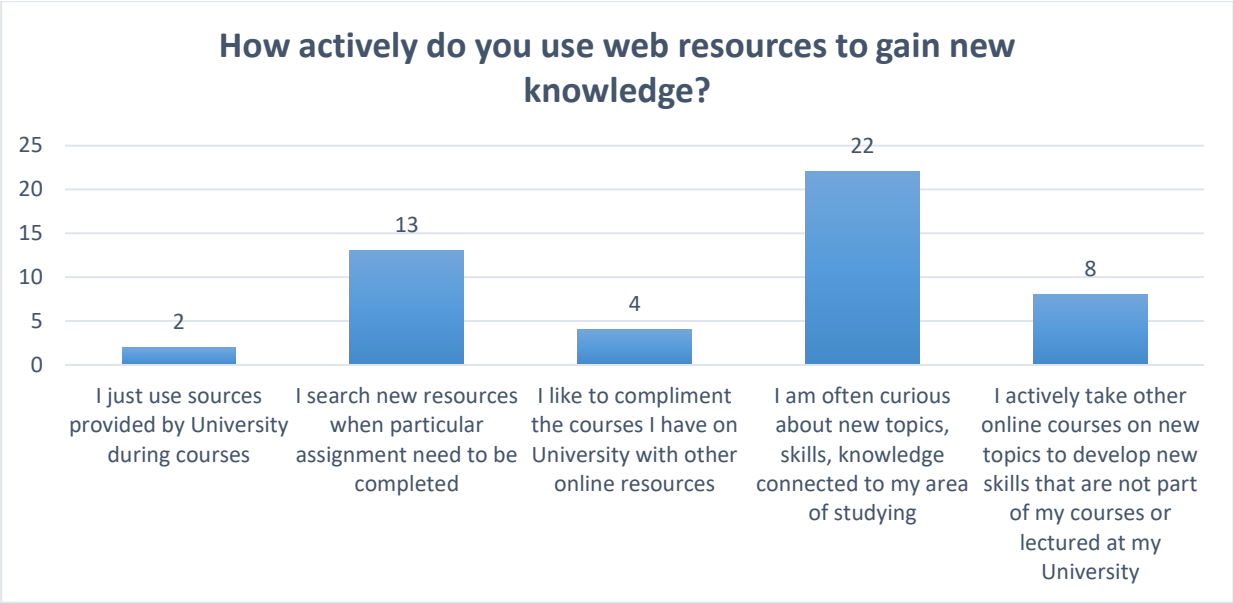
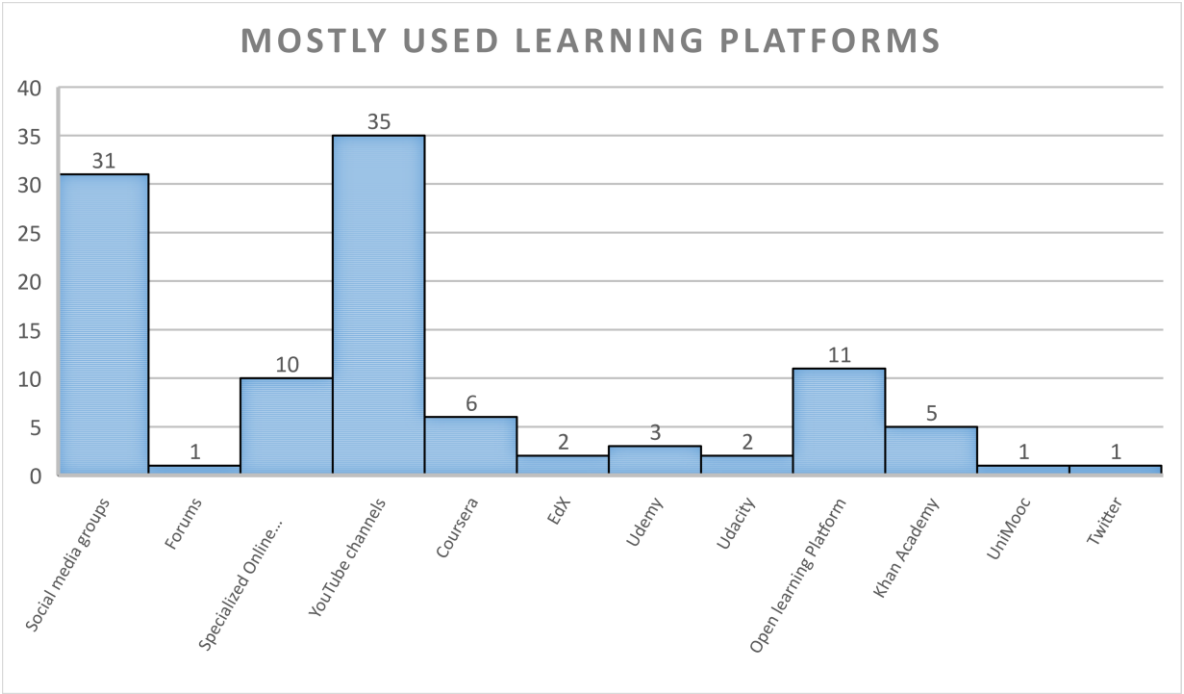


High response rate of students indicates an often curiosity and update on the knowledge connected to the study area, and as well use online courses to develop new skills and topics not connected to curriculum.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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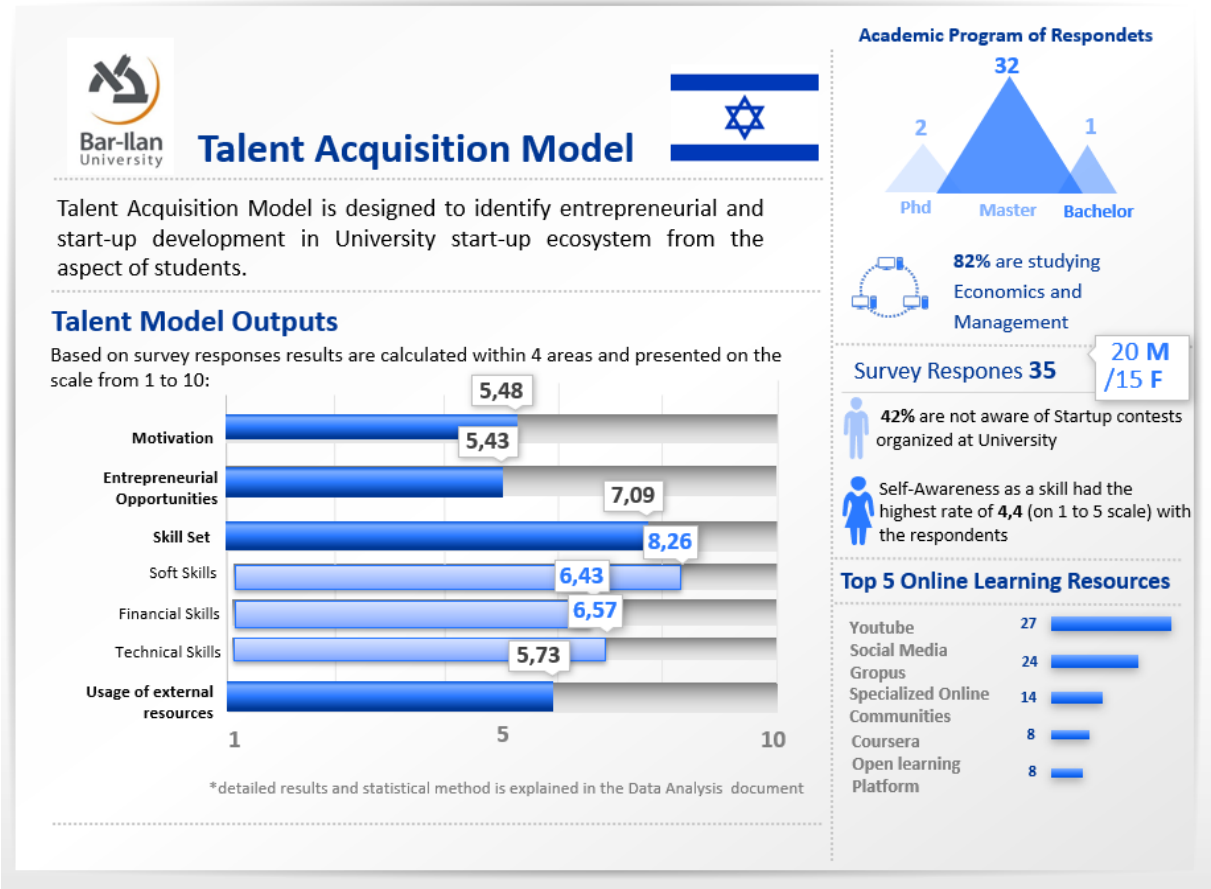
7.5. Israel

7.5.1. University of Bar-Ilan



Talent Acquisition Model

Data Analysis of the Survey

Bar-Ilan University

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

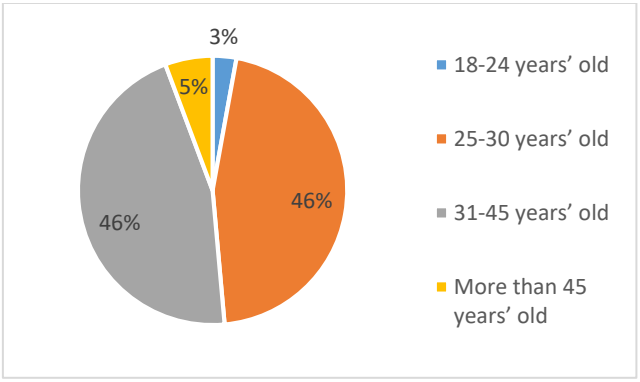
From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

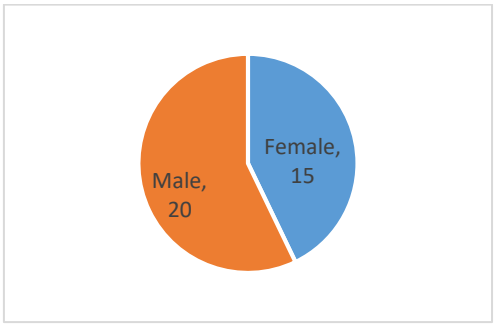
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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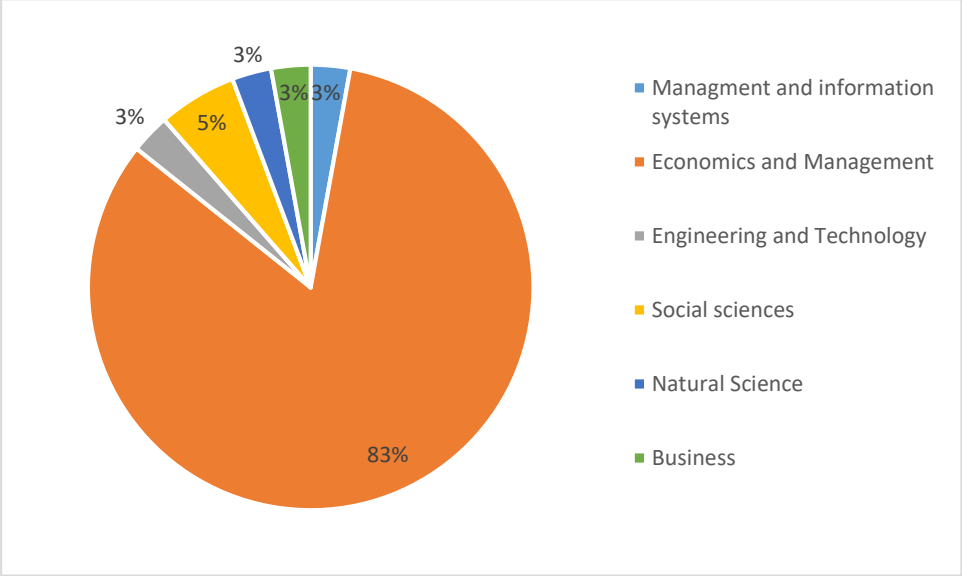
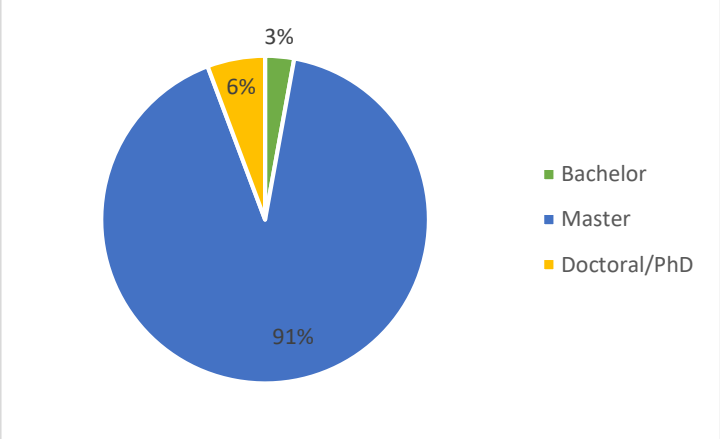
Academic disciplines:



Level of Studying:



