



ENTRANCE: Enhancing the
ENTRepreneurial mindset of non-
business academics in Europe

State of the art analysis of existing best practices
and academics' competences in entrepreneurial
education

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Project Partners



Introduction

The European Commission sees entrepreneurship as acting upon opportunities and ideas and transforming them into value for others, which can be financial, cultural, or social. European Commission gives an emphasis on the improvement of the entrepreneurial capacity of European citizens and organizations by fostering their entrepreneurial learning and mindset. Therefore, the rationale of ENTRANCE project was the need expressed by European Commission but also the fact that most of the universities as organized institutions are reluctant to commercialize innovative research in order to establish start-ups or spin-offs on their own. However, it is a fact that universities and research organisations, as generators of innovations, cooperate in the process of knowledge generation and become a vital part of the industry world. The project encourages non-business academics and students in HEIs to go a step further by commercialising their innovative ideas into the labour market by developing their own start-up or spin-off and/or by encouraging academics' collaboration with already established firms. All in all, this project encourages academics and students who perform and interpret research to extrapolate how their findings and their ideas could support business sector in Europe.

ENTRANCE is addressed to academics and students who do not have a background in entrepreneurship or any business-related sector. The goal of ENTRANCE program is twofold. First, it aims to develop an entrepreneurship training programme by enhancing the entrepreneurial mindset and competences of non-business academics (such as academics from the areas of Humanities, Arts, Education etc.) and second to equip them with the pedagogical approaches needed to foster the entrepreneurial drive of students. This will be achieved with the implementation of different tasks and methods, such as secondary and primary research and the provision of real-life examples from successful academics turned entrepreneurs.

European Commission recognises the opportunity to be entrepreneurial in any situation: from school curriculum to innovating in the workplace, from community initiatives to applied learning at university. ENTRANCE considers the recognition of entrepreneurship competence as a competence for life and for this reason encourages academics in HEIs to follow and apply pedagogical approaches that reinforce entrepreneurship education. Entrepreneurship Education (EE) has been a part of this focus and the development of the [European entrepreneurship competence framework](#) (EntreComp) creates a shared understanding of the knowledge, skills and attitudes needed to become entrepreneurial, while at the same time emphasizing that entrepreneurship is a competence that all citizens should have the opportunity to develop. The framework also aims at creating a common language between different levels of education and training, as well as bridging the worlds of education and work. This particular framework has constituted the basis of ENTRANCE project providing an underlying structure to support our collective research efforts.

In the beginning of the project and in order to gain a better understanding of entrepreneurship education and non-business academics' entrepreneurial competences, each participating country conducted primary and secondary research.

The aim of this report is to summarise the findings coming from ENTRANCE survey participating countries (Cyprus, Greece, Lithuania, Portugal). The first part focuses on the support and promotion of

entrepreneurship education in HEIs in Europe giving a great emphasis on the four participating countries while the second part provides an overview of the national and international programmes that focuses on entrepreneurship education. The identification of those programmes provides interesting insights of the overall attention that has been paid in this particular topic across participating EU countries but also internationally. Furthermore, a primary research conducted in all implementing partner countries collecting data by questionnaires administered to non-business academics and by semi-structured interviews addressed to industry experts. The information that has been gathered reflects the current situation of entrepreneurship education in HEIs focusing on particular pedagogical practices that reinforce entrepreneurship education, the relationship between research and business industry, and the non-business academics' competences regarding the transformation of a new venture into a business start-up or spin-off.

The EU and National European Contexts

Entrepreneurship education for non-business oriented academics and students has been gaining increasing attention from educators and policy makers, as the EU flagship initiative focusing on investing in knowledge, skills and competences of people of all ages through innovative, digital and flexible learning pathways has been set out in the Europe 2020 strategy as a means to ultimately increase employability, create new job positions, boost growth and enhance innovation and competitiveness across Europe. With the ongoing worldwide health crisis and education, subsequently, being suddenly shifted to online learning, the need to invest in enhancing the entrepreneurial mindset of European citizens via online learning paths becomes more urgent.

While exploring entrepreneurship education in the partner countries, it is important to note some general characteristics relating to each of their backgrounds and start-up development. Firstly, the participant countries come from across the EU geographically, Mediterranean – Southeast – West – North, and include mid & small population size countries.

Entrepreneurial activity increased in all participant countries in recent years, as the national reports indicate, with Portugal and Lithuania demonstrating substantial growth. The majority of start-ups in Portugal show a three-digit growth, according to [Ecommercenews.pt](#), while the rapid expansion of the Lithuanian start-ups ecosystem has attracted significant increasing investments over the past years. According to [Global Entrepreneurship Monitor \(GEM\) report 2020](#), both Cyprus and Greece show an index increase to 8.6% in Total Early-stage Entrepreneurial Activity (TEA), both above the European average. Moreover, according to [World's Bank Doing Business Report 2020](#), in the ease of doing business score among 190 economies Lithuania ranks 11th, Portugal 39th, Cyprus 54th and Greece 79th.

Government policies are in place in Portugal, Lithuania and Cyprus that are in alignment with the above-mentioned EU initiative, an important factor to the entrepreneurial activity growth noted. The policies are implemented by the respective Ministries of Education and aim in enhancing skills and competences, such as critical thinking, problem-solving, self-confidence risk-taking and therefore form a nurturing environment for entrepreneurship development.

Similarly, within this context, Higher Education institutes (HEIs) in all participant countries have developed various courses and initiatives relating to entrepreneurship for non-business students, as a bonus in students' training. Below is a table of the courses and initiatives as identified in the National Reports.

Title	HEI	Country	Target Students	Description
Minor in Entrepreneurship undergraduate programme	University of Cyprus	Cyprus	Students from the Faculty of Engineering, the Faculty of Pure and Applied Sciences and other non-business faculties	Aims to enhance knowledge in technological evolution, business evaluation of tech & other innovations and acquire the necessary knowledge to be effectively engaged in the business field.
Student Innovators Competition	Centre for Entrepreneurship (C4E)	Cyprus	University of Cyprus students	Submit and pitch their innovative business ideas.
Cyprus Entrepreneurship Competition	Centre for Entrepreneurship (C4E) & University of Cyprus	Cyprus	Scientists, start-up founders and hi-tech entrepreneurs	A business plan competition, to transform ideas into real business opportunities. The Competition includes an acceleration programme delivering business-creation workshops and personalised mentoring.
Ennovation competition	University of Nicosia & international network	Cyprus	University students, researchers and research teams	Features three streams aiming primarily to commercialize research innovative ideas.
MSc in Entrepreneurship	University of Thessaly	Greece	University students, business executives and young scientists	Supports the acquisition Career Day for Start-ups of contemporary knowledge & business planning skills to develop sustainable businesses.
Startups Career Day	AUEB Innovation and Entrepreneurship Unit	Greece	Students & Entrepreneurs	Interested parties gain useful work experience in a dynamic and innovative environment with excellent development prospects.
MITOS program	University of Crete	Greece	Young researchers	Provides critical knowledge, internships and consulting to support research commercialization.

Technology Entrepreneurship module	Kaunas University of Technology	Lithuania	Students	Applying Silicon Valley teaching methodologies, practically demonstrating the transformation of research and ideas into real-world businesses.
Innovation and the global knowledge economy module	Kaunas University of Technology	Lithuania	PhD Students	Develop competence in R&D and innovation activities by systematically assessing the context of the global knowledge economy and modelling national, industrial and organizational impact mechanisms.
Biomedical innovation and entrepreneurship module	Lithuanian Health Sciences University	Lithuania	Students	Solutions to improve patient diagnostics, treatment methods, processes, and experiences, to look for new approaches and innovative solutions.
Entrepreneurship academy for students	Vytautas Magnus University Centre	Lithuania	Students	Students learn how to solve social, cultural or economic problems, create and carry out innovative business and social ideas.
310 various courses nationally	Various HEIs	Portugal	Students & Entrepreneurs	Various courses which include the subject of Entrepreneurship in their curricular structure.

Table 1

Courses and initiatives on Entrepreneurship Education by each participating country.

Desk-based research

Best practices & entrepreneurial competences

The first step of State-of-the-art analysis of existing initiatives, best practices of entrepreneurial education and entrepreneurial competences of non-business academics based on EntreComp framework in different contexts, consisted in conducting desk research as well as the collection of data to lay the basis for the innovative creation of OERs (Open Educational Resources) for the ENTRANCE MOOC (Massive Open Online Course). The aim of the MOOC is to enhance the entrepreneurial mindset and competences of both academics and students in non-business fields.

Thus, the project partners gathered information on existing national and international programs (tables are reported in the end of the document) that took place in the past or are still in progress and are related to the aim of ENTRANCE project. This collection of programmes helped to highlight the importance on developing programs that focus on a particular target group – non-business academics and to understand to what extent the topic of entrepreneurship education has been promoted to other academic disciplines except from business and entrepreneurship studies. Best practices regarding entrepreneurial education are also highlighted providing an overview of how entrepreneurial education has been approached across different programmes in Europe. The desk-based research results were developed under the guidelines and templates provided by GrantXpert and they were finalized after the review of all project partners. The gathered data was initially included into the national reports (Cyprus, Greece, Lithuania, Portugal) that can be found here (insert the link).

