CDT MOOC

Intellectual Output 1
EVIDENCE GATHERING REPORT

Erasmus+

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Contents

Foreword

This report presents the findings from national interviews conducted in all partner countries in 2020, relating to entrepreneurial education and university-business collaboration and operated with entrepreneurs and SME representatives, teachers and students. The focus of the research is on identifying the elements influencing entrepreneurship and innovation education.

A new wave of economic development is sweeping the world, with entrepreneurship and innovation as the primary catalyst

> ---Morris, Kuratko and Cornwall (2013).

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Acronyms

CPS   Creative Problem Solving

DT   Design Thinking

EU   European Union

HEI   Higher Education Institution

ICT   Information and Communication Technology

IO   Intellectual Output

MOOC   Massive Online Open Course

MSS   Miðstöð símenntunar á Suðurensjum training centre

SG   Serious Game

SMEs   Small and Medium Enterprises

UBC   University Business Collaboration

UTU   University of Turku

UX   User Experience

VET   Vocational Education and Training

I.   Background and overview of the report

CDTMOOC project promotes open education and innovative practices in the digital age through an interactive and gamified MOOC and digital guides describing innovative methodologies for their applicability in everyday practice.

The project aims at disrupting the learning environment through innovative pedagogies. In fact, the project is about using different methodologies such as Creative Problem Solving, Design Thinking and Human-Centred Design to support modern entrepreneurship, to stimulate a change in practice, and after having proven itself during a period of intensive Pilot Testing.

In the context of Intellectual Output 1 "Evidence Gathering Report", a multi-level research was carried out as follows:

- Desk research for capturing the state of the art of higher education related to the existing **entrepreneurship education and learning** in Europe
- Focus group interviews in the five EU partnering countries – Finland, Italy, France, Luxembourg and Iceland. The partners carried out a research using guided interview questionnaires involving a target group including lecturers, students and entrepreneurs. Each partner organization provided a report of their findings on entrepreneurship education. Five reports were gathered. UTU formulated the methodology for the research and analysed its results. The research took place between December 2019 and May 2020

During the field research, partners used a standardized guided interview questionnaire, including open ended questions. The guided questionnaire can be found in Annex 1.

II. Definition of entrepreneurship and entrepreneurship education

It seems important to start the report by first defining the concepts approached within the project and this analysis:

Entrepreneurship can be defined as "any attempt at new venture or new business creation, such as self-employment, a new business organization or the expansion of an existing business, by an individual, a team of individuals, or an established business"[1].

The goal of **entrepreneurship education** is to develop an entrepreneurial mind-set, that is, a set of attitudes, skills, and behaviours to discover entrepreneurship opportunities, access resources, and create value amidst uncertainty[2].
But entrepreneurship is much more than just starting a new venture. It also encourages a mind-set focusing on seeking opportunities, taking risks, resilience, creatively leverage resources and push an idea to implementation[3]. It is about creating new opportunities and executing new concepts in uncertainty and unknowable environment[4]. Around the world, entrepreneurship related courses are provided by over 3.000 colleges and universities[5]. Large number of universities provide minor, major, certificates, Master's degrees and Ph.D. programmes in entrepreneurship. It seems that the pace towards entrepreneurship education is accelerating and efforts have spread to reach faculties, students and administration across the university campus. According to Kuratko (2015), entrepreneurship is a rather new academic subject and is about continual innovation and creativity.

Gamification refers to the process of game-thinking and to the use of gameplay mechanics for nongame applications. It enables learning by doing[6] and includes game design dynamics[7], mechanics[8], and elements[9] [10], which are incorporated in tasks for various purposes, noticeably for engaging and motivating learners to acquire new skills or change behaviours[11] as well as for problem solving[12]. Millennials are tech savvy and generally avid users of interactive media and online video

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[1] Reynolds, P. D., Hay, M., & Camp, S. M. (1999). Global Entrepreneurship Monitor: Executive Report. Kaufman Centre for Entrepreneurial Leadership, 3.
[2] Davis, Hall & Mayer, 2016; McGrath & MacMillan, 2000