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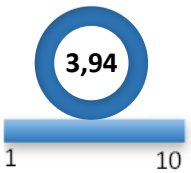
1. **Motivation towards Entrepreneurship**

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



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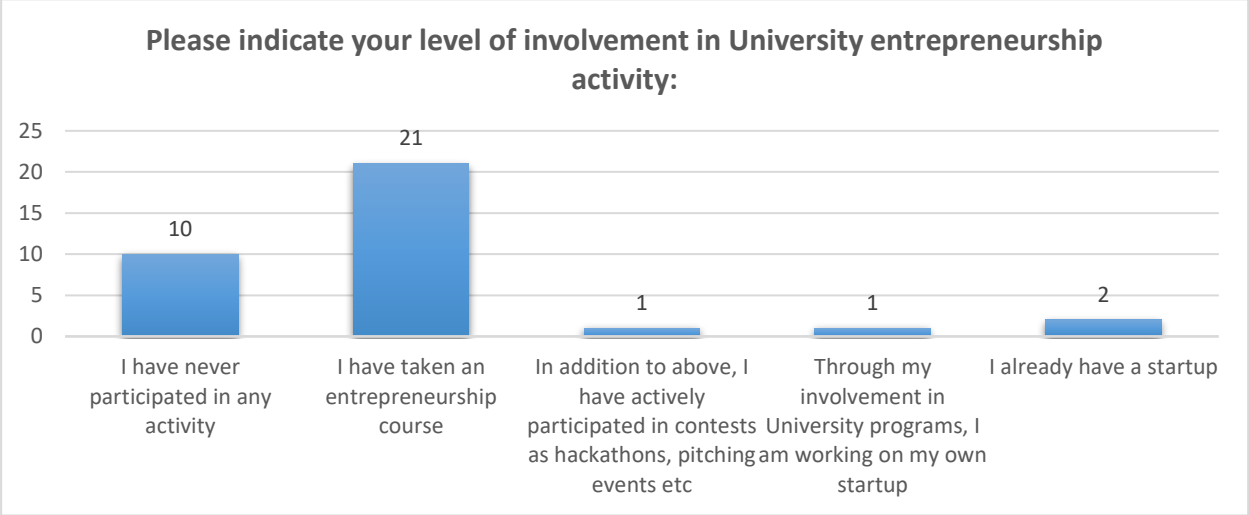
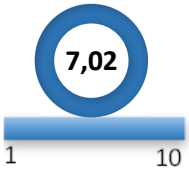
Q: Please indicate your level of involvement in University entrepreneurship activity:

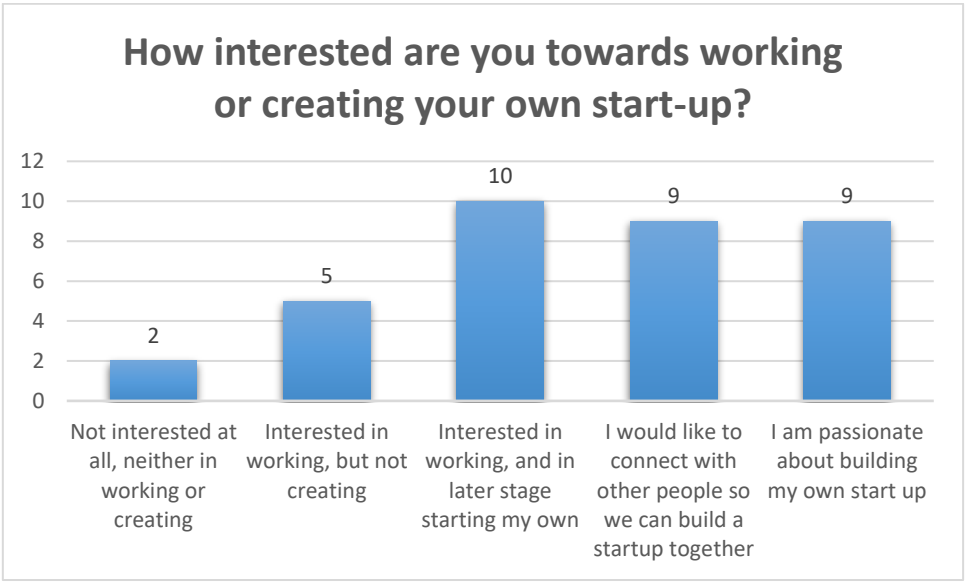


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



High response rate is highlighting the two responses of never participating in any activity and just having an entrepreneurship course. But on another side, **respondents have highly indicated** the interest in working for a startup, founding their own or connecting to other people in order to cofound or try some entrepreneurial activity.

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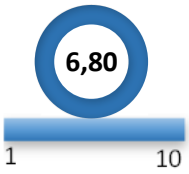
2. Awareness of entrepreneurial opportunities on University

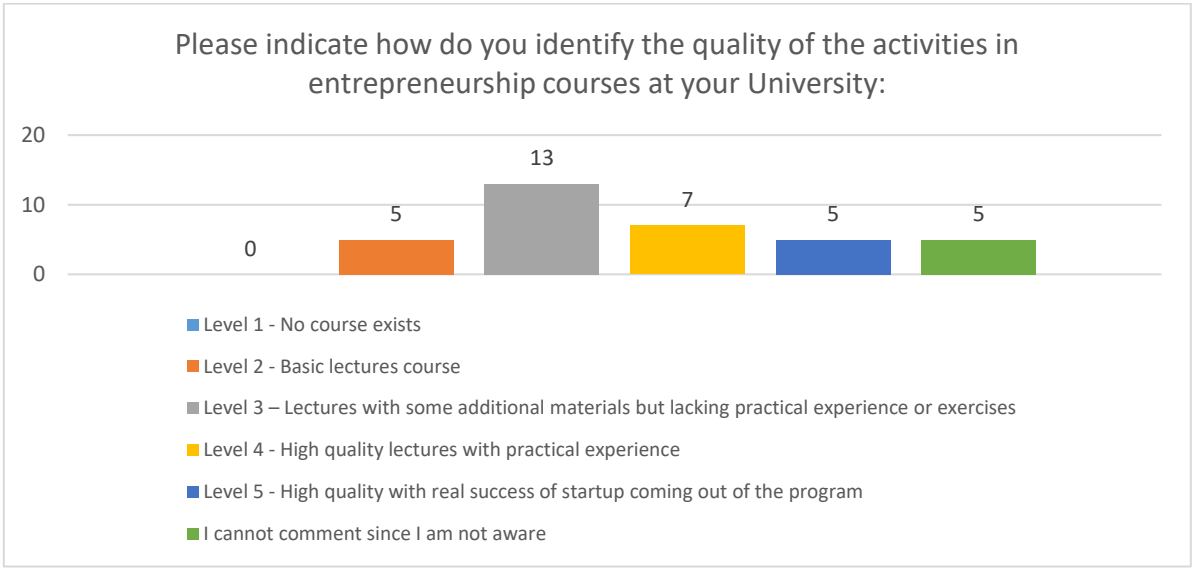
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:

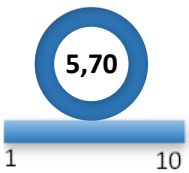


Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:



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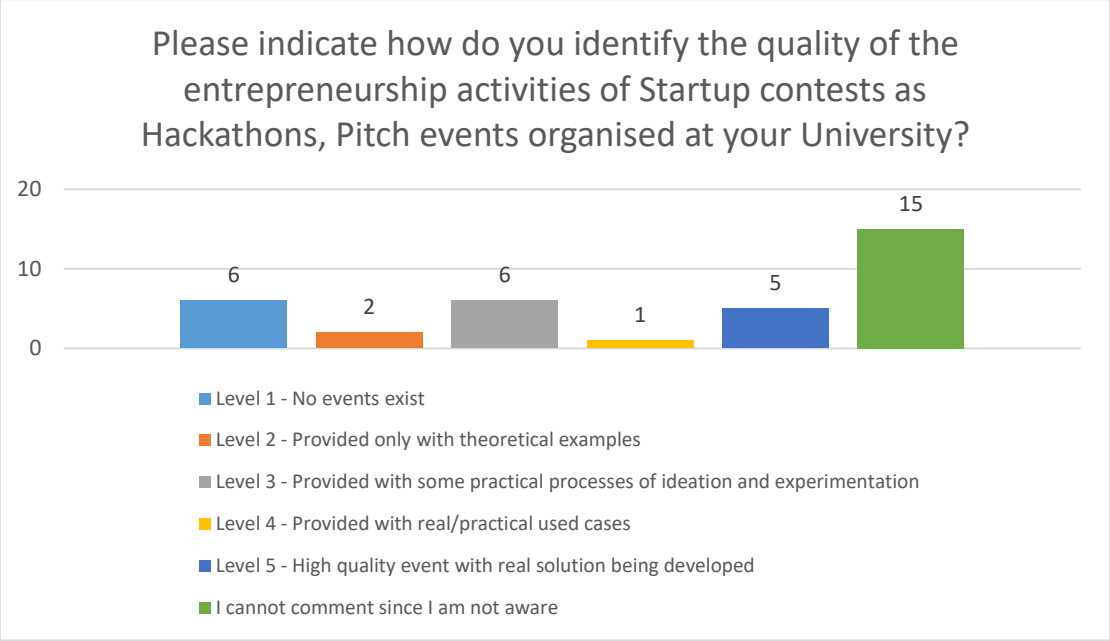
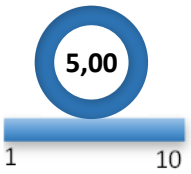
Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



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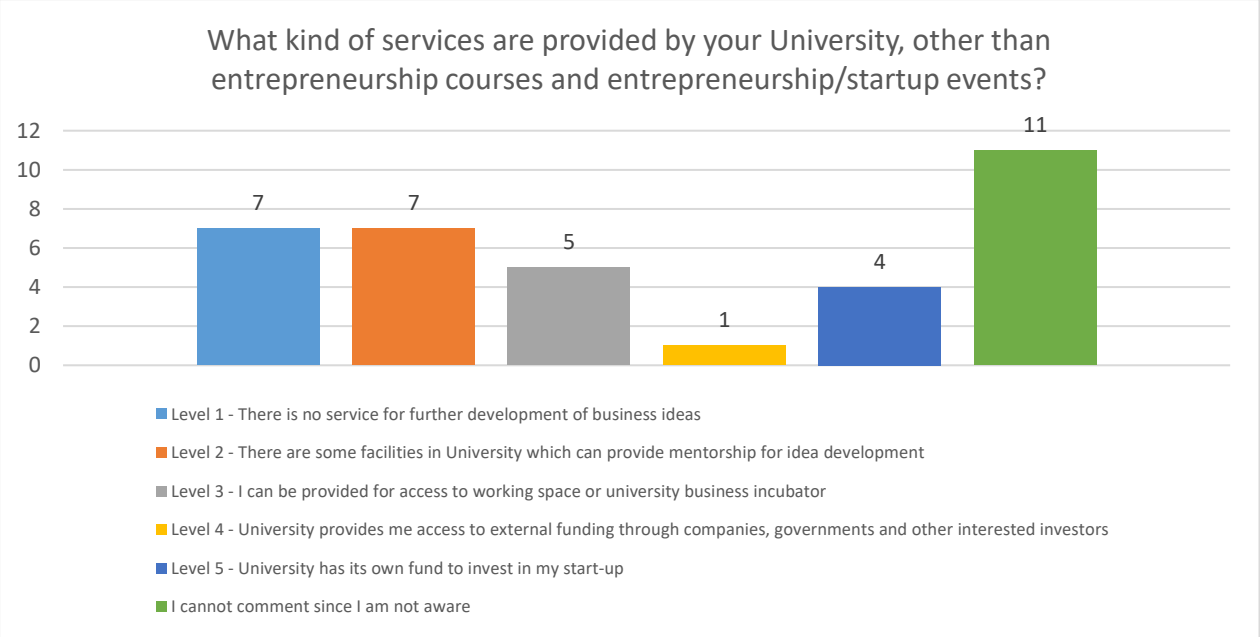
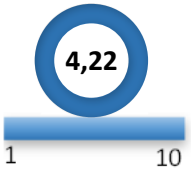
Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

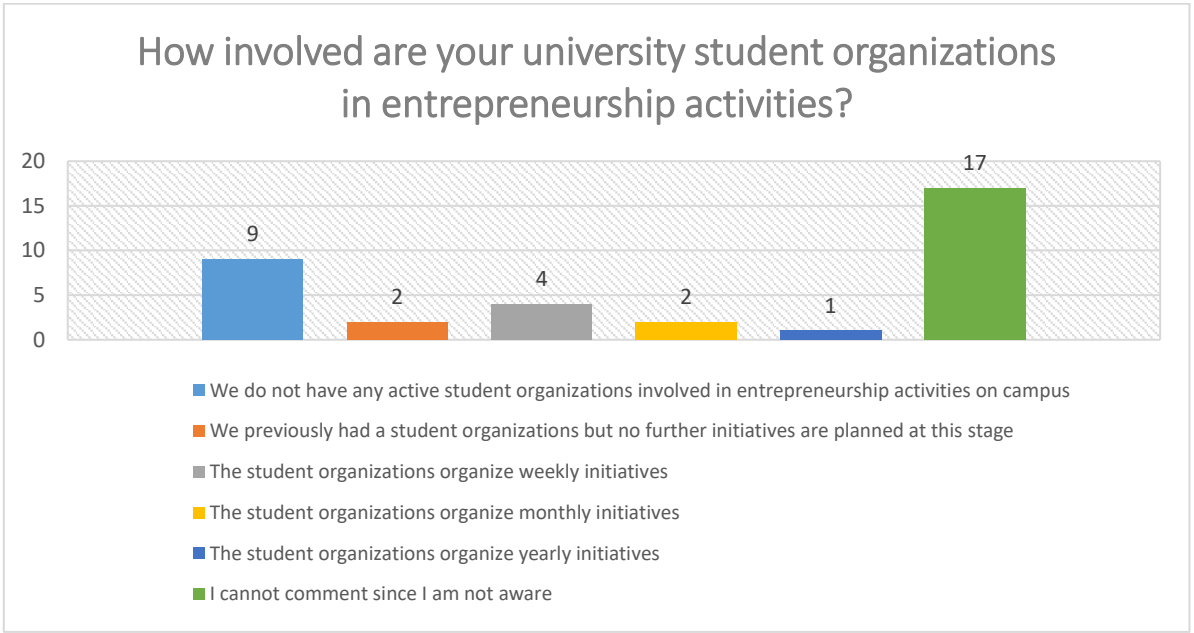


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?