Considering the characteristics of the national and international programmes, the use of experiential forms of learning has been preferred leading to a deep reflection supportive of transformative learning outcomes. Based on our research, we conclude that there are programmes that support research teams in their attempt to commercialise their research, however most of the reported programmes are addressed to students in HEIs who have a background in a specific area of specialization such as the Information and Communications Technology (ICT). Thus, ENTRANCE tries to fill this gap by developing a training program addressed to academics and students coming from different academic disciplines such as Education, Life Sciences, Art, Engineering.

Primary research

A survey addressed to non-business academics was carried out including 5 parts:

- Part I: The relationship of your university with entrepreneurship
- Part II: Your experience related to entrepreneurship
- Part III: The development and implementation of an idea/activity
- Part IV: Entrepreneurial environment and practices
- Part V: Demographic characteristics

The primary research was conducted through an online questionnaire to a total sample of 68 academics from a variety of universities in participating countries and most of the respondents were in the age range from 31 to 50. The questionnaire was translated in partner languages and was used when needed.

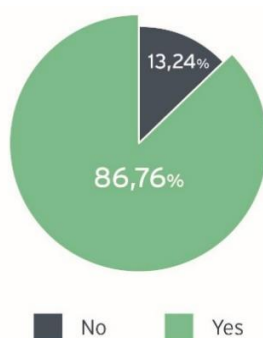
The main purpose of the questionnaire was to collect information in order to gain an idea of the entrepreneurial competences of non-business academics and the pedagogical approaches that reinforce entrepreneurship education.

The results of this analysis are critical for the set-up of the ENTRANCE training programme and specifically for orienting the contents and the structure of the OERs for the MOOC on entrepreneurship education.

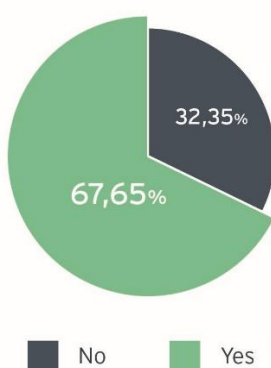
Part I: The relationship of your university with entrepreneurship

The aim of this part was to understand the extent to which respondents' universities support academics, researchers and students with the development of an idea or activity into a start-up or spinoff. For this particular questionnaire, the word idea/activity was defined as *an action that someone initiated related to his/her work or he/she participated in such an action for which he/she was responsible for its development and implementation*. For example, this could be a research project or any other project that took place in his/her university but also outside of it for a short or long time period.

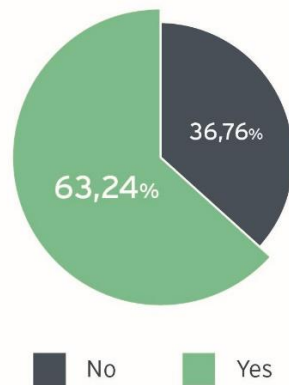
1) Does your university collaborate with local firms (e.g., SMEs, large corporations, start-ups) for the promotion of entrepreneurship culture within the university?



2) Does your university provide to its academics/researchers the opportunity to receive research or innovation funding for the development and exploitation of a business idea?



3) Is there a relevant office or department within your university that supports academics or students in developing entrepreneurial activities?



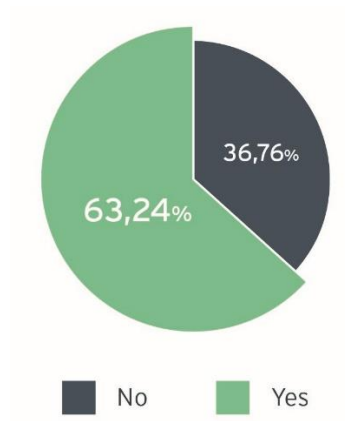
Considering the data across participating countries, we conclude that universities have managed to build a relationship with the industry. Almost 78% of the academics declared that their universities collaborate with local firms trying to cultivate an entrepreneurship culture within the organizations. Similarly, 72,06% of the respondents declared that universities offer an office or department that supports academics or students in developing entrepreneurial activities.

Furthermore, in all participating countries the majority of the respondents declared that they do have the chance to receive a funding for the exploitation of their idea. However, if we consider the results within each country, it is worth to mention that in Portugal the opinions were divided: 55,6% gave a positive answer (yes) and the remain answered no.

Part II: Your experience in relationship with entrepreneurship

The purpose of this part is to understand the possible experience academics may hold in the development and exploitation of a business idea, but mainly to recognise the challenges they have faced (or continue to face) or they have held them back, even if they do not have any experience in the development and the exploitation of a business idea. This information gives us a broader understanding of the possible difficulties academics have faced or are concerned with in their attempt to make their research idea a reality.

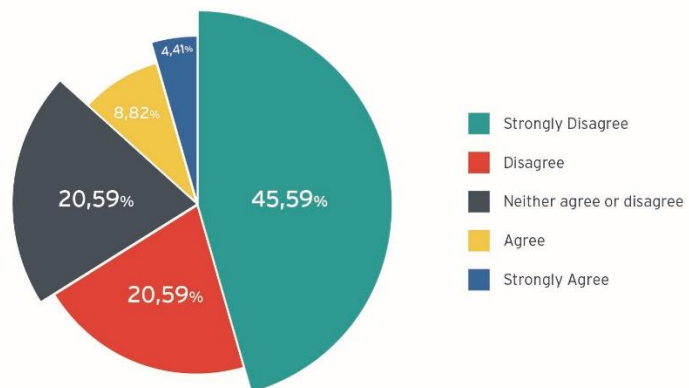
1) Do you have any relevant experience in the development and the exploitation of a business idea?



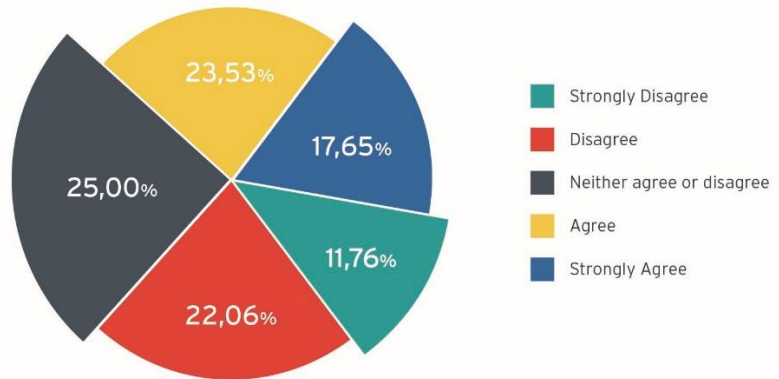
2) Which are the challenges you have faced (or continue to face) or have held you back, even if you do not have any experience in the development and the exploitation of a business idea?

Statements:

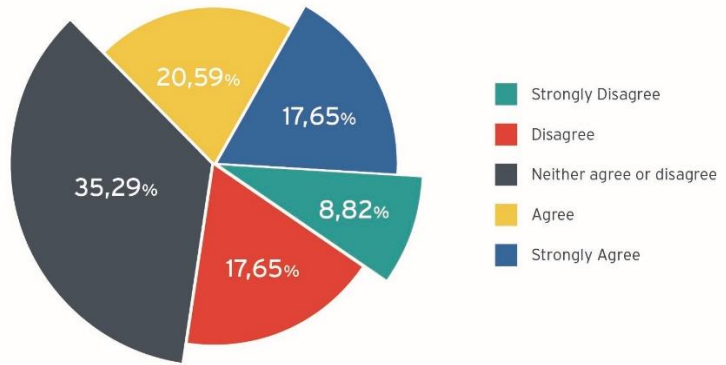
- I never thought to develop and exploit any business idea until now.



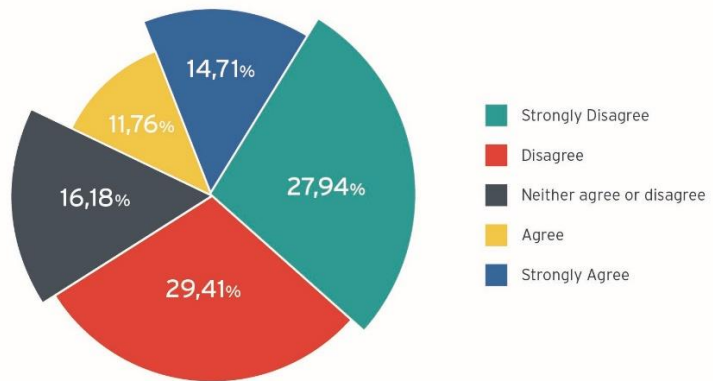
- My university does not provide any incentives for academics to develop entrepreneurial activities.



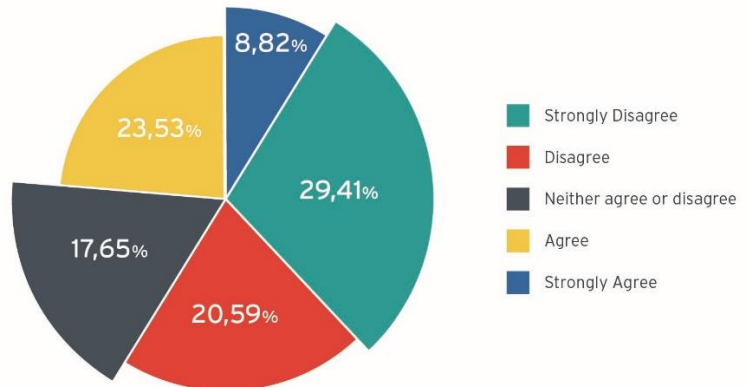
- There is no clear university policy regarding relationship with business.