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To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

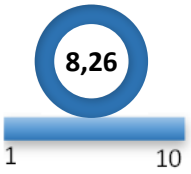
For all four questions of this output, the variable *I cannot comment since I am not aware* is **medium-low, around** 30% of respondent, signalizing the respondents did not have any connected activities or their level of unawareness. After taking out this variable, and observing the rest of the results, respondent have mainly **chosen levels 2, 3 and 4 (medium level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of facilities which can provide mentorship support and access to working space and business incubators. Respondents have indicated (again with high percentage of unawareness), that there is no student organization involved with entrepreneurship activities with high response rate.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



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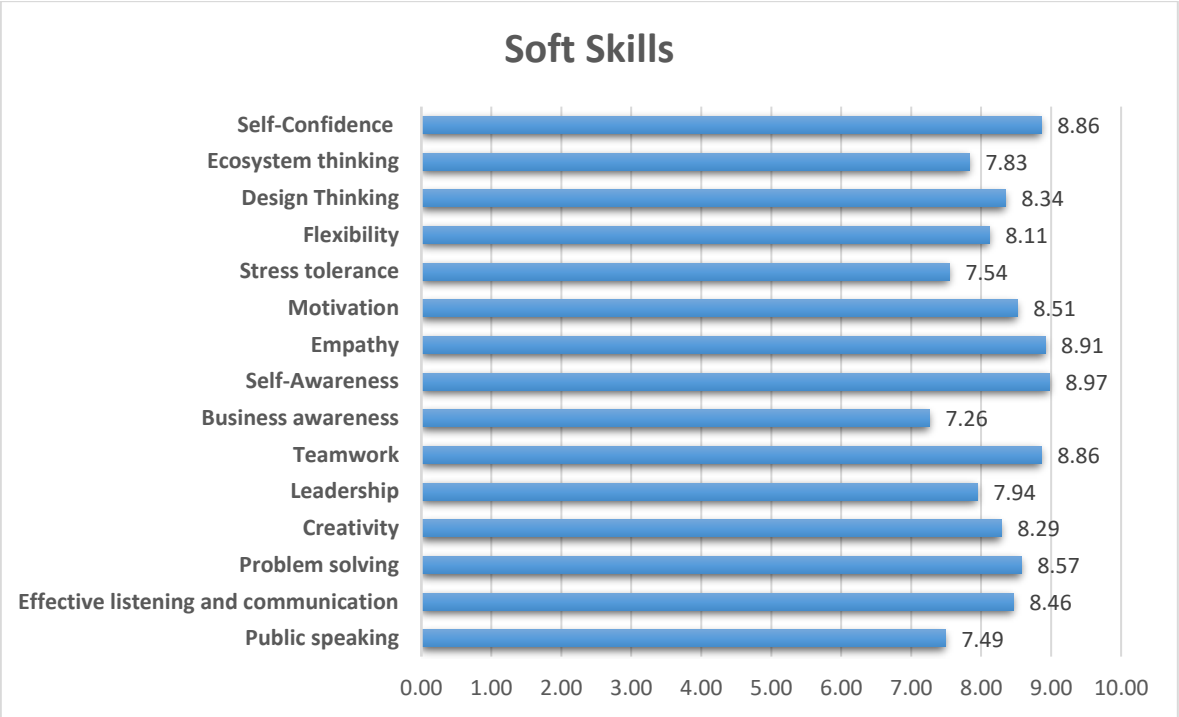
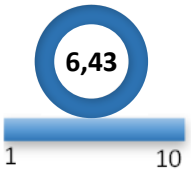
Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.



Self-Awareness, Teamwork and Empathy have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3b. Financial skills

Mean Score:



Q. Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.

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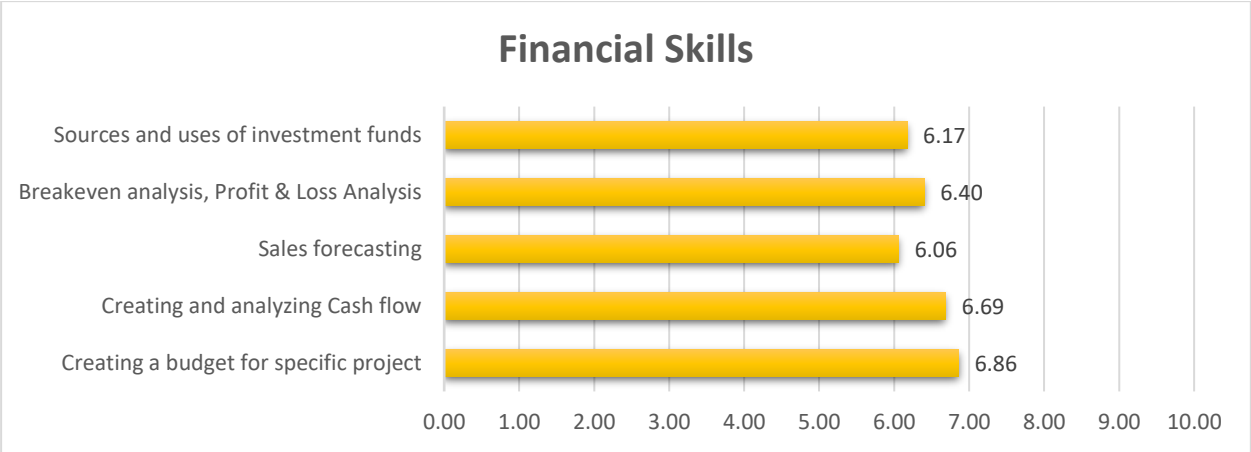
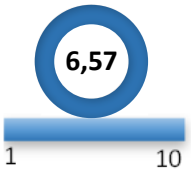


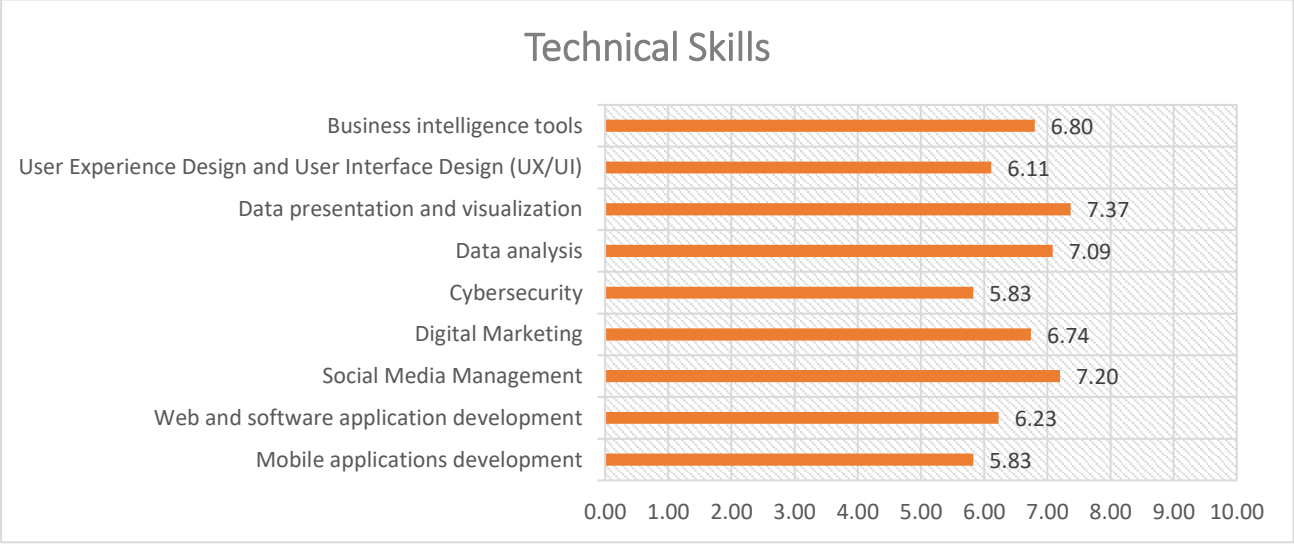
Highest overall rate selected by the respondent from the Financial skills are Creating a budget and analysing the cash flow, and lowest response rate had Sales Forecasting.

3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Highest overall rate selected by the respondent from the Technical skills are Social Media Management and Web and Data presentation and visualization are mostly selected as experienced skills among respondents, and Cybersecurity and Mobile application development as the lowest rated in awareness and experience by the respondents.

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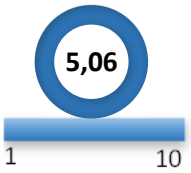
4. Usage of external learning resources

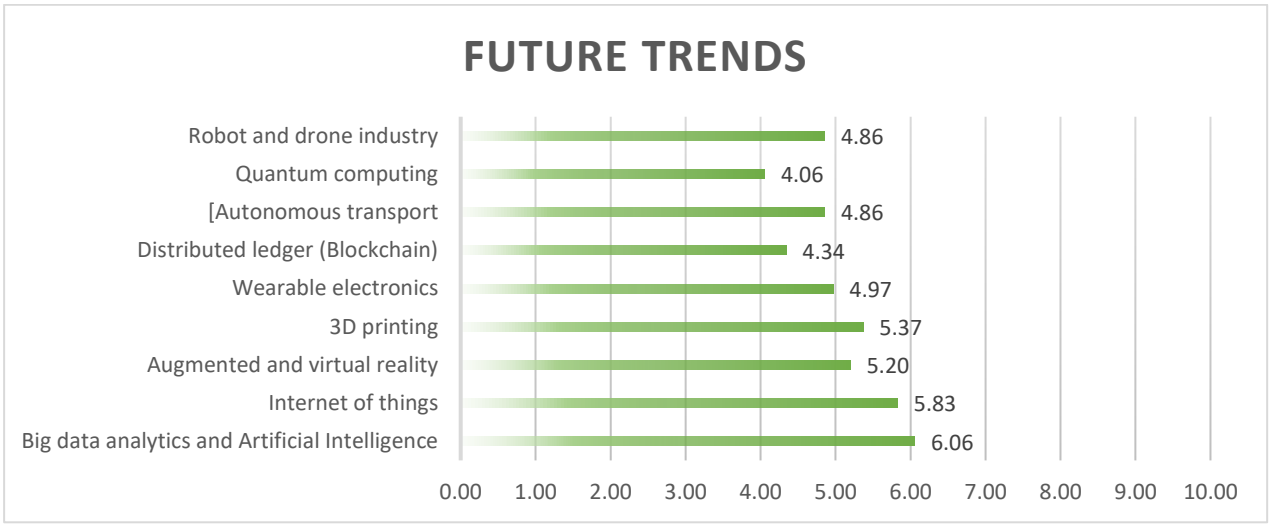
The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

4a. Future Trends

Mean Score:



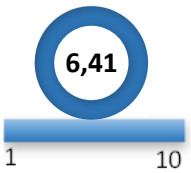
Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas and Big data and AI, Internet of things and Augmented and Virtual reality, and least knowledgeable in Blockchain and Quantum Computing and Autonomous transport.

4b. Usage of web resources

Mean Score:



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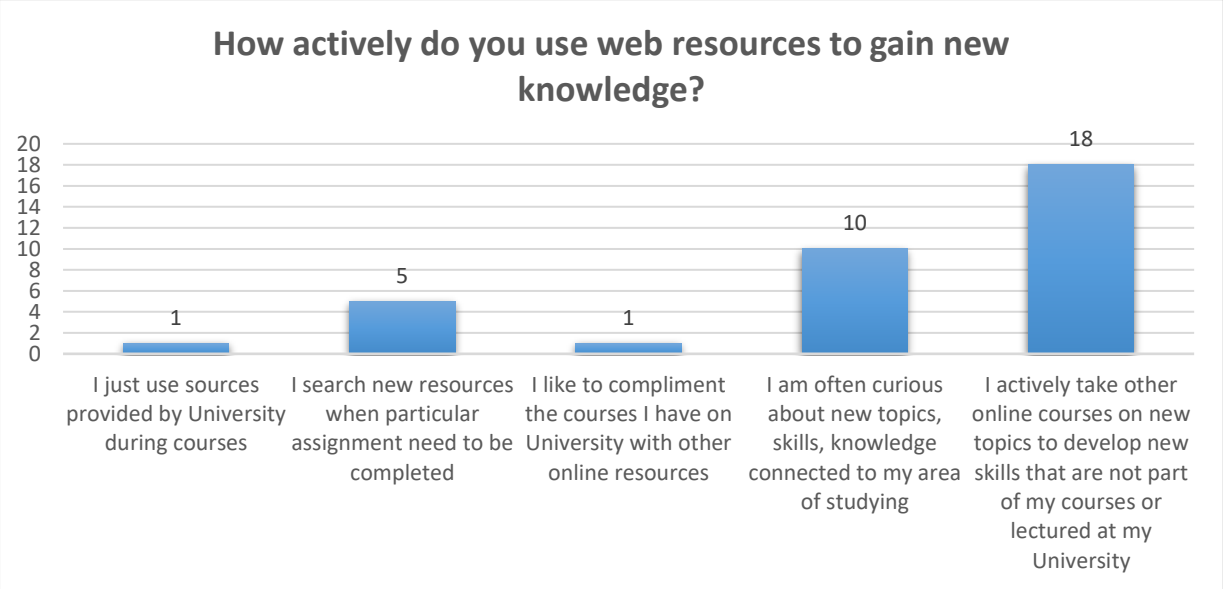
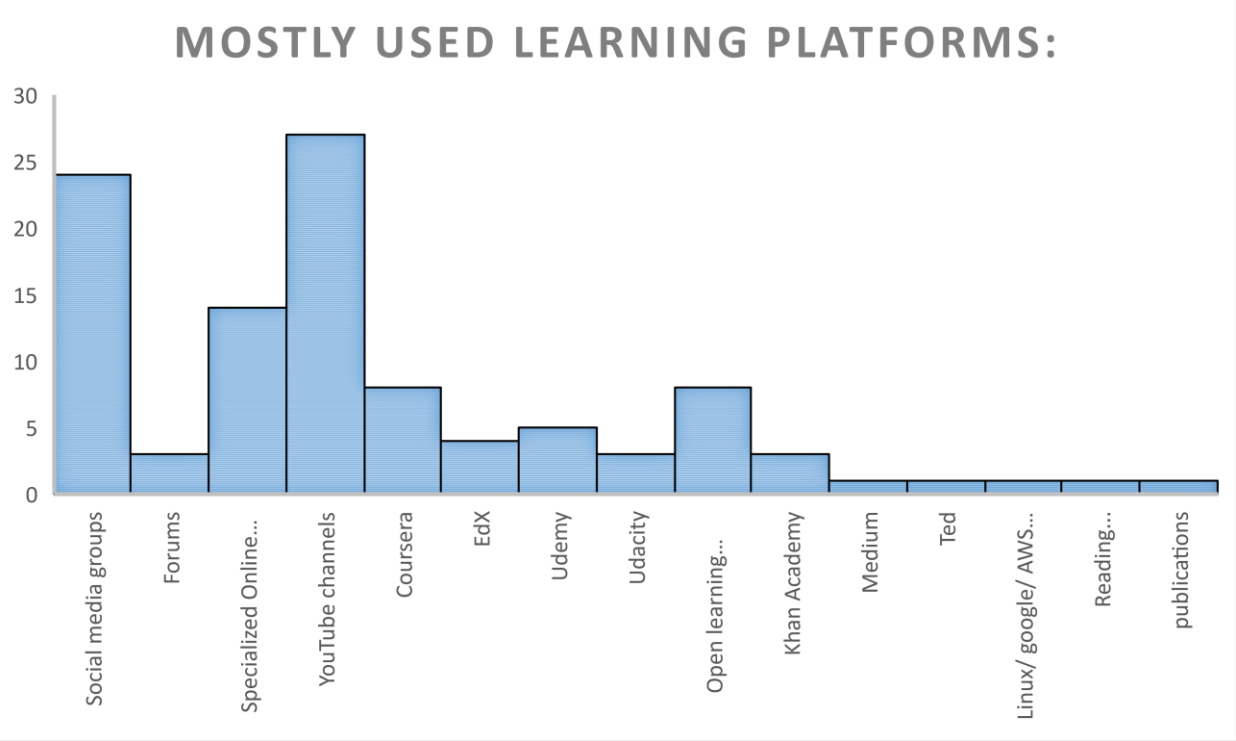
Q: How actively do you use web resources to gain new knowledge?



High response rate of students indicates use of online courses to develop new skills and topics not connected to curriculum and an often curiosity and update on the knowledge connected to the study area.

Q: What kind of online learning platforms do you use to gain new knowledge:



Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

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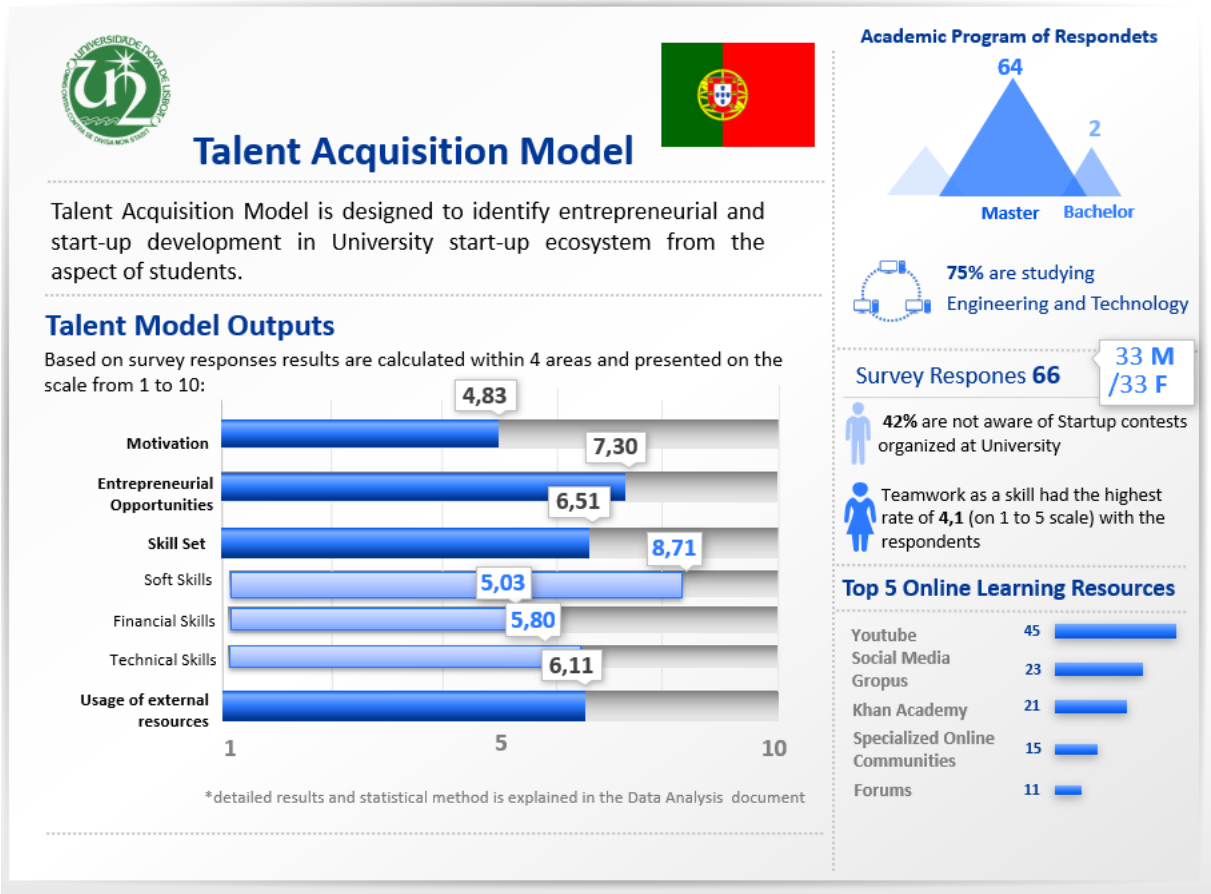
7.6. Portugal

7.6.1. University Nova Lisbon



Talent Acquisition Model
Data Analysis of the Survey

Talent model was designed to identify the selected points of entrepreneurial and start-up ecosystem at the University from the perspective of students. Selected points include, individual motivation for startups, awareness of entrepreneurial opportunities (including different startup opportunities on University and entrepreneurial courses), skills set (soft, technical and financial), future trends and usage of external online learning platforms.

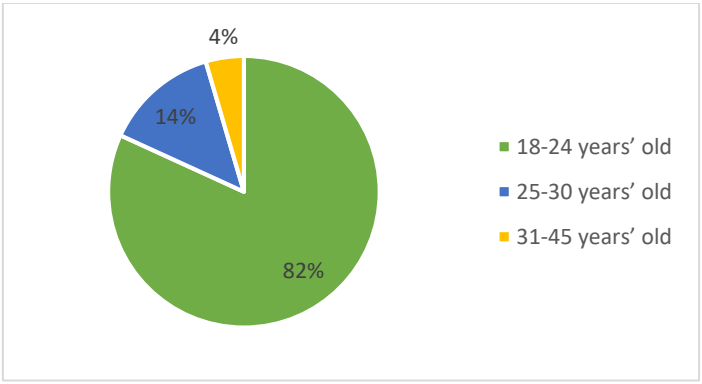
From 17 questions of the Survey, 4 outputs were created, summing some questions into one output (for example, awareness of entrepreneurial opportunities is compiled with 4 questions). In front of each output of the question, overall summed scored for the output is presented, followed by detailed results for every question. Questions are presented within 5 level answers, 10-point scale or number of responses per answer.

The data was analysed in order to get summed averages weighted on the scale from 1 to 5, as a Mean Score. The Mean or Average score of a certain set of data is equal to the sum of all the values in the data set divided by the total number of values. In the following document, for each question a Mean score was calculated and presented. The questions were created to give a clear distinguish of every answer (from 5 being the best option and 1 being the least favourable option), so the data could be analysed by taking the weighed averaged sum of each question.

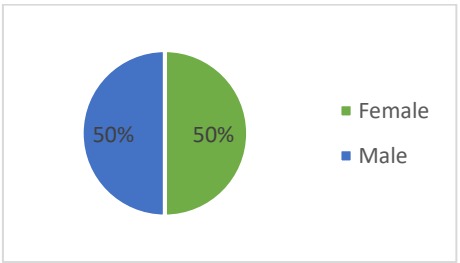
Total data analysed from all the responds are presented in this document, demographic data as first section, and other data (all 17 Questions) are presented as components of outputs in the four following sections.

Demographic data

Age of the respondents:



Gender:



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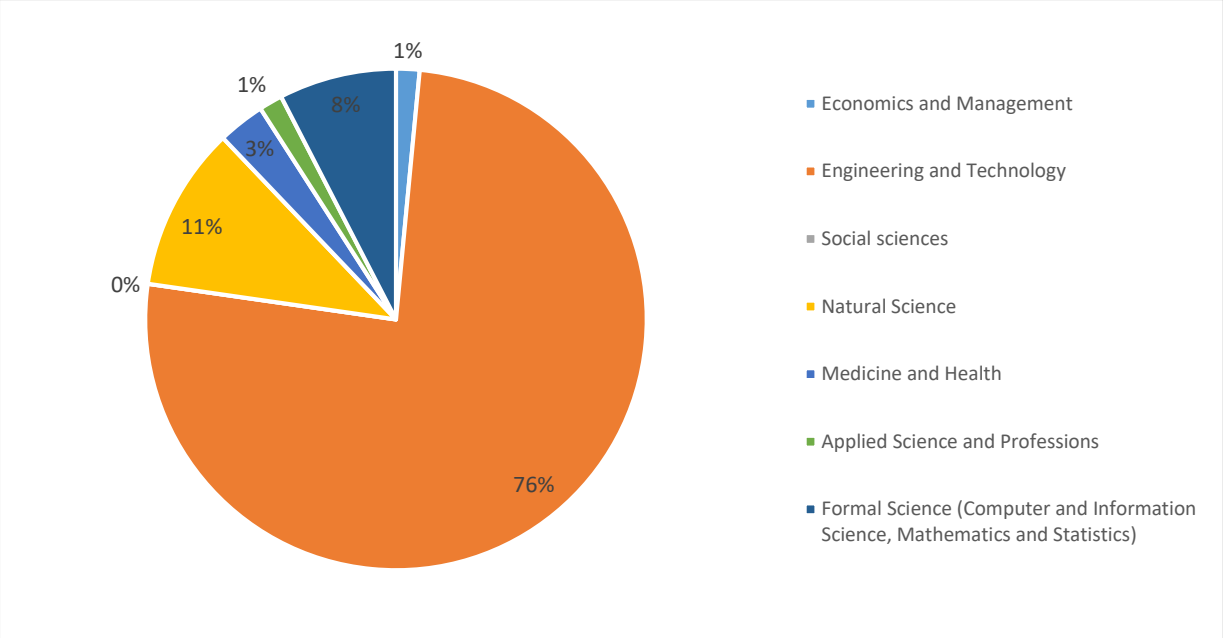
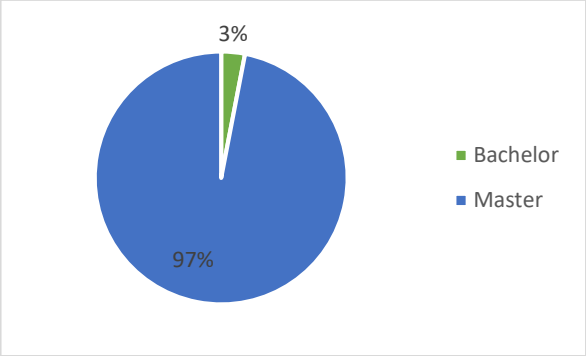
Academic disciplines:



Level of Studying:



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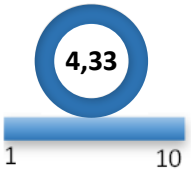
1. Motivation towards Entrepreneurship

The output of motivation towards entrepreneurship is based on two questions of the Survey (number 6 and 10), level of involvement in entrepreneurial activity and individual interest towards startup activities.