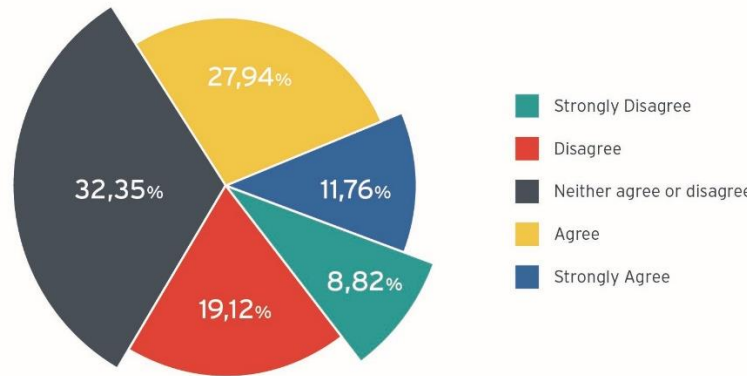
- My university does not have a relevant office/department that supports academics in developing entrepreneurial activities.



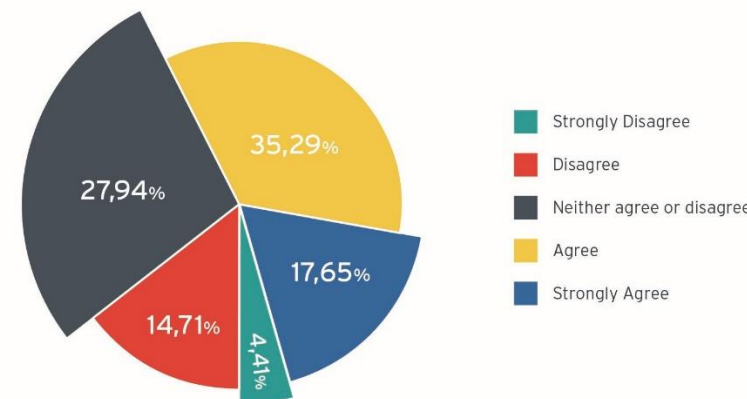
- My research work is more theoretical, it is not so relevant with entrepreneurial activities.



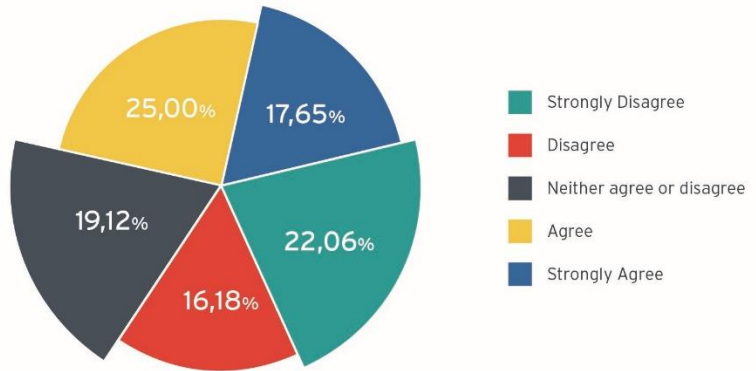
- My colleagues at university are not willing to start working on this new business idea together so I face difficulties in forming a successful team.



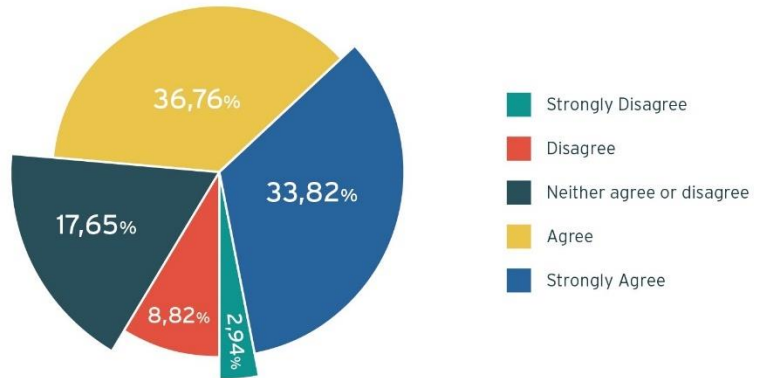
- There are many legal complications between the university and the academics when they start a spin-off and I do not want to get into arguments with my superiors.



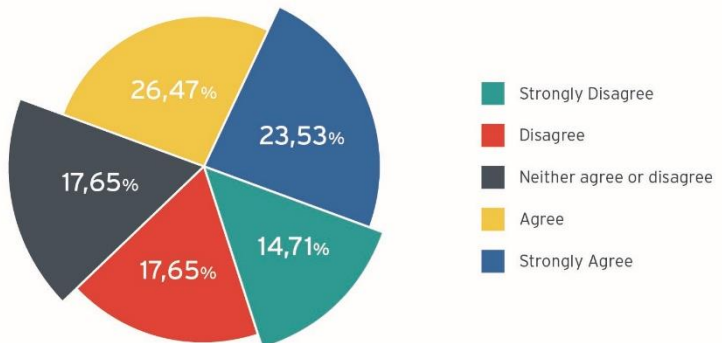
- I am not aware of the Intellectual Property Rights associated with my invention or the procedure that I should follow to protect them.



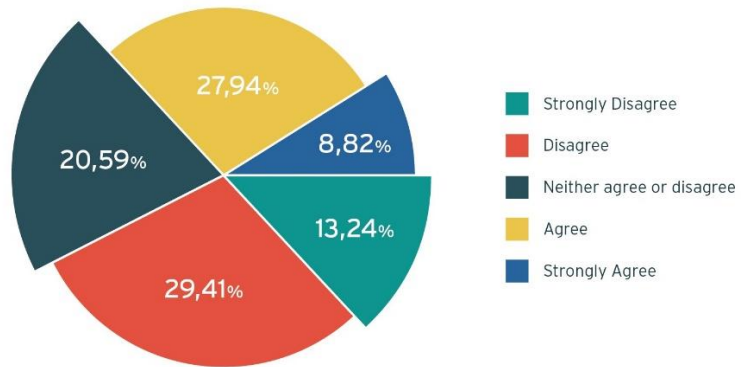
- I work so many hours to conduct other academic tasks that I don't have time to embark in such exploitation/entrepreneurial activities.



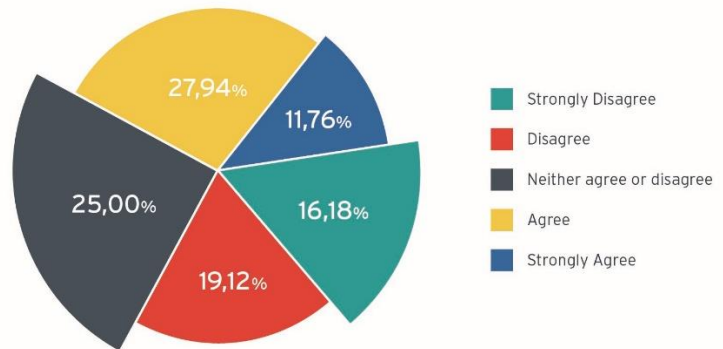
- I do not hold a previous experience of how to start in exploiting my research findings or embarking on entrepreneurial activities (e.g., development of a business plan).



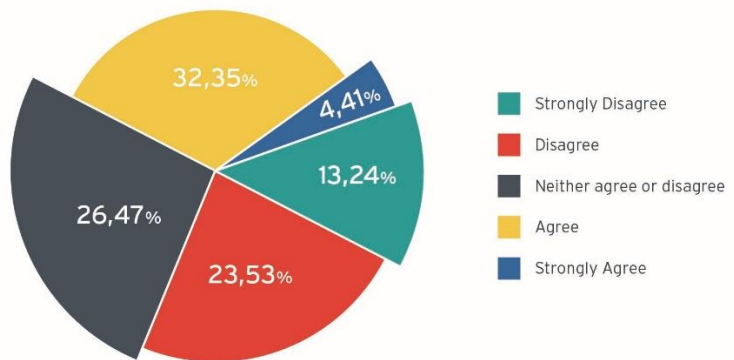
- I am not sure how to identify a business opportunity considering the needs of a particular target group and the characteristics of my business idea.



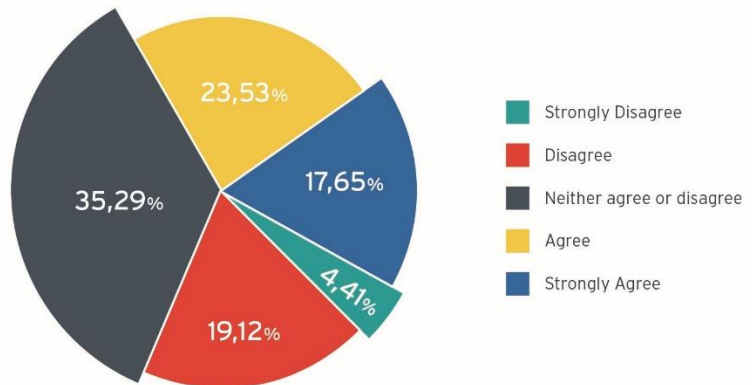
- I am afraid that I won't be successful in my entrepreneurial efforts since I was not trained in this area before thus I avoid starting altogether.