1a. Level of involvement in University entrepreneurship activities

Mean Score:



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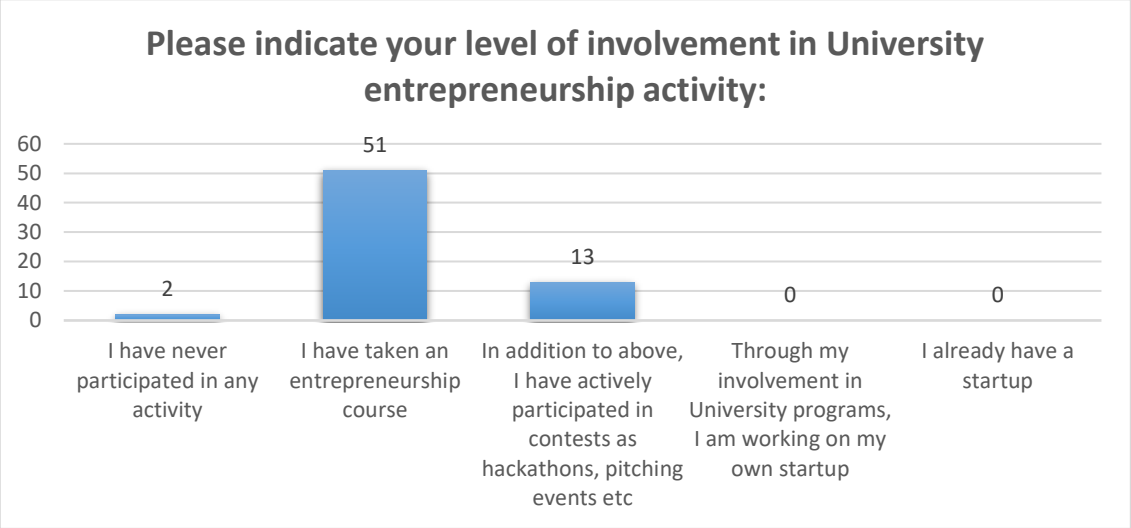
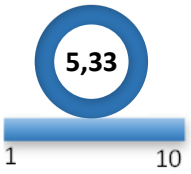
Q: Please indicate your level of involvement in University entrepreneurship activity:

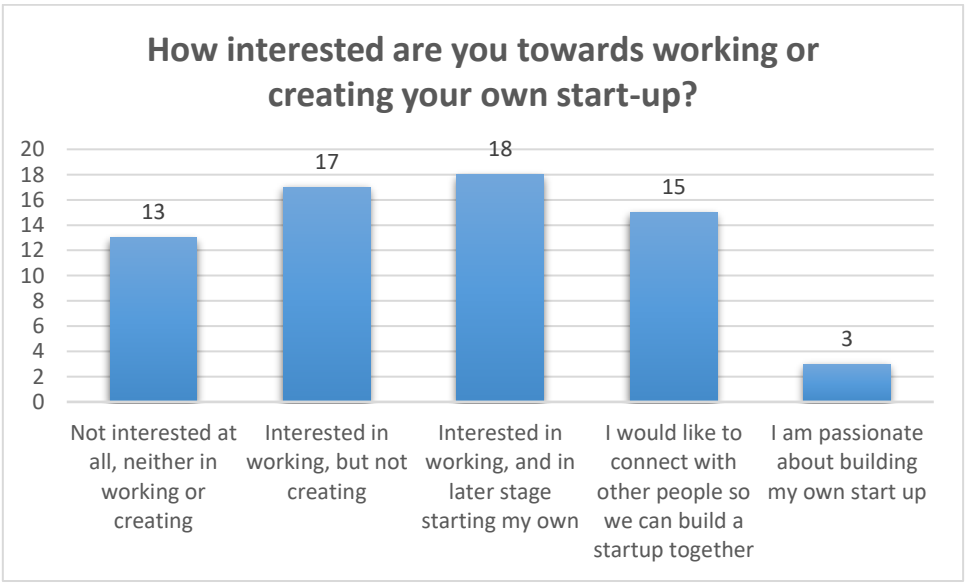


1b. Interested towards working or creating start-up

Mean Score:



Q: How interested are you towards working or creating your own start-up?



Majority of respondents (72%) have participated in entrepreneurship course and respondents have highly indicated the interest in working for a startup or connecting to other people in order to build a startup.

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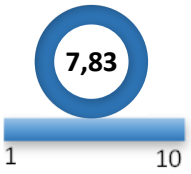
2. Awareness of entrepreneurial opportunities on University

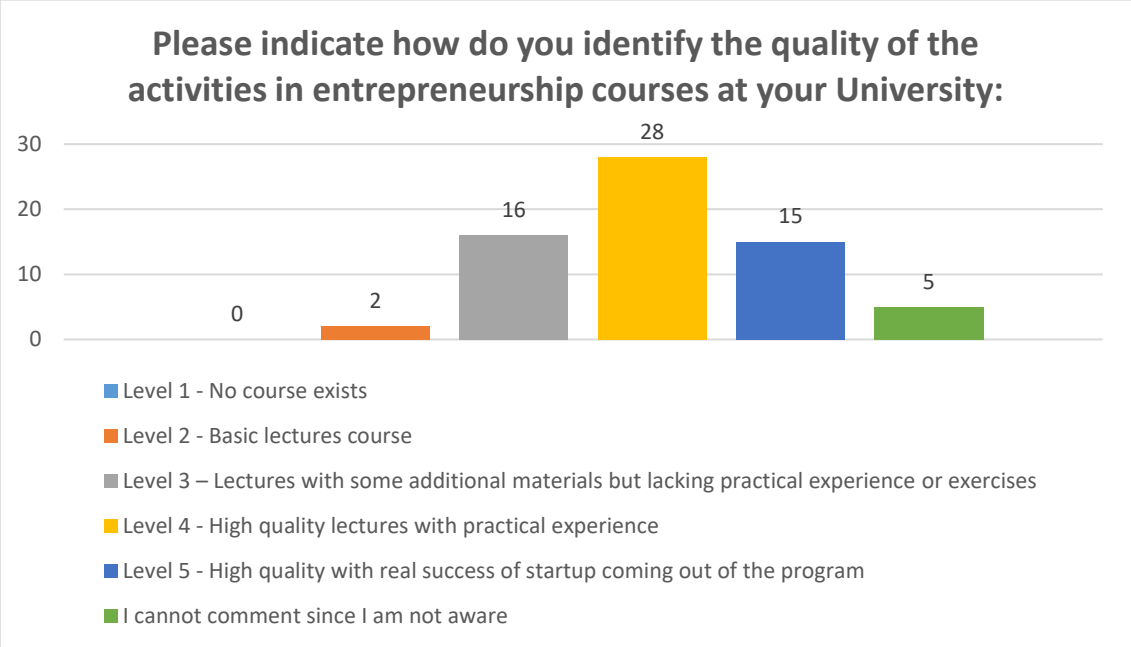
The output of Awareness of entrepreneurial opportunities on University is based on four questions of the Survey (number 7,8,9 and 11) and include: quality of the activities in entrepreneurship courses, quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events and individual interest towards startup activities, what kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events and involvement of student organizations in entrepreneurship activities.

2a. Quality of the activities in entrepreneurship courses

Mean Score:



Q: Please indicate how do you identify the quality of the activities in entrepreneurship courses at your University:



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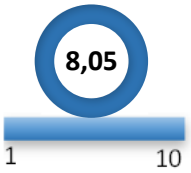
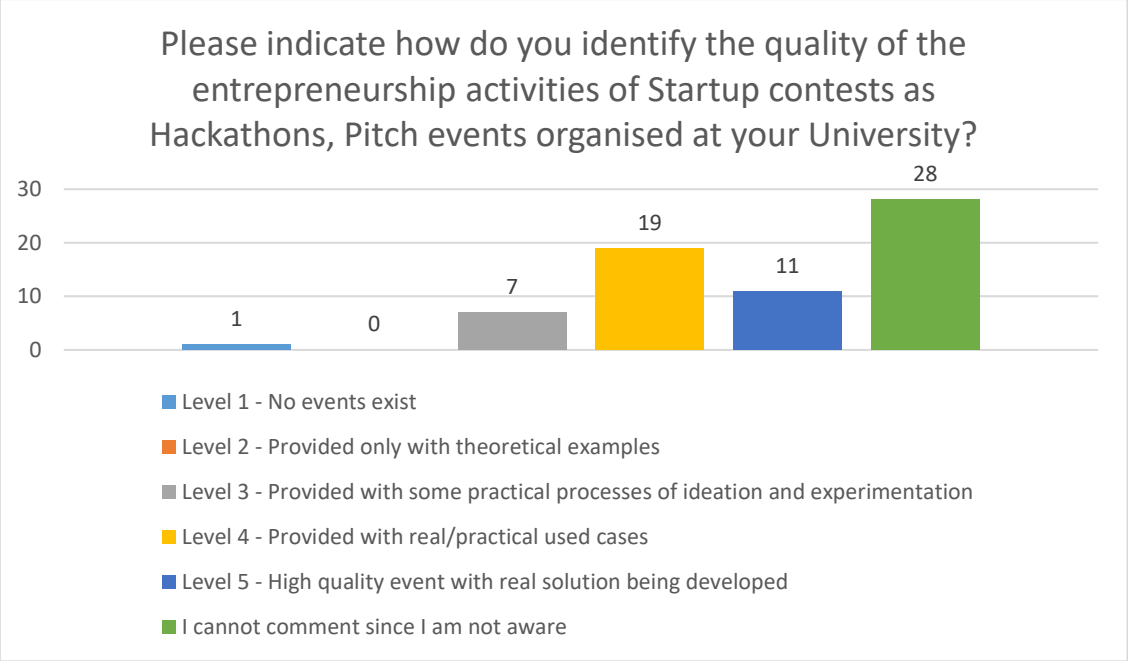
2b. Quality of the entrepreneurship activities of Startup contests

Mean Score:

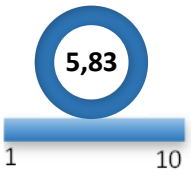


Q: Please indicate how do you identify the quality of the entrepreneurship activities of Startup contests as Hackathons, Pitch events organized at your University?



2c. Services provided by University other than entrepreneurship courses and entrepreneurship/startup events.

Mean Score:



Q: What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/startup events?