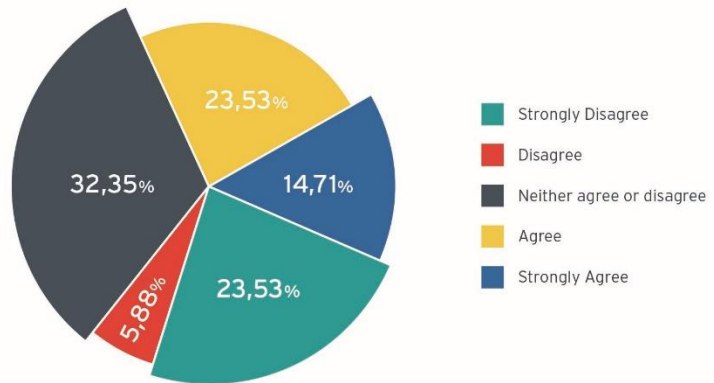
- I am afraid that my potential business idea will not be attractive in the market.



- The legal framework in my country does not support academics when they start entrepreneurial activities within Universities.



- The current situation of the COVID-19 pandemic.



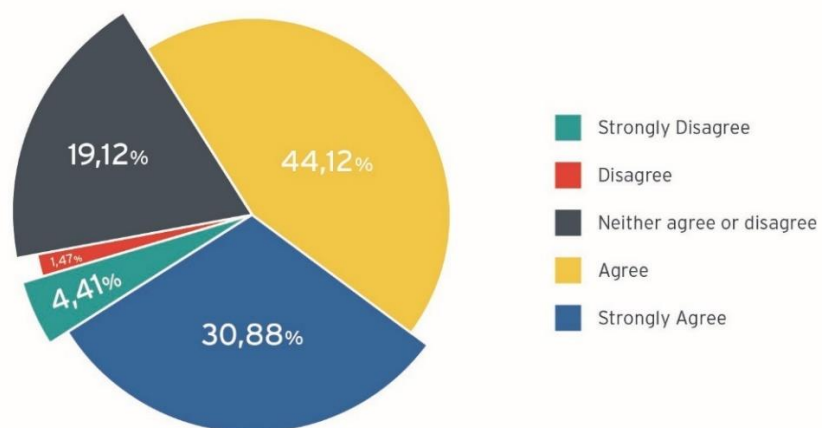
Considering the results coming from this part, the majority of the academics have considered to exploit a business idea in the past. The next question tried to identify possible challenges that academics have faced in their attempt to commercialise their idea or have held them back of initiating a business idea. Data showed that most of the universities provide a relevant office/department that support academics in developing entrepreneurial activities. However, the results coming from the two following questions investigating whether universities provide incentives and a particular policy for the relationship with business are mixed. Specifically, half of the universities promote researchers' and students' involvement in entrepreneurial activity, but the other half do not. Similar results come from the question which investigates whether universities provide a particular policy for university's relationship with business for which we do also report a significant number of academics who declared 'neither agree or disagree' (35,3%). In previous research, unclear university policy regarding the relationship with business found to be one of the constraints hold researchers and students back from establishing business enterprises and/or spin-offs (Binkauskas, 2012). Furthermore, mixed results were revealed considering whether academics' work is more theoretical and potentially not relevant with entrepreneurial activities. This may be attributed to the wide range of participants' disciplines (e.g., Education, Computer Science, Engineering). Another important challenge that academics face is the possible legal complications that may arise in their attempt to start a spinoff and the problems that could occur with their

superiors. Additionally, we report that lack of time to embark in such exploitation/entrepreneurial activities is an important element that concern academics (almost 70%). One of the difficulties that may exist between the relationship of academics that aim to implement a business idea and university is the rights of intellectual property. Almost half of the respondents declared that they are aware of the Intellectual Property Rights associated with their invention or the procedure that they should follow to protect them. Despite the fact that academics are willing to commercialise their research work, half of the participants declared that they do not know how to start in exploiting their research findings or embarking on entrepreneurial activities, for example how to develop a business plan. Almost 42% of the participants are able to identify a business opportunity considering the needs of a particular target group and the characteristics of their business idea, however similar amount of the respondents declared their fear that the company will have no commercial success (see also Binkauskas, 2012).

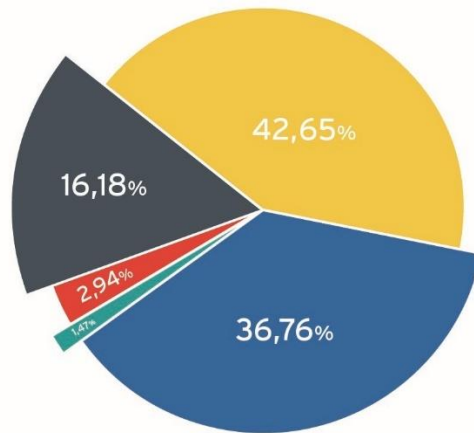
Part III: The development and implementation of an idea/activity

This part investigates particular entrepreneurial competences of non-business academics. The statements were adopted by the EntreComp framework and have been adjusted to the needs of ENTRANCE project.

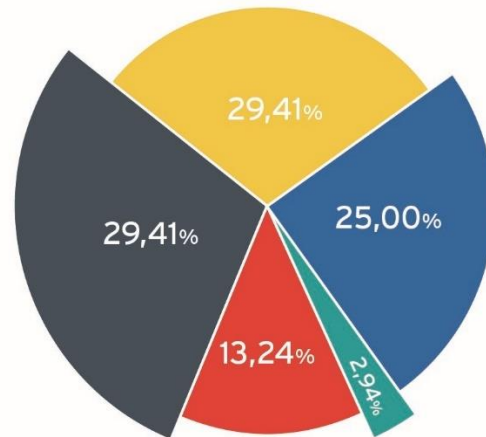
- I can recognise community's and surroundings' needs for the development of my business idea/initiative.



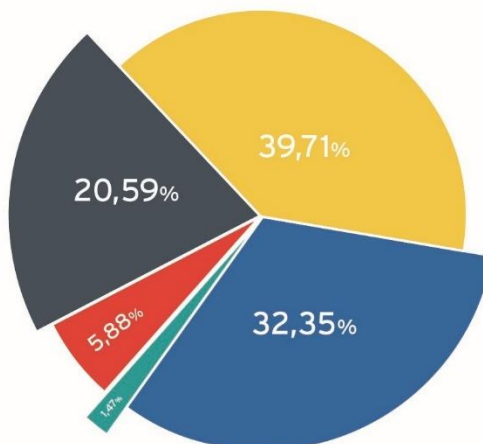
- I can identify innovative characteristics of my business idea/initiative.



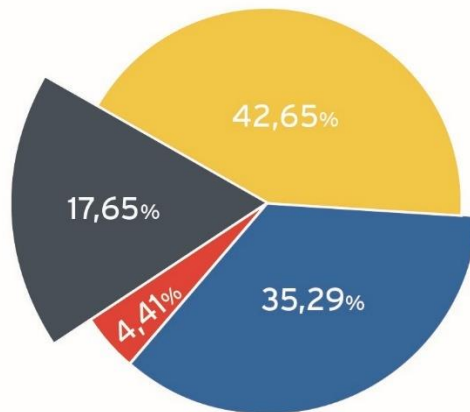
- I can choose the right resources for the implementation of my idea.



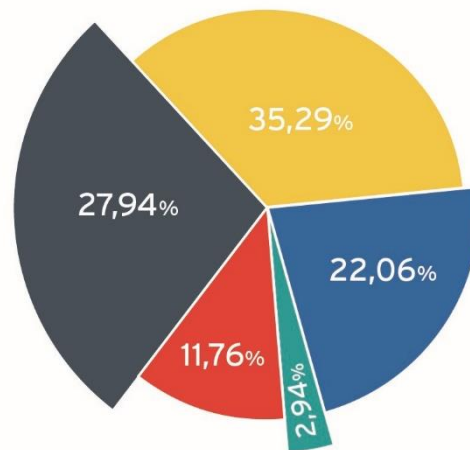
- I can identify my strengths and weaknesses and those of my team.



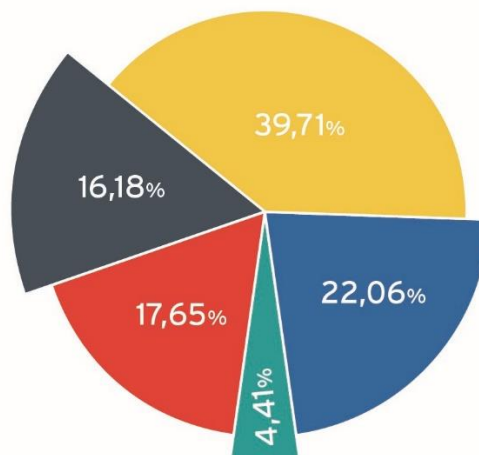
- I can keep my team motivated to what they want to achieve.



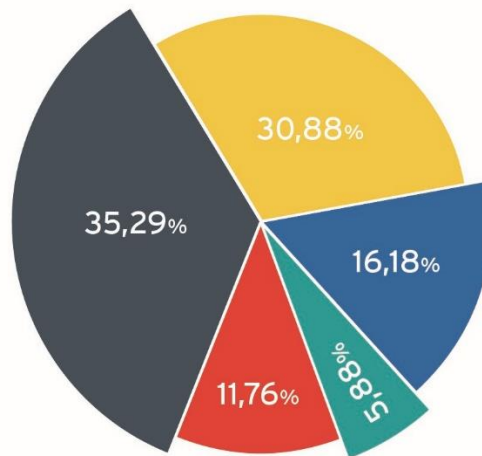
- I can look for external help if need be, for the development and implementation of my idea/activity (e.g., social enterprise advisors).