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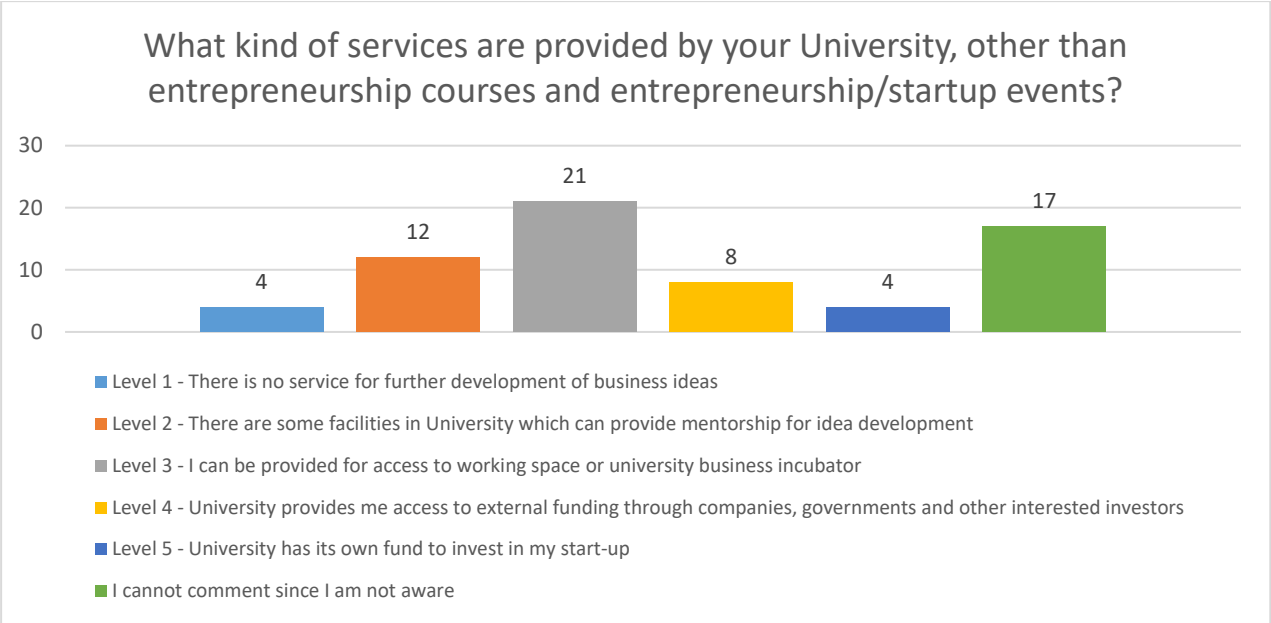
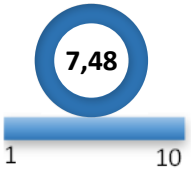


2d. Involvement of student organizations

Mean Score:



Q: How involved are your university student organizations in entrepreneurship activities?

To all questions in this output an option *I cannot comment since I am not aware* was given as a variable of the answer. The reason was filtering the respondents which did not have any

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activity or awareness and having an option of observing results without this variable in order to have more exact overview. This information can be relevant in two ways, firstly, if the activities exist and students are not aware, this can signalize to focus more on promoting the activities or to further development of awareness activities. Secondly, if the activities are not in development phase (usually situation is different for faculty to faculty on the University and please be advised to look at the structure of academic disciplines of this Survey) this can signalize need for further advancement of the entrepreneurial activities and raising the stage of activity on entrepreneurship.

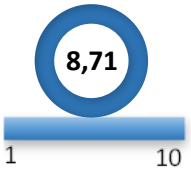
For all four questions of this output, the variable *I cannot comment since I am not aware* is around 30%, signalizing **low to medium level of awareness** (different from question to question). After taking out this variable, and observing the rest of the results, respondent have mainly chosen levels 3 and 4 **(medium to high level) on quality of entrepreneurial courses and entrepreneurship activities** of Startup contests as Hackathons, Pitch events. In the area of other services provided by University, respondents are mostly aware of access to working space or university incubator. Respondents have indicated (with high percentage of unawareness), that the student organizations mostly have monthly and yearly initiatives.

3. Skills Set

The output of Skill set is based on three questions of the Survey (number 12,13 and 14) and include: Soft/21 century skills, financial and technical skills. The questions consisted of 3 groups of Likert-type items designed to assess students' overall confidence on soft, technical and financial skills. These items used a five-point response scale (1=Not Confident to 5=Extremely Confident) and prompted students to indicate the degree to which they individually agree (feel confident) with each skill and ability. The three figures of skills will be presented on the scale from 0 to 10.

3a. Soft skills

Mean Score:



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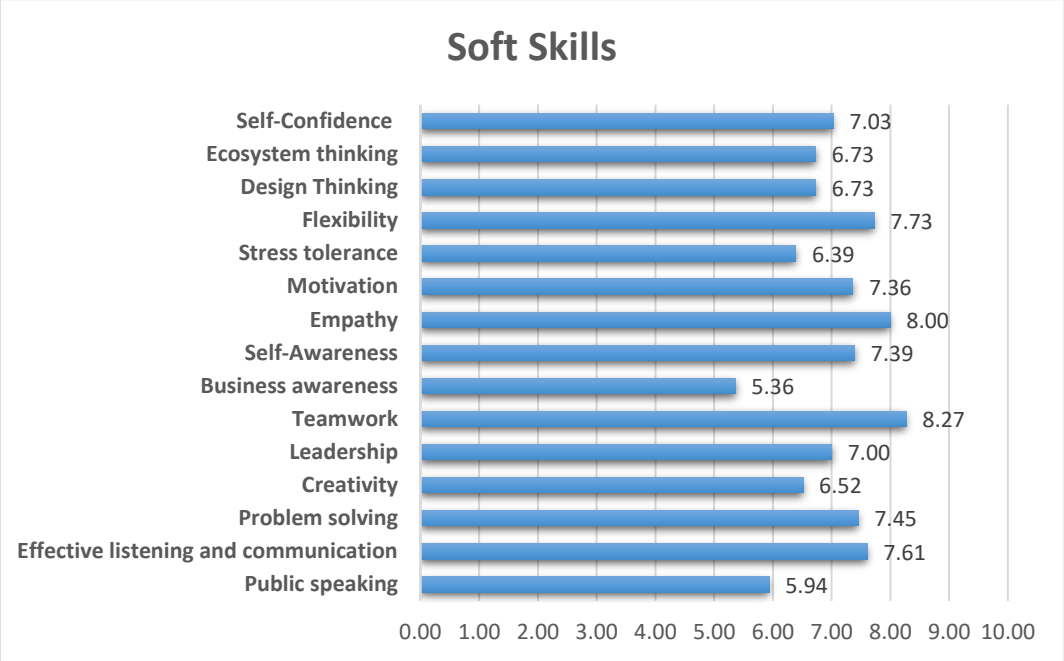
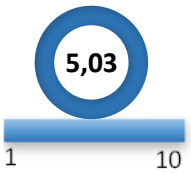
Q: Please indicate your level of confidence in the following soft skills and competences on the scale from Not Confident to Extremely Confident.



Teamwork, Empathy and Flexibility have been selected from the respondents as the skills with which they feel mostly confident, and Public Speaking and Business Awareness as the least confident ones.

3b. Financial skills

Mean Score:



Q: Please identify your confidence in ability to execute the following financial skills on scale from Not Confident to Extremely Confident.

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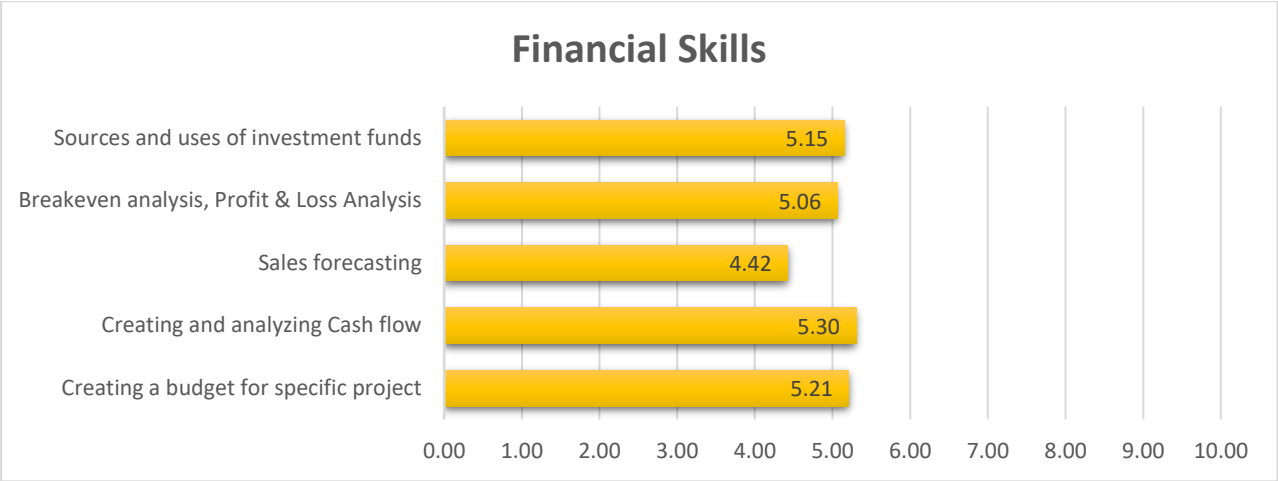
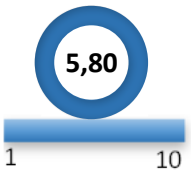


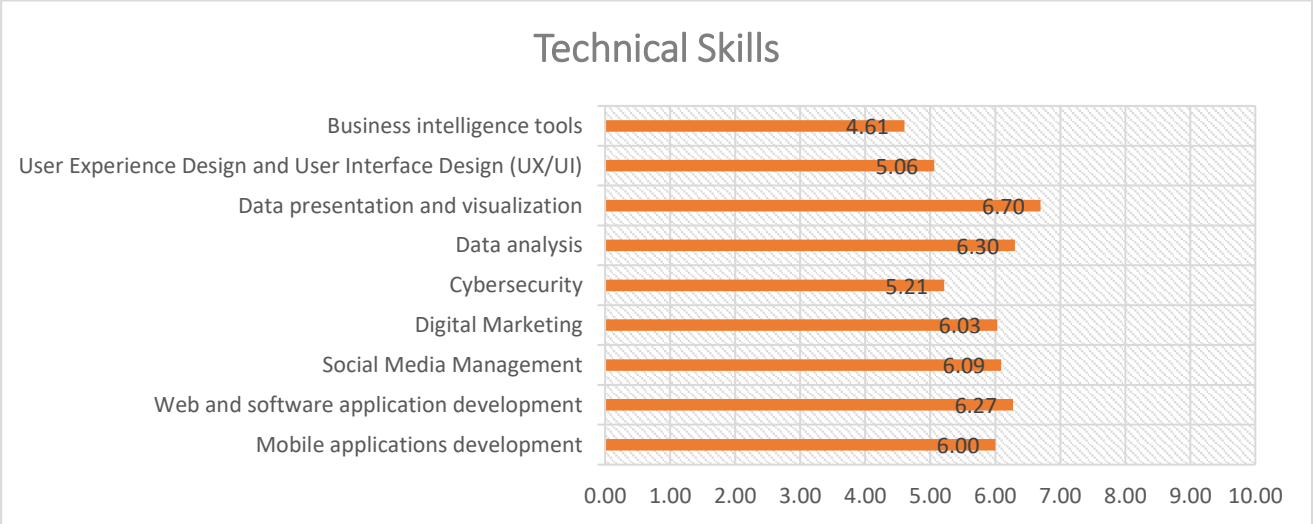
Highest overall rate selected by the respondent from the financial skills are Creating a budget and creating and analysing Cash Flow, and lowest response rate had Sales Forecasting.

3c. Technical skills

Mean Score:



Q: Please identify your awareness and ability to execute the following technical skills and themes on the scale from Not Aware to Expert user.



Highest overall rates selected by the respondent from the technical skills are Data presentation and visualization and Data Analysis, and Cybersecurity and User Experience Design as the lowest rated in awareness and experience by the respondents.

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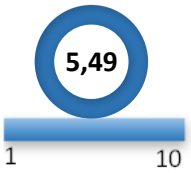
4. Usage of external learning resources

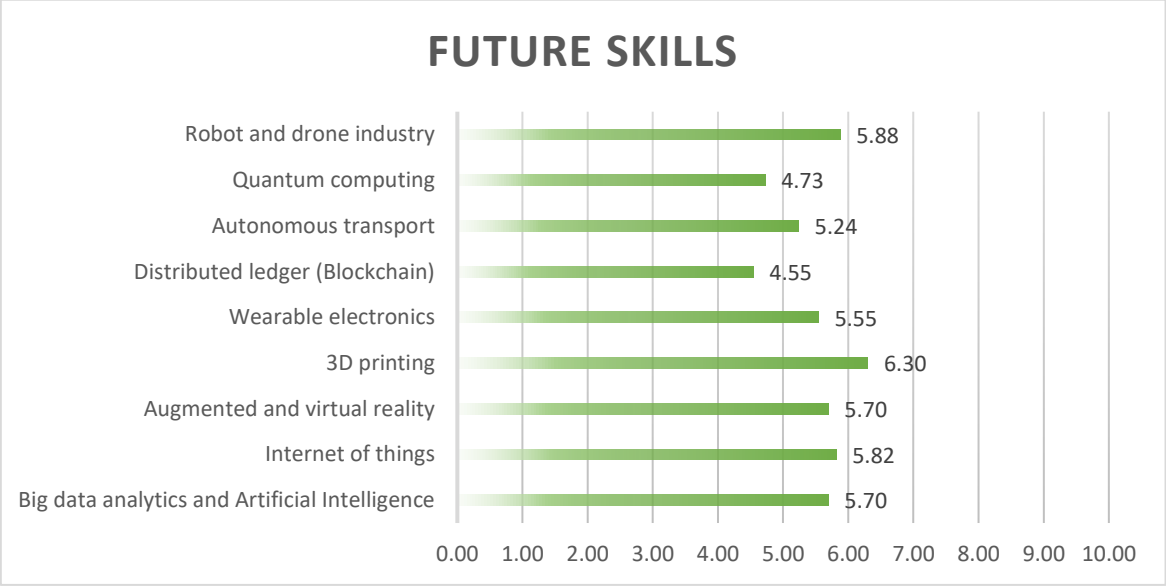
The output of Usage of external learning resources is based on three questions of the Survey (number 15, 16 and 17). This output included question on Likert-type item of adaption of new technology designed to assess awareness of selected new technologies (five-point response scale from 1=Not Aware of it; to 5=I am very passionate in using this technology and have become an expert user). Last two questions included multiple choice question on frequency of external resources usage and different types of on-line learning platforms.