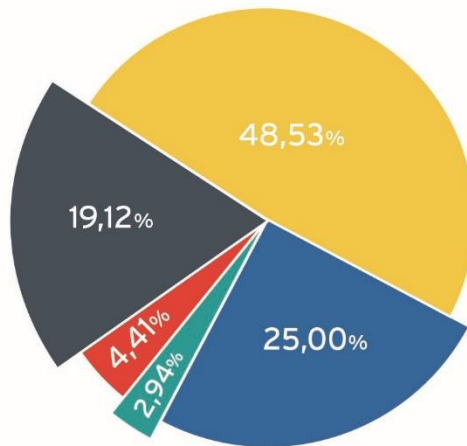
- I can draw up the budget of my idea/activity.



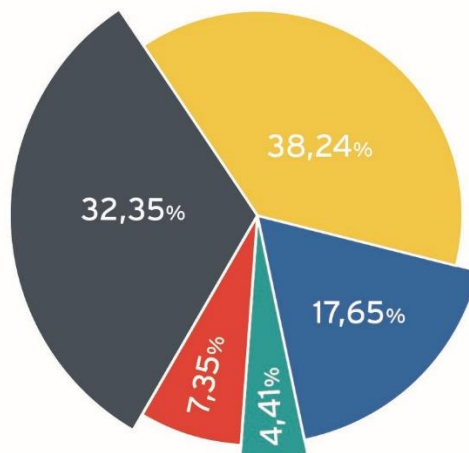
- I can use social media appropriately based on my audience and the purpose of my idea/activity.



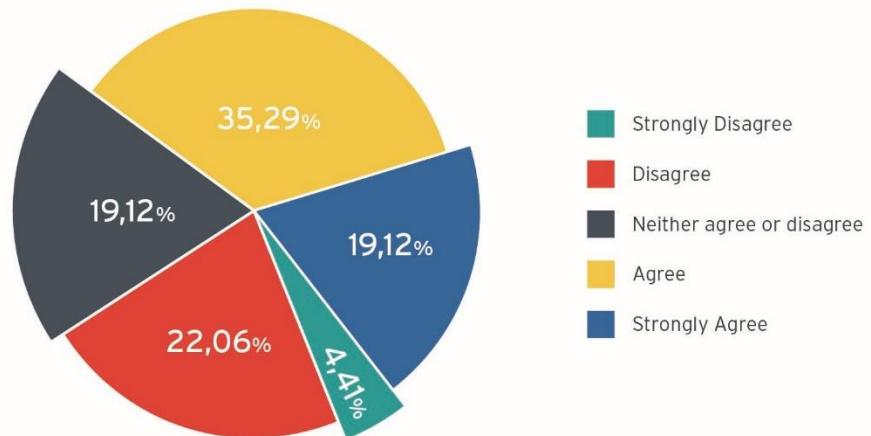
- I can develop an action plan which includes the basic steps to achieve the goals of my idea/activity (e.g., set milestones).



- I can recognise in advance possible risks related to my idea/activity.



- I can develop a business plan describing how to achieve the goals of my idea/activity.



The majority of the academics reported that they acquire essential competences for the development of an idea/activity. Specifically, we report that most of them indicated that they are capable of the recognition of community's and surroundings' needs while they can also identify characteristics of their idea/activity that promote innovation. Investigating their ability to use and allocate the resources needed for the implementation of their idea/activity, we report that a significant number of the respondents declared that they can choose the adequate resources for the development of their idea/activity, while 30% of them reported that they neither agree or disagree.

Furthermore, most of the respondents declared that they acquire important competences such as to identify their strengths and weaknesses and those of their team, they can keep their team motivated to what they want to achieve, they can look for external help if need be, for the development and implementation of their idea/activity, they can develop an action plan which includes the basic steps to achieve the goals of their idea/activity and they can even draw up the budget of their idea/activity. However, more than 30% of the respondents declared that they neither agree or disagree in the questions that investigate whether they can use social media appropriately based on their audience and the purpose of their idea/activity and whether they can recognise in advance possible risks related to their idea/activity.

Last but not least, the results coming from the last question which investigates whether academics are able to develop a business plan describing how to achieve the goals of their idea/activity are mixed with important variation among participating countries (e.g. only 1/19 reported 'strongly agree' in Cyprus).

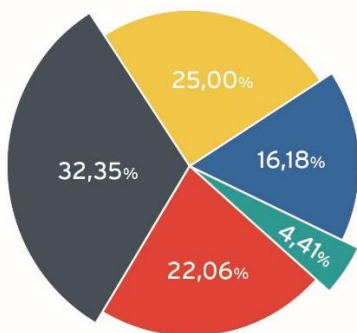


Considering the results of this part, we conclude that respondents acquire important entrepreneurial competences that support them in the development of an idea/activity, however their lack of how to commercialise their idea/activity using social media, identify in advance potential risks and develop a business plan was observed. This conclusion may be attributed to the fact that academics have a strong knowledge and experience of how to organise and run research projects, however they do not hold those competences that are important to launch a business.

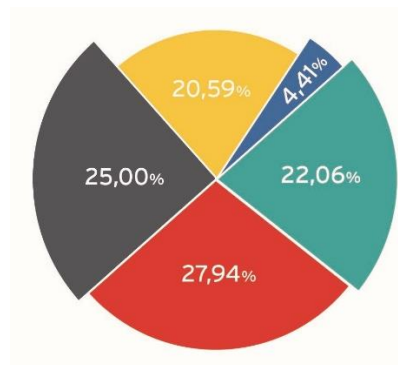
Part IV: Entrepreneurial environment and practices

1) How much do you agree with the following statements? Please, consider the attitude of your university as a whole towards entrepreneurship education.

One of the goals of the university is to stimulate and support the development of entrepreneurial mindsets and skills.

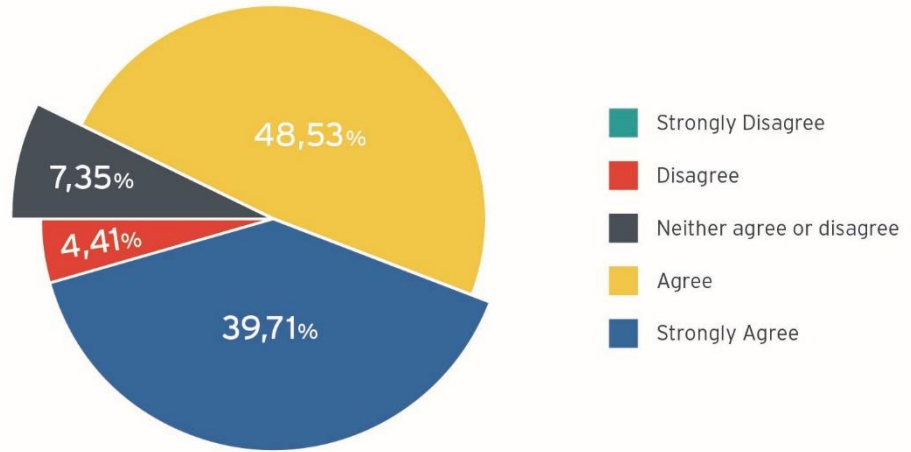


Academics and staff follow an entrepreneurial teaching approach across all the departments, promoting diversity and innovation in teaching and learning.

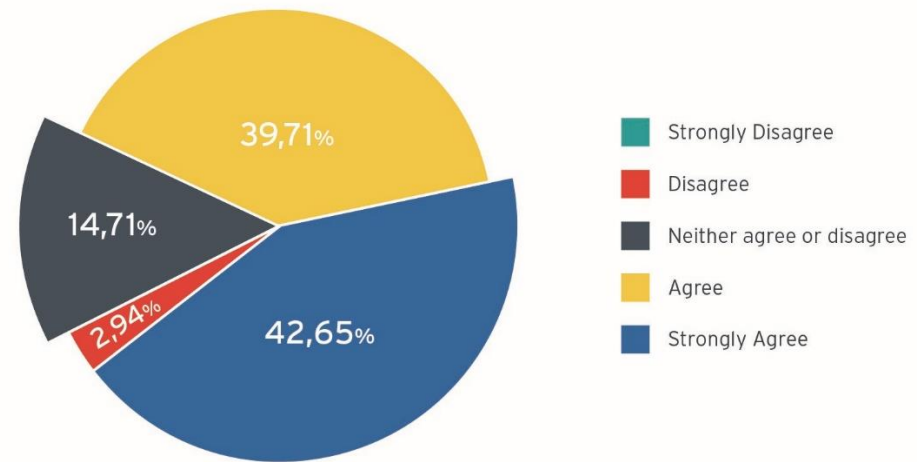


2) How important is for your teaching the use of the following pedagogical methods?

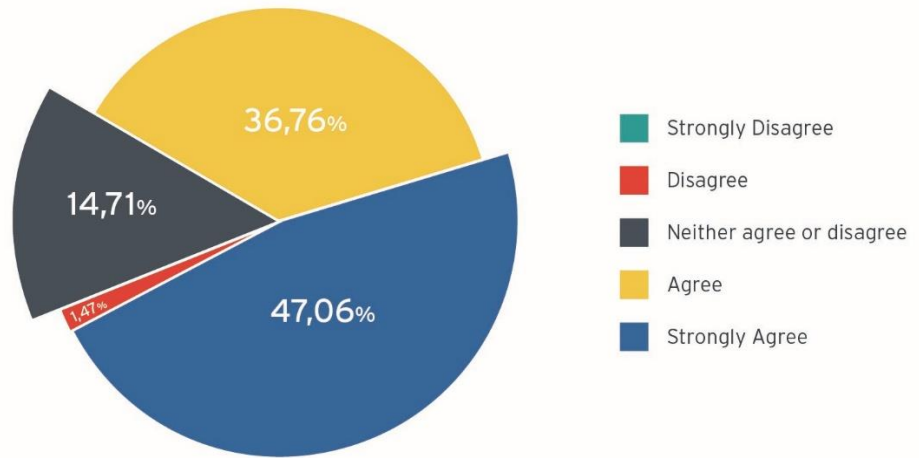
- Ask students to decide their own problem-solving procedures.



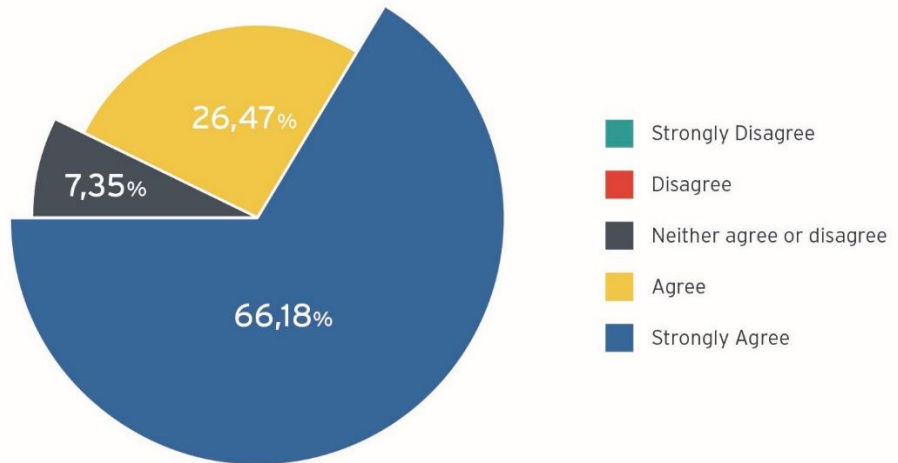
- Encourage academics and students' collaboration for common assignment.



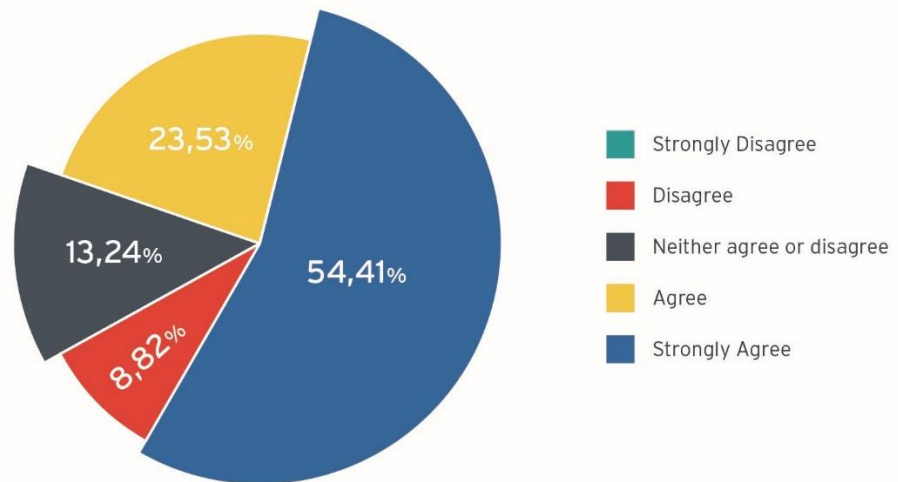
- Ask students to work and examine case studies.



- Engage students in real-world projects (e.g., problem-based learning).



- Use experiential learning approach (e.g., pop-up shops).



From the fourth part of the questionnaire we gathered information related to the pedagogical approaches academics use which facilitate entrepreneurial education. Furthermore, we asked them to consider the attitude of their universities as a whole towards entrepreneurship education. Considering the answers coming from this part, we conclude that the results are mixed. Almost 58% of the respondents (almost half of them chose neither agree or disagree) declared that their university does not stimulate and support the development of entrepreneurial mindsets and skills.

Furthermore only 4,41% declared that in their university, academics and staff follow an entrepreneurial teaching approach across all the departments, promoting diversity and innovation in teaching and learning. However, from the following questions which investigate particular pedagogical approaches that reinforce entrepreneurship education, we conclude that the results are contradictory,

A possible explanation of this result could be that individual academics integrate pedagogical approaches that support and reinforce the entrepreneurial mindset of students but probably there is not a particular common approach established by universities. Thus, ENTRANCE project aims to introduce academics from different disciplines to those pedagogical approaches through particular examples of activities that reinforce entrepreneurial mindset of their students. ENTRANCE MOOC will be freely accessible and the participants will be encouraged to promote the material and the courses to other academics.

Interviews – industry experts

An interview was carried out with 2 industry experts from each participant country, to identify the most important entrepreneurial competences and attitudes. The interviewees were academics with no background in business or entrepreneurship that made the jump into an entrepreneurial venture.

The aim was to understand the mindset and highlight the common skills interviewees needed to develop that contributed to their business' success, as well as to identify any common challenges they have faced considering their non-business academic background.

The interviews' analysis was developed under the templates provided by GrantXpert and they were finalized after the review of all project partners. The template that was followed can be found in Annex II. The gathered data was initially included into the National reports (Cyprus, Greece, Lithuania, Portugal). The interviews consisted of the following parts:

- Part I: Demographic characteristics/Professional & Educational Background
- Part II: Challenges and the role of universities
- Part III: Entrepreneurial skills

Part I: Demographic characteristics/Professional & Educational Background

In total 8 entrepreneurs with a non-business academic background were interviewed. All interviewees were males that developed startups in different fields, like biotech, architecture, digital transformation, healthtech, real estate, engineering, and others.

Part II: Challenges and the role of universities

Comparing the interviews of the industry experts certain challenges and issues commonly appear. Firstly, all interviewees have highlighted the importance of collaboration between HEIs and their academic staff and students in providing the necessary knowledge in innovation and entrepreneurial skills, as well as helping to commercialize any academic ideas and university-produced research.

Moreover, the need to acquire entrepreneurial skills and competences, in order to create and scale up a company was mentioned by all experts. Knowledge and skills like recognizing and exploiting the opportunity successfully, developing a business plan, financing, team building and leadership, time management, marketing, how to handle investors, legal and regulatory issues, were identified as aspects needing enhancement due to their non-business background. To develop their entrepreneurial mindset and skills experts mentioned attending extracurricular programs such as workshops, postgraduate degrees, online pitch trainings and business courses.

Regarding the challenges faced due to the health crisis since 2020, replies were split mainly because of the nature of each expert's business. Most challenges identified were disruptions in delivery of products and services from vendors, working conditions altered, as well as financial problems. Some interviewees mentioned that the digitization acceleration in business due to the pandemic affected them in positive ways.

Part III: Entrepreneurial skills

While discussing ideas and opportunities, almost all experts expressed the opinion that a product being useful is as important as its innovation, as this would ensure its sustainability. Additionally, regarding the most important component that drove their idea into action, the majority identified the people in their team. Diversity in expertise and background, positive attitudes and experiences, were noted as key elements to the innovation and growth of a business. Other resources mentioned for the development of the business were cashflow, funding, mentorship and feedback from the targeted community. To keep their team motivated the experts noted that maintaining healthy working conditions, close relationship between the leadership and the employees, communicating the leadership's vision clearly to employees and continuous training are all major factors.

Regarding digital resources utilized, all entrepreneurs discussed an array of software solutions that target their team's and product's needs, such as digital media solutions, CRM tools, marketing and emailing tools, all aiming to simplify and speed up processes while saving money.

Networking was also identified by all as crucial to the success of the entrepreneurial venture, as it results to customer confidence to the product and helps with the establishment of partnerships that in turn can drive the growth and profit of the company.

When discussing the key characteristics of a successful business plan, experts mentioned the importance of risk analysis, assessment analysis, analyzing the target market, financial projections and including an appropriate mix in funding structure. A business plan should be frequently modified, as the

business evolves. Several of the experts discussed the difficulty in determining all the risks involved and how foreseeing such risks may be a deterring factor for a venture to proceed. It was also noted that a business plan that an entrepreneur should seek training in business plan development, as this can prevent potential risks and organize

Conclusions

The current study is a quantitative and qualitative analysis of the collected data across the four participating countries in ENTRANCE project. The aim of the report is to provide a comprehensive overview of the state of the art across the involved countries. This document was developed based on the national reports from each partner country where the results from each country are presented in detail. The sample of this study was 68 non-business academics coming from a range of academic disciplines such as Education, Life Sciences, Art & Humanities, Engineering. This analysis addressed the following topics:

- The attention of Entrepreneurship Education from non-business oriented academics in Europe.
- The collection of national and international programs that foster Entrepreneurial Education across the involved countries which were identified through a desk-based research.
- The relationship of academics' universities with entrepreneurship and their experience related to entrepreneurship.
- The entrepreneurial competences of the participated academics.
- The pedagogical practices that promote Entrepreneurial Education.