4a. Future Trends

Mean Score:



Q: Please identify your awareness and knowledge of the following topics on the scale from Not Aware of it to Expert user.



Respondents are mostly experienced or practiced new technologies and trends in the areas of 3D printing and Robot and Drone Industry, and least knowledgeable in Blockchain and Quantum Computing.

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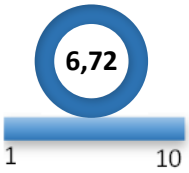
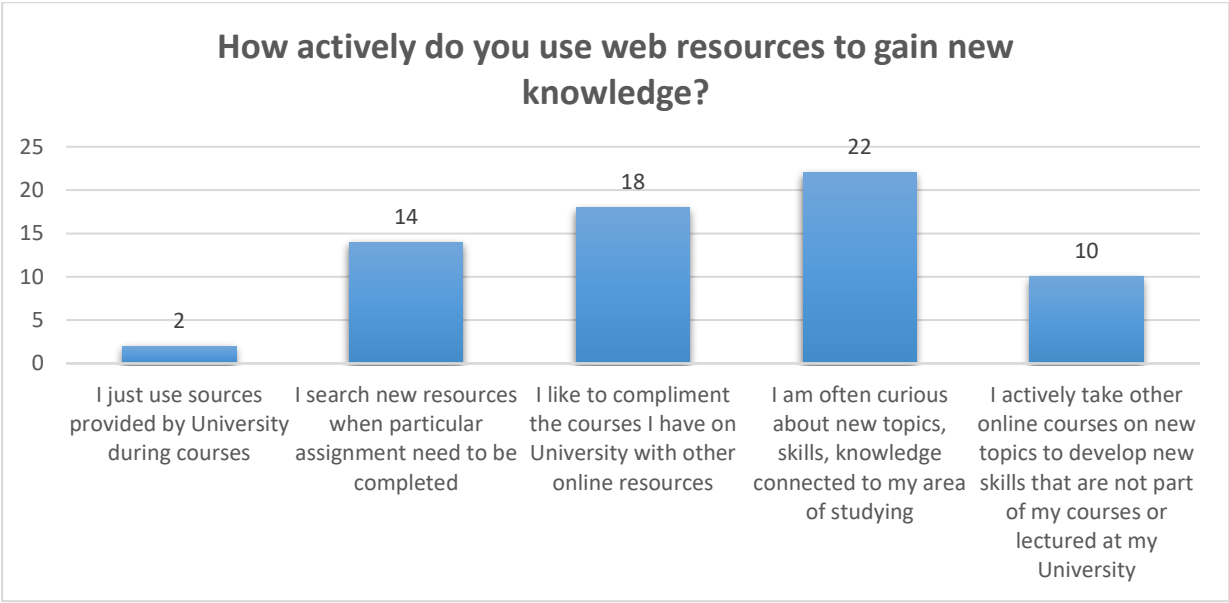
4b. Usage of web resources

Mean Score:

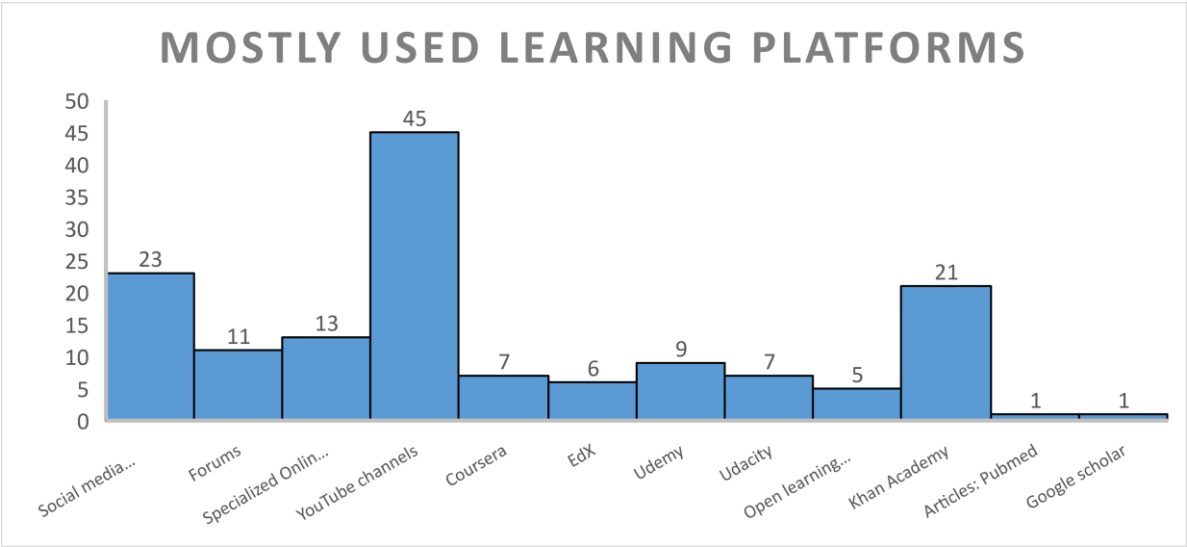


Q: How actively do you use web resources to gain new knowledge?



High response rate of students indicates often curiosity and update on the knowledge connected to the study area and complimenting the university courses through other online resources.

Q: What kind of online learning platforms do you use to gain new knowledge:



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Mostly used learning platform is YouTube followed by Social Media groups and Specialized Online Communities.

8. Best practices of student entrepreneurship programs

Based on the results from the analysis of talent model acquisition, best practices of student entrepreneurship and different University programs for incubation and acceleration phases have been recommended. Programs are presented in the short form of featuring the context of development and key highlights of the successful initiatives.

8.1. Manchester Entrepreneurs

Short overview of the initiative:

Manchester Entrepreneurs has a goal to help, inspire, and educate students by encouraging entrepreneurship and intrapreneurship through various events and programs. Whether students be studying law or working with IT, ME's goal is to foster their interest in startups and help them achieve their goals, even if they don't consider themselves an entrepreneur. What's special about ME is the diversity of their outreach into communities. Initiative includes various events to cater to students across the spectrum, no matter what their needs are.

One of the events is Manchester's What's Next conference, which is one of the largest one-day entrepreneurship conferences in the northwest of Europe.

Another initiative the members of ME are working on is Accelerate ME, Hire ME, and Meet ME, which are all a series of events that aim to connect students with a larger ecosystem of startups. It is an early stage recruitment platform for students looking into startups after university and directly helps students make those connections with smaller companies

Highlights of the initiatives: startup creators, connecting students to companies and ecosystem, recruitment platform

Links: www.manchesterentrepreneurs.co.uk

https://www.visitmanchester.com/whats-on/what-next-conference-p367251

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8.2. UCL Entrepreneurs

Short overview of the initiative:

Founded in 2007, UCL Entrepreneurs has always been inspired by one objective: assisting student's entrepreneurs and promoting entrepreneurship.

Inspire. Catalyse. Grow. Succeed. To inspire students in the community UCL host events where students can meet other entrepreneurs. For example, one of their most successful events is Hatch London which is a hackathon focusing on gender diversity in technology. At this event student interested in technology or business ventures are presented with problems companies are facing and asked to solve them using code and collaboration. In addition to hatch London, they have the London Startup Fair and UCL Business Game. The goal of all these programs is to expose students to real world problems that challenge startups and large corporations and give them the opportunity to solve these issues. Within this, they promote entrepreneurship and intrapreneurship as a practical career option.

The Venture Capital Fund and Moonshot Launchpad are two initiatives which give early stage startups the skills and resources to turn a simple idea into an actual business model. Entrepreneurs can receive equity free growth capital through VC fund and to develop their business model into an MVP.

Highlights of the initiatives: Entrepreneurship, Intrapreneurship, venture capital fund

Links: https://ucle.co/

https://www.hatchlondon.io/

8.3. Warwick Incubator

The Warwick Incubator at Warwick University is the UK's first student run business and entrepreneurial incubator. It as an early stage incubator, created to help students who have an idea turn it into a business with services as mentoring.

The incubator has a 3-stage programme for potential startups/ business ideas. During the first few weeks, the business is tested to see if the idea is truly viable. In the second stage, the target market/ audience is identified. In the third and final stage, growth is addressed and focusing on pitching and investment assistance.

Aside from mentoring sessions and the programme, the incubator is also responsible for putting together certain events and day trips. The 'Mentor Day' that the incubator hosted had 25 mentors for each of the incubator's 25 startups.

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The Warwick Incubator doesn't specialise in a single industry, but mostly business ideas tend to be more technology based. Some recent ideas/ startups to come out of the incubator include a ticketing app that gives users a fairer way to buy tickets online.

http://warwickincubator.com/

Highlights of the initiatives: mentorship, incubation, various events

8.4. I3P, Politecnico di Torino

Short overview of the program:

I3P first aim is to support young web entrepreneurs and for this reason they are running a program divided into 2 main sections: pre-incubation and incubation. During the first phase a young entrepreneur can present his project (or just an idea). The team is accepted only if there's a minimum number (basic roles already identified). During this first phase every team is working on its business plan, business model, team building and its economic resources. All the services provided during this first period are for free (there's actually a symbolic 50€ fee in order to discourage those who just want a free space to work on their own). The preincubation period is lasting maximum 1 year (the duration can take longer only for certain kinds of industries like biomedical, where prototypes and certifications are required). Once the company has a defined structure, it can request to enter the incubator through an evaluation committee (composed of: investment funds, entrepreneurs, managers or ex managers, I3P shareholders). After its selection, the Company starts paying the incubation services: space and strategic consulting (Business development and fundraising). The Company can also decide to pay just for the strategic consulting (virtual incubation). The average duration of this period is about 3 years (+2 extra years just for very strategic projects). After the first 18 months a review is performed in order to evaluate if carry on with the incubation. No equity is taken from I3P.

I3P brings a real added value to a young entrepreneur in the following fields: strategic consulting, fundraising (BA, VCs, Banks…), technical development consolidation (mainly through the research and technological transfer area of Politecnico di Torino - SARTT), networking in order to put the companies in contact with possible customers (big companies like Oracle, Ferrero, Miroglio come to I3P 1-2 per month for innovative products or services scouting).

Highlights of the program: preincubation, incubation, consulting services, networking

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8.5. Venture Catalyst Challenge

Short overview of the program:

The Venture Catalyst Challenge (VCC) gives the opportunity to develop the entrepreneurial skills, mid-set and networks they need to translate ground breaking ideas into real-world impacts – be it creating a new product, launching a new startup venture or leading a new initiative within an existing organisation – for the benefit of society. The Lab offers Imperial students' free access to a range of extra-curricular entrepreneurship programmes, competitions, and events, as well as 2,000 square feet of co-working space. Initiative connects student entrepreneurs to the expertise they need to advance their ventures. This includes mentoring with industry experts, business coaching, pitch performance training and expert guidance. The Venture Catalyst Challenge (VCC) is an annual pre-accelerator for both present under-graduate and post students and recent graduates of Imperial University London. The VCC is designed to test the commercial viability of participants early-stage science and technology ideas. To this end the VCC programme incorporates elements of Stanford Universities Design Thinking course, the principles of Lean Start-Up methodologies, tools such as the Business Model Canvas and Lean Start-up Canvas and the latest in Customer Development Methodologies. The format is evening masterclasses and workshops for 6 weeks. The program culminates in an annual Showcase, at which the University gives out a cash prize. The university draws in some of the most powerful corporations in the world, top innovators and mentors with specific expertise to work 1:1 with the student startup businesses and the focus is to move the startups forwards as fast as possible. The Venture Catalyst programme has been designed and delivered to meet the specific challenges facing student/ graduate tech entrepreneurs. For instance, workshops are scheduled not to clash with lessons at times that most students can attend. In fact, the VCC recognize that in term time most students only have 10-15 hours per week spare to work on their Startup, making it effectively part-time. To make best use of this time the VVC teaches the student entrepreneurs to use goal-setting and information curation to ensure that the learning and for this to be time-efficient. To provide the teams with additional manpower the VCC have sourced a series of paid start-up internships from Imperial companies to support entrepreneurs over the summer if they don't have the resources to keep working on their idea.

https://www.imperialenterpriselab.com/programmes/vcc/

Highlights of the program: pre-accelerator, early-stage science and technology ideas, mentorship, company networking

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8.6. Entrepreneur First

Short overview of the program:

Entrepreneur First http://www.joinef.com is a six-month full-time programme for talented technologists. They select individual's predominately graduates from top UK Universities such as Cambridge, UCL, and Warwick and help them build their startups from scratch. Entrepreneur First objectives are to build the most valuable deep tech startups in Europe. EF selects elite individuals only, based on their technical talent and founder abilities. They typically take three kinds of people. 1) Computer Scientists and engineers straight from university, 2) PhDs and research professionals, 3) Developers from startups and corporates. They recruit from across Europe and bring the individuals to London and each cohort has 50-60 individuals in it. The programme is six months long and starts twice a year, March and September.