Based on our results, the following conclusions are highlighted. First, universities have managed to build rapport with the industry as the majority collaborate with local firms and most of them offer funding opportunities to academics. Although, this could be characterized as a supportive environment for academics who want to develop their business idea, we identified some challenges which may have held them back of initiating a business idea. Among those challenges, the most important are: the unclear university policy regarding the relationship between universities with business; the possible legal complications that may arise in academics' attempt to start a spin-off and the problems that could occur with their superiors; the lack of time to embark in such exploitation/entrepreneurial activities; the unawareness of the Intellectual Property Rights associated with their invention or the procedure that they should follow to protect them; and the fear that their company will have no commercial success.

Considering the entrepreneurial competences that academics acquire, we concluded that the majority of the academics acquire essential competences for the development of an idea/activity, however they lack of those competences that are important to launch a business such as the development of a business plan.

Furthermore, the majority of academics declared that in their universities, academics and staff do not follow an entrepreneurship teaching approach across all the departments. However, the participated academics use a number of practices that reinforce and support the entrepreneurial mindset of their students

such as asking students to decide their own problem-solving procedures; encouraging academics and students' collaboration for common assignments.

The 8 interviewees across the participating countries, highlighted also the importance of the relationship between universities and business industry in providing the necessary knowledge in innovation and entrepreneurial skills, as well as helping to commercialize any academic ideas and university-produced research. Furthermore, they highlighted those entrepreneurial competences which were emerged also through our primary research as important challenges and/or competences for the exploitation and development of a business idea, such as developing a business plan, financing, marketing, legal and regulatory issues. Other important entrepreneurial skills that they mentioned are the networking, the identification of innovative characteristics of a product and the utilization of digital resources as some of them mentioned that the digitization acceleration in business due to the COVID-19 pandemic affected them in positive ways.

After reviewing the findings from our research, ENTRANCE project aims to build a training program according to the needs detected by improving academics' core entrepreneurial competences leading to successful start-ups or spin-offs and by equipping them with those pedagogical approaches that reinforce the entrepreneurial mindset of their students and can be used in any academic discipline.

Appendix I

NATIONAL PROGRAMMES

Title	Duration	Aims	Participating countries	Practices	Outcomes	Website
IDEA Business Creation Training Program	2015-...	Offering start-ups the entire spectrum of business support to entrepreneurs from idea-stage to the stage of sales & investment and to the stage of scaling up and expanding abroad.	Cyprus	High quality of training, workshops, mentoring, consultation, complimentary office space, field trips, networking, business development opportunities, connection with investors, media exposure, seed funding and free professional services.	Creation of 70 new business, 80+ new job positions and has supported 160+ entrepreneurs over the past 5 years.	https://ideacy.net/training/
Cyprus Seeds for technological innovation	2018-...	Empower Cyprus' most talented academic researchers to make a difference in the world by developing innovative technologies in the lab and bringing them to the marketplace in the form of breakthrough products and new companies.	Cyprus	Offers grants, Practical Training, Mentoring, Networking.	E.g., Supporting 12 academic research teams, Grantees from all the Universities and Research Institutions, 10 new hires of researchers	http://www.cyprusseeds.com/

Performance Enterprise Accelerator & Knowledge	2018-...	Aims to research, support and accelerate efforts of Entrepreneurship	Cyprus	-BootCamp for Young Entrepreneurs workshop and competition Connection Cyprus -Startup Bootcamp for Young Entrepreneurs workshop	-Counselling & mentoring to university students and young entrepreneurs that are seeking to create innovative products / services as well as their teachers / academics. -Cultivating entrepreneurship among teenagers and students while reinforcing the development of entrepreneurial skills to teachers and academics	https://euc-peak.eu.c.ac.cy/about-euc-peak/
ACEin Unit (Athens Center For Entrepreneurship And Innovation)	2016-...	Supporting new business schemes and research teams in the development and implementation of their innovative business ideas.	Greece	Helps the beneficial business groups to develop the ideas and move from the idea stage to the business implementation stage, while increasing the chances of success through continuous interaction with the market.	-Support more than 200 teams and has organized over 50 actions and specialized programs to support entrepreneurship. -A leading role in the business exploitation of research results.	https://acein.aueb.gr/
Training programme “Ideas to Innovation (i2i)	2020	Encourages research master and Phd students to consider the social and economic relevance of their research” (Cranfield.ac.uk , 2021). i2i programme enables participants to explore entrepreneurship as	Lithuania	The programme delivers a training following an experiential learning approach and emphasizing on three elements: - Team work & networking capabilities	Has inspired more than 1,500 participants to successfully develop and commercialise their ideas and has led from idea to solution such projects as Data Solver and Corrosion Radar.	http://www.kee-network.com/

an option for company innovation and new venture creation, gain basic business understanding; develop knowledge of how to commercialise their research, and develop a network of likeminded researchers facing similar challenges.

- Facilitators
- Digital tools

<p>Business pre-acceleration program EVOLUT 4.0</p>	<p>2018</p>	<p>Is designed for early stage startups to develop an innovative product, increase sales and prepare for investment phase.</p>	<p>Lithuania</p>	<ul style="list-style-type: none"> - Teams find a product-market fit with a modified product development model or by meeting consumers and asking what they need -Lectures and online training sessions -Meetings and first presentations to investors (Pitch Deck presentations) 	<p>At least ten startups per one programme have been accelerated. Already 20 alumnie/succesful startups.</p>	<p>https://kaunomtp.lt/evolut</p>
<p>Start-Up Programme</p>	<p>2015-2016</p>	<p>The programme helps students to understand better how to create and manage a company, providing university students with entrepreneurial training. Through the organization and</p>	<p>Portugal</p>	<p>Emphasis on:</p> <ul style="list-style-type: none"> -communication -decision-making -negotiating 	<p>A more global view of the range of professional possibilities, prepare for entry to the labour market and develop and put business ideas into practice.</p>	<p>http://www.japortugal.org/educacao/ensino</p>

operation of a fictitious business but operating as if it were real, students learn about the structure of the business system and its benefits.

-organisation and time management competences.

[universit.rio/906-start-up-programme.html](https://www.universit.rio/906-start-up-programme.html)

<p>Business Ignition Programme</p>	<p>2020</p>	<p>Aims to identify market opportunities, respond to challenges/needs, create business opportunities in the area of technology and provide participants with skills in the valorisation and commercialization of technology</p>	<p>Portugal</p>	<p>-Support and follow-up by consultants and experts from U.Porto Innovation and a training partner</p> <p>-Immersive sessions in technology commercialisation, customer knowledge, start-up development and business modelling</p> <p>-Meetings with selected mentors, who will follow the evolution of teams and facilitate the validation of business models.</p>	<p>Identify market opportunities for potential products/services resulted from research;</p> <p>Respond to challenges/needs/problems presented by companies;</p> <p>Provide participants with the skills necessary for the valorization and commercialization of technologies;</p> <p>Creation of new technology-based business opportunities.</p>	<p>https://bi.p.up.pt/business-ignition-programme/</p>
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Appendix II

INTERNATIONAL PROGRAMMES

Title	Duration	Aims	Practices	Outcomes	Website
E-mindS- Development of an Entrepreneurial MindSet In Higher Education'	2018-2020	The programme uses student centered innovative approaches to develop Higher Education and VET students' entrepreneurial mindset based on the EntreComp competence	<ul style="list-style-type: none"> -Educational Material for Learning Groups through Actions-VET - Educational Material for Learning Groups through Actions-Higher Education -Assessment Tool-Higher Education 	Develop the skills of the European EntreComp Skills Business Framework through the development and piloting of student-centered approaches	https://e-minds.eu/el/%CE%B1%CF%81%CF%87%CE%B9%CE%BA%CE%B7/
ICT ENTREPRENEUR	2014-2017	An EU-funded project which aims to develop an innovative training package that will help ICT students and graduates to enhance their entrepreneurial skills and put their knowledge into practice.	<p>The development of an ICT Entrepreneur Training programme including:</p> <ul style="list-style-type: none"> -in-class lectures -role plays -practical exercises and games -visits to companies -guest speakers' lectures <p>It developed also:</p>	<ul style="list-style-type: none"> -Development of entrepreneurial skills to 100 ICT students/graduates across Europe. -Assistance to these young people in starting their own companies. -Offering a new training course in the form of a pre-accelerator programme for entry in accelerators, incubators, universities, etc. -Serving as a best-practice example and a training model for strategic partnerships and other EU initiatives within the entrepreneurship area. 	https://grantxpert.wixsite.com/ict-entrepreneur

-train the trainers' handbook
including case studies and success
stories

**entreTime: Creation
and Implementation
of a Train-the-
Trainer Programme**

2020-2022

Aims at upskilling
educators within Higher
Education Institutions and
upgrading their pedagogical
tools on this domain by
providing a comprehensive
training package. The
primary target group of the
project is non-business
Academics who have an
interest in embedding
objectives and practical
aims of entrepreneurship
education into their
syllabus.

The EntreComp framework is used
to improve skills and expertise such
as problem-solving, human
empathy, teamwork,
communication, self-efficacy,
adaptability, attentiveness, tenacity,
and resilience via the use of
experiential learning

The gradual effectiveness increase of
national development strategy, priority
fulfilment, as well as change the graduate
entrepreneurship and employment situation.

<https://acein.aueb.gr/european-initiatives/>

**CEBT Ibérico
(Technology-based
Entrepreneurial
Course)**

2018

Aims to invert the logic of
supported training for
advanced consultancy, in
value creation and
Technology-Based Firms
(TBFs), using the wide
experience of specialists,

-Four themed workshops led by
academics (Market Study, Business
Models, Strategy and Marketing,
Communication and Negotiating)

-Four mentoring sessions led by
consultants, one coaching session

The programme has originated in some
start-ups of reference in the region and in
Portugal and also given STEM students a
perspective of entrepreneurship.