The focus on selecting only people that are able to build their first Minimum Viable product means that EF is unique amongst accelerators in being able to recruit on to their programme individuals with a "burning" desire to be entrepreneurs prior to them having a team and prior to them having a product. EF then provides them with the know-how, skills and connections to build out the team, carry out the research and customer development to identify the problem they wish to solve using technology and then build out and test the first solution. Taking talented individuals prior to the ideation stage is one of the reasons that unlike the standard accelerator model, EF takes 6 months to complete. The lengthier period also means EF can help the individuals to form co-founding teams with each other, work out what idea to work on and gain traction for demo day. Demo Day happens in the final month of the programme. More than 200 investors watch the startups do a three-minute pitch and they have a good track record of helping participants raise seed investment. The total valuation achieved by teams that have graduated through the EF accelerator programme is over $150m, having raised over $30m in venture capital. Investors include Index Ventures, Notion Capital, Balderton, Octopus Ventures, Y Combinator and London Co-Investment Fund.

8.7. ITU GINOVA (Istanbul Technical University Entrepreneurship and Innovation Center)

Short overview of the program:

ITU's main challenge is to address the main challenges faced by young entrepreneurs when starting their business, primarily that they lack entrepreneurial skills, financial literacy and have limited access to financial resources.

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The centre started a program to be the first step for the students who want to start a new entrepreneurial activity. The centre strives to make itself relevant and attractive by offering a mentor team who have different background and competences in business.

The centre works closely with the other organizations in the İTU Ecosystem to create the ecosystem. It organized a design thinking workshop with the topic of 'how to enhance the entrepreneurial ecosystem at ITU', with the participation of directors of these units. This helped the centre and the players identify our challenges and our needs as to how to work in coordination. In order to be visible to the students, the centre chose its location to be in the central area the main campus (beside the central library), where student traffic is very high. It also uses social media channels very actively to involve more students. It organises "open office hours" at Monday evenings which offers students to hangout and increase their network. Moreover, it plans some outdoor activities to meet students for this coming academic year. The centre observes that the students who get mentoring from us are more successful at further stages of their entrepreneurship career. (E.g. accepting to the ITU Teknokent, ease of access to financial resources etc.) In the entrepreneurship education programs, the centre classifies the students according to their level of entrepreneurial efficacy and stage of their business model development and designs programs for each different group such as beginners, advanced and academic path.

Highlights of the program: mentoring, entrepreneurial skills, financial literacy, access to financial resources

http://www.global.itu.edu.tr/

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Conclusion

Aspiring entrepreneurial culture can provide enormous benefits for the university, students, student organizations, startups and all connected stakeholders from local businesses to governments.

Having an active startup culture on University grounds is a win-win situation for all stakeholders in the University supply chain. In order to create an active culture that has a mission the recognize and invest in talented students, components of entrepreneurial setting have to be identified and developed. Entrepreneurial ecosystem on campus is composed from number of components directly connected to University and its stakeholders. University should enable the entrepreneurial ecosystem by providing knowledge, facilities, accelerators, mentoring, startup events, beneficial cooperation and investing opportunities to startups created by students.

This Talent Acquisition Model is designed to identify the specific components of startup ecosystem: individual motivation (for starting or working in a startup), entrepreneurial/business opportunities for students at campus, skill set for developing entrepreneurial mindset, assessing awareness of future technologies and usage of online learning platforms. By identifying the current situation in the CEE Universities by the components of the Talent Acquisition Model, Universities can have a view on how the entrepreneurial activates are perceived in university setting from student's perspective. Moreover, with this information, strategies and actions toward enhancing some points of development or future upgrades in startup university ecosystem can be made. From the Scoreboard document for each University, the results can be the input needed for the future impact (for example looking at Skill set component, it is easy to interpret results and have actions towards development certain set of skills which Universities considers important, but students do not feel confident enough). Also, with more focused actions in University environment, startup will have the higher opportunity to recognize and hire talent. The examples of entrepreneurial activities in Chapter 8. can serve as a good practice to be introduced to CEE ecosystems based on the results of the outputs of the Model (for example, to enhance awareness of entrepreneurial opportunities at the Universities). And finally, looking at other Universities involved in the survey, CEE countries can compare the situation, see their overall standings and possibly make actions towards knowledge transfers in specific fields.

The overall goal is to have the Universities as enablers of startup culture and drivers of change towards entrepreneurial mindset. With Talent Acquisition model, information provided to Universities can serve as one of the bases to fully understand the university ecosystem from

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student's perspective, and strive towards building a novel, inspiring startup culture on the campus.

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Appendix 1.

The Survey used for data gathering in Universities.

Dear students,

This Questionnaire is created in order to identify start-up and entrepreneurial activities, skills and opportunities you have at your University.

So, what's in it for you?

By going through the Questionnaire, you get to evaluate yourself and map out some strength, skills and motivations you have. Also, you might identify some areas where you can upgrade your skills.

Based on your valuable responses, we will provide the University with all of your constructive feedback in order to identify strengths and give recommendations to develop new entrepreneurial opportunities.

Your involvement will help create an advanced entrepreneurial environment in your University!

This questioner is short and easy, you will only need 7 – 10 minutes.

Thank you!

Demographic data

1. Please select you age group:
   - Less than 18 years' old
   - 18-24 years' old
   - 25-30 years' old
   - 31-45 years' old
   - More than 45 years' old

2. To which gender identity do you identify with:
   - Female
   - Male
   - Other: _____

3. Please indicate the University you are currently having your studies.

   Czech Republic - The Czech Technical University in Prague (CTU)

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Czech Republic - University of Economics Prague
Czech Republic - Czech University of Life sciences Prague
Slovenia - University of Ljubljana
Slovenia - University of Maribor
Slovenia - University of Primorska
Romania - Babes-Bolyai University (UBB)
Romania - Technic University (UTCN)
Romania - West University of Timisoara (UVT)
Romania - "Alexandru Ioan Cuza" University (UAIC)
Romania - Bucharest University (UB) or SNSPA
Spain Republic - University of Salamanca
Portugal Republic - University on NOVA Lisboa
Israel - University of Bar-Ilan
Other: Please specify

4. Please Indicate your field of study:
- Economics and Management
- Engineering and Technology
- Medicine and Health
- Natural science
- Formal Science (Mathematics and Statistics)
- Humanities
- Social sciences
- Applied Science and Professions
- Other:.....

5. Please indicate your current program/level of studying:
- Bachelor
- Master
- Doctoral/PhD
- Post-Doctoral

6. Please indicate your level of involvement in University entrepreneurship activity:
- I have never participated in any activity
- I have taken an entrepreneurship course
- In addition to above, I have actively participated in contests as hackathons, pitching events etc
- Through my involvement in University programs, I am working on my own start-up
- I already have a start-up

7. Please indicate how do you identify the quality of the following entrepreneurship activities in your University:

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Entrepreneurship courses:

- Level 1 - No course exists
- Level 2 - Basic lectures course
- Level 3 – Lectures with some additional materials but lacking practical experience or exercises
- Level 4 - High quality lectures with practical experience
- Level 5 - High quality with real success of start-up coming out of the program
- I cannot comment since I am not aware

Start-up contests as Hackathons, Boot-camps, Pitch events etc.:

- Level 1 - No events exist
- Level 2 - Provided only with theoretical examples
- Level 3 - Provided with some practical processes of ideation and experimentation
- Level 4 - Provided with real/practical used cases
- Level 5 - High quality event with real solution being developed
- I cannot comment since I am not aware

8. What kind of services are provided by your University, other than entrepreneurship courses and entrepreneurship/start-up events:
   - Level 1 - There is no service for further development of business ideas
   - Level 2 - There are some facilities in University which can provide mentorship for idea development
   - Level 3 - I can be provided for access to working space or university business incubator
   - Level 4 - University provides me access to external funding through companies, governments and other interested investors
   - Level 5 - University has its own fund to invest in my start-up
   - I cannot comment since I am not aware

9. How interested are you towards working or creating your own start-up?
   - Not interested at all, neither in working or creating
   - Interested in working, but not creating
   - Interested in working, and in later stage starting my own
   - I would like to connect with other people so we can build a start-up together
   - I am passionate about building my own start up

10. How active are your university student organizations in entrepreneurship initiatives?
    - Level 1 -We do not have any active student organization involved with entrepreneurship initiatives
    - Level 2 -The student organizations organize from time to time talks on different entrepreneurship themes

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- Level 3 - the student organizations are involved in organizing events as Job Fests and other activities for carrier development
- Level 4 - the student organizations are actively organizing entrepreneurship activities as Hackathon's, Boot-camps, Idea development, and other start-up events
- Level 5 - we have an active alumni network that can connect us to corporates and investors
- I cannot comment since I am not aware

Skills development

11. Soft skills and competences

Please indicate your level of confidence in your **soft skill and competences on** the 5-point scale from Not Confident to Extremely Confident. Below each skill is a practical definition of what is the ability that you have while possessing a certain skill.

	Not Confident	Slightly Confident	Moderately Confident	Very Confident	Extremely Confident
Public Speaking I can easily present and speak publicly and make a talk/speech to various audiences.					
Effective listening and communication While talking to others, I am able to concentrate and listen with understanding of people's perspectives and provide a constructive feedback.					
Problem solving I am able to identify problems, conduct appropriate analyses in seek of best solutions and involve others in seeking focused solutions.					
Creativity I am able to use my knowledge and imagination to create innovative concepts and ideas.					

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Leadership I have the ability to inspire and bring people around idea and set goals and values for the team.					
Teamwork I am able to work and collaborate productively in diverse teams with different cultural backgrounds/mindsets, and effectively negotiate differences.					
Business awareness I have the ability to discover and recognize the opportunities in business landscape and transform them in sustainable model.					
Self-Awareness I am able to recognize and understand my emotions, feeling, behaviours and make continues self-improvement.					
Empathy I am able to understand how people around me feel and how to effectively respond to their emotions.					
Motivation I am able to motivate myself to accomplish the tasks and goals that I have set for myself.					
Stress tolerance I am able to keep my stress levels under control in a difficult control while I seek for a solution.					
Flexibility I am open-minded and have ability to quickly adapt my ideas to make use of emerging opportunities.					

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Design Thinking I am able to understand different sides of the problem, challenge assumptions to identify alternatives, ideate and test solutions that might not be instantly apparent.					
Ecosystem thinking I can consciously make actions considering all stakeholders in the system including environmental and cultural factors to accomplish a meaningful outcome.					
Self-Confidence I trust myself that I have the ability to ultimately achieve my set goals.					

12. Financial skills

Please identify your confidence in ability to execute the following financial skills on the 5-point scale from Not Confident to Extremely Confident.

	Not Confident	Slightly Confident	Moderately Confident	Very Confident	Extremely Confident
Creating a budget for specific project					
Creating and analysing Cash flow					
Sales forecasting					
Breakeven analysis, Profit & Loss Analysis					
Sources and uses of investment funds					

13. Technical skills

The following table consist of technical skills and technologies.

Please identify your awareness and ability to execute the following technical skills and themes on the 5-point scale from Not Aware to Expert user.

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	Not Aware of it	Have hear of it, but don't know how its used	I am aware and know of some used cases	I have some experience and have been involved in some used cases	I am very passionate in using this technology and have become an expert user
Mobile applications development					
Web and software application development					
Social Media management					
Digital Marketing					
Cybersecurity					
Data analysis					
Data presentation and visualization					
User Experience Design and User Interface Design (UX/UI)					
Business intelligence tools					

14. Adaptation of new technologies

The following list consist of the used cases of new technologies in digital era. Please identify your awareness and knowledge of the topics on the 5-point scale from Not Aware of it to Expert user.

	Not Aware of it	Have hear of it, but don't know how it is used	I am aware and know of some used cases	I have some experience and have been involved in some used cases	I am very passionate in using this technology and have become an expert user
Big data analytics and Artificial Intelligence					
Internet of things					
Augmented and virtual reality					
3D printing					
Wearable electronics					
Distributed ledger (Blockchain)					

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Autonomous transport					
Quantum computing					
Robot and drone industry					

15. How actively do you use web resources to gain new knowledge:

- I just use sources provided by University during courses
- I search new resources when particular assignment needs to be completed
- I like to compliment the courses I have on University with other online resources
- I am often curious about new topics, skills, knowledge connected to my area of studying
- I actively take other online courses on new topics to develop new skills that are not part of my courses or lectured at my University

16. What kind of online learning platforms do you use:

- Social media groups
- Forums
- Specialized Online Communities
- Coursera
- EdX
- Udemy
- Udacity
- Open learning
- Khan Academy
- YouTube channels
- Other:.....
- None

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