Allowed non-business students to gain skills
and business literacy;

<http://wordpress.ubi.pt/cebt/>

		through close accompaniment of multi-disciplinary teams, being led by academics and consultants.	-A final joint event to present the business ideas	They learned methods of developing business models; Learned to evaluate their business ideas; Allowed to increase the entrepreneurial intention; Networking.
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**SCIENT
(SCIENTists'
ENTrepreneurial
spirit)**

2017

Make doctoral students and graduates aware of their career options and aware about the possibility of using their research findings and starting their own company.

Draw an entrepreneurship training program directed to teachers, researchers and PhD students.
Support students to develop their business idea using a lean start-up approach

Course directed to trainers
Course directed to PhD students/ young scientists
Final event with the teams from all countries involved in the consortium. This event aimed to reward the best business idea.

[HOME - SCIENT | European University - Business Alliance \(euscient.eu\)](#)

Appendix III

Questionnaire

Part I: The relationship of your university with entrepreneurship

1. Does your university collaborate with local firms (e.g., SMEs, large corporations, start-ups) for the promotion of entrepreneurship culture within the university?
 - ✓ Yes
 - ✓ No
2. Does your university provide to its academics/researchers the opportunity to receive research or innovation funding for the development and exploitation of a business idea?
 - ✓ Yes
 - ✓ No
3. Is there a relevant office or department within your university that supports academics or students in developing entrepreneurial activities?
 - ✓ Yes
 - ✓ No

Part II: Your experience in relation to entrepreneurship

1. Do you have any relevant experience in the development and the exploitation of a business idea?
 - ✓ Yes
 - ✓ No

Which are the challenges you have faced (or continue to face) or have held you back, even if you do not have any experience in the development and the exploitation of a business idea? (If you have never considered any challenges/difficulties, please skip this part).

- ✓ I never thought to develop and exploit any business idea until now.
- ✓ My university does not provide any incentives for academics to develop entrepreneurial activities.
- ✓ There is no clear university policy regarding relationship with business.
- ✓ My university does not have a relevant office/department that supports academic in developing entrepreneurial activities.
- ✓ My research work is more theoretical, it is not so relevant with entrepreneurial activities.
- ✓ My colleagues at university are not willing to start working on this new business idea together so I face difficulties in forming a successful team.
- ✓ There are many legal complications between the university and the academics when they start a spin-off and I do not want to get into arguments with my superiors.

- ✓ I am not aware of the Intellectual Property Rights associated with my invention or the procedure that I should follow to protect them.
- ✓ I work so many hours to conduct other academic tasks that I don't have time to embark in such exploitation/entrepreneurial activities.
- ✓ I do not hold a previous experience of how to start in exploiting my research findings or embarking on entrepreneurial activities (e.g., development of a business plan).
- ✓ I am not sure how to identify a business opportunity considering the needs of a particular target group and the characteristics of my business idea.
- ✓ I am afraid that I won't be successful in my entrepreneurial efforts since I was not trained in this area before thus I avoid starting altogether.
- ✓ I am afraid that my potential business idea will not be attractive in the market.
- ✓ The legal framework in my country does not support academics when they start entrepreneurial activities within Universities, it supports the university to a greatest extent.
- ✓ The current situation of the COVID-19 pandemic.

Other (please write your own reasons)

(ranking from 1 to 5, 1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree)

Part III: The development and implementation of an idea/activity

(*Note: Please consider that for the needs of this questionnaire we define the word idea/activity as an action that you initiated related to your work or you participated in such an action for which you were responsible for its development and implementation. For example, this could be a research project or any other project that took place in your university but also outside of it for a short or long time period).

1. I can recognise community's and surroundings' needs for the development of my idea/activity.
2. I can identify innovative characteristics of my idea/activity.
3. I can choose the right resources for the implementation of my idea.
4. I can identify my strengths and weaknesses and those of my team.
5. I can keep my team motivated to what they want to achieve.
6. I can look for external help if need be, for the development and implementation of my idea/activity (e.g., social enterprise advisors).
7. I can draw up the budget of my idea/activity.
8. I can use social media appropriately based on my audience and the purpose of my idea/activity.

9. I can develop an action plan which includes the basic steps to achieve the goals of my idea/activity (e.g., set milestones).
10. I can recognise in advance possible risks related to my idea/activity.
11. I can develop a business plan describing how to achieve the goals of my idea/activity.

(ranking from 1 to 5, 1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree)

Part IV: Entrepreneurial environment and practices

1. How much do you agree with the following statements? Please consider the attitude of your university as a whole towards entrepreneurship education.
 - i. One of the goals of the university is to stimulate and support the development of entrepreneurial mindsets and skills.
 - ii. Academics and staff follow an entrepreneurial teaching approach across all the departments, promoting diversity and innovation in teaching and learning.

(ranking from 1 to 5, 1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree)

2. How important is for your teaching the use of the following pedagogical methods?
 - i. Ask students to decide their own problem-solving procedures.
 - ii. Encourage academics and students' collaboration for common assignment.
 - iii. Ask students to work and examine case studies.
 - iv. Engage students in real-world projects (e.g., problem-based learning).
 - v. Use experiential learning approach (e.g., organise students' visits in local firms as an objective of your class, pop-up shops).

(ranking from 1 to 5, 1=Unimportant, 2=Slightly important, 3=Moderately important, 4=Important, 5=Very important).

Part V: Demographic characteristics

1. What is your gender?
 - a. Male
 - b. Female
 - c. Non-binary/third gender
 - d. None of the above apply to me
 - e. Prefer not to disclose

2. How old are you?

(Age: 20-25, 26-30, 31-40, 41-50, 51-60, 61 or older)

3. By the end of this academic year, how many years will you have been teaching altogether?

(Years: less than a year, 1-5 years, 6-10 years, 11-20 years, 21-30 years, 31 or more years)

4. In which institution/university are you employed?

5. What is your area of specialisation?

- Arts and Humanities
- Clinical and Health
- Education
- Law
- Life sciences
- Physical sciences
- Psychology

Other:

6. Which is the exact position you hold in the organisation/university?

- Professor
- Associate Professor
- Assistant Professor
- Lecturer
- Researcher

Other:

Would you like to participate in the free online training of entrepreneurship addressed to non-business academics during 2021-2022 offered by the "ENTRANCE" EU-funded project?

- a) Yes
- b) No
- c) Not sure

Please indicate which of the following criteria would influence your decision on whether you would participate in the training or not:

- a) Duration/time slots of training
- b) Training design
- c) Course material to meet my needs
- d) Flexibility on the delivery of the assignments and participation in the training
- e) Sufficient feedback and suggestions from the trainers
- f) Time needed to invest in this

Other:

Appendix IV

Interview

Part I: Demographic characteristics/Professional & Educational Background

1. Name:
2. Interviewee work position:
3. Date of interview:
4. Educational Background:
5. Professional background:
6. Years of experience in business:

Part II: Challenges and the role of universities

1. Tell us a bit about the business you developed. When did your entrepreneurial journey begun? How was this journey so far for you?
2. Can you describe any challenges you have faced during the development of your business idea considering your non-business academic background? Would you characterize it as an important limitation?
 - How did you overcome this difficulty? (e.g., participated in seminars, classes, Master degree in Entrepreneurship or Management, coaching, mentoring, etc.)
3. Can you describe any challenges your business faced due to the current situation of COVID-19 (e.g., in lock-down mode, keep existing customers, technology, cash-flow problems, not able to launch a new product or service)?
4. Which was your incentive to leave academia (or to stay in academia but also run your business) and develop your own business idea?
5. What kind of relationship should be existing between universities and research with the business industry (e.g., commercialization of research)? What can they gain from one another?
6. Do you think that it is important university students coming from any academic discipline to cultivate their entrepreneurial mindset earlier in life? If yes, why?

7. What would you suggest to students that are thinking to start in the near future their own business and do not have a degree in business or in any other relevant sector?

Part III: Entrepreneurial skills

Ideas & Opportunities

1. Please explain the rationale of your business idea. What elements did you consider for the identification of your business idea/opportunity?
2. What is more important to you: the novelty of a product/idea or its meaning?
3. Does your idea hold innovative characteristics and why (competitive advantage, competitors respond)? Can this advantage be sustained and how?

Resources

4. Which are those resources (tangible and/or intangible) which helped to turn your idea into action? (e.g., follow strategies, reward, time management, funding, social media).
5. Do you use digital resources? Why do you consider technology as an important element for your business idea? For which tasks do you use digital resources (mention some software)?
6. How important are the people that will shape your team?
7. How do you keep yourself and your team motivated? Also, how important is the communication between you and the stakeholders, what type of leadership do you follow for this scope, or negotiation skills?
8. Do you consider networking an important element for your business and why? Which method do you use for the expansion of your networking?

Into Action

9. Which are the most important characteristics for the development of a successful business plan (e.g. sustainable business plan)?
10. Is it important to identify from the beginning of your project any possible risks that may arise during the implementation of your idea? How do you deal with these possible risks in advance?
11. How important is for you the growth of your business (sustainable growth)? How could you describe a growth mindset?
12. Do you believe that the diversity of your stakeholders (skills, attitudes) could be valuable for your company and how do you take advantage of it? How do you deal with yours and the stakeholder possible weaknesses?

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