[3] Kuratko, D.F., Morris, M. H. Examining the future trajectory of entrepreneurship. Journal of Small Business Management (2018) 56 (1), pp. 11-23
[4] Neck and Green 2011
[5] Kuratko 2017
[6] A. I. Diane. Gamification of Entrepreneurship Education. Teaching Brief. Decision Sciences Journal of Innovative Education, Volume 18 Number 2, April 2020
[7] Emotions, Narrative, Constraints, Progression, Relations
[8] Challenging, competing, cooperating, playing in turns, rewarding, providing feedback, relying on chance, acquiring resources, making transactions, reaching win / loss states
[9] Achievements, Avatars, Badges, "Boss fights", Collections, Combat, Content Unlocking, Gifting, Leader boards, Levels, Performance Graphs, Points, Quests, Social Graph, Teams, Time, Virtual Goods
[10] Deterding et al., 2011; Seaborn & Fels, 2015
[11] Deterding, 2012
[12] Zichermann and Cunningham, 2011, p. 14

games[13]; therefore, they are more receptive to the use of gamification in class and might even expect or demand the use of sophisticated simulations to boost their learning interests and activities[14].

Creative problem solving (CPS) steps and operations can be grouped into three categories: 1) understanding the problem, 2) gathering information to generate new ideas and solve the problem and finally 3) preparing for action and executing.

Design thinking (DT) is based on a multidisciplinary, human-centred approach that combines abductive thinking, oscillating between analytical and creative modes of reasoning[15]. DT has recently been used as a collaborative problem-solving tool, as design is acknowledged as a strategic resource[16]. It involves creative tools such as storytelling, prototyping and iterative experimentation.

University-Business-Collaboration (UBC) is usually related to research (technology transfer and innovation), to teaching (lifelong learning/continuing education), or to social/cultural engagement in line with regional development goals. Additionally, this variety of activities comprises different types of actors, many constituent parts of universities and requires different structures and mechanisms for it to become a reality[17].

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[13] Hanus & Fox, 2015

[14] El-Masri, Tarhini, Hassouna, & Elyas, 2015

[15] Liedtka, 2015; Martin, 2009

[16] Carlgren, Elmquist et al., 2016

[17] U3M-AL project, Deliverable 1.1. Good practices of 3M in EU universities, Final report, February 2013

III. Purpose and scope of the evidence gathering report

The purpose of this report is to **identify the real needs and challenges in terms of education and learning in entrepreneurship and innovation** at each partner country: Finland, France, Iceland, Italy and Luxembourg.

The research questions are:

- What are the needs in terms of entrepreneurship and innovation education?
- How entrepreneurship and innovation education can be developed for higher education institutions and start-ups in the context of digitalisation?

The research examines the perspectives of the main educational actors: the students, the teachers and the industry (in this case entrepreneurs and SMEs' directors).

The investigation intends to understand which skills are seen as the most important to become entrepreneur, as well as how the education providers are collaborating with the start-ups and SMEs to ensure the relevancy of education. A special attention is put on the perspective of the students and analyses their perception of entrepreneurship education and innovation within their studies, as well as their intention to consider entrepreneurship as a career option; compared with the viewpoint of the teachers.

This way, the analysis will identify if entrepreneurship education provided by the teachers matches with the needs of the students and the expectations of the industry. Attention will be paid to the future of entrepreneurship education from the point of view of the three groups.

IV. Methods

The method used for this research is based on focus group interviews and individual interviews with the representative stakeholders of the learning triangle:

- • Academics, professors and lecturers
- • SMEs and entrepreneurs, and
- • students mainly from higher education institutions but also from Vocational Education and Training Institutions.
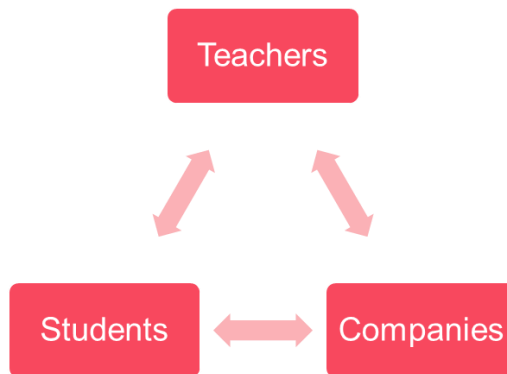
For this research have been interviewed: 31 entrepreneurs, 38 students and 32 teachers, in total 101 external stakeholders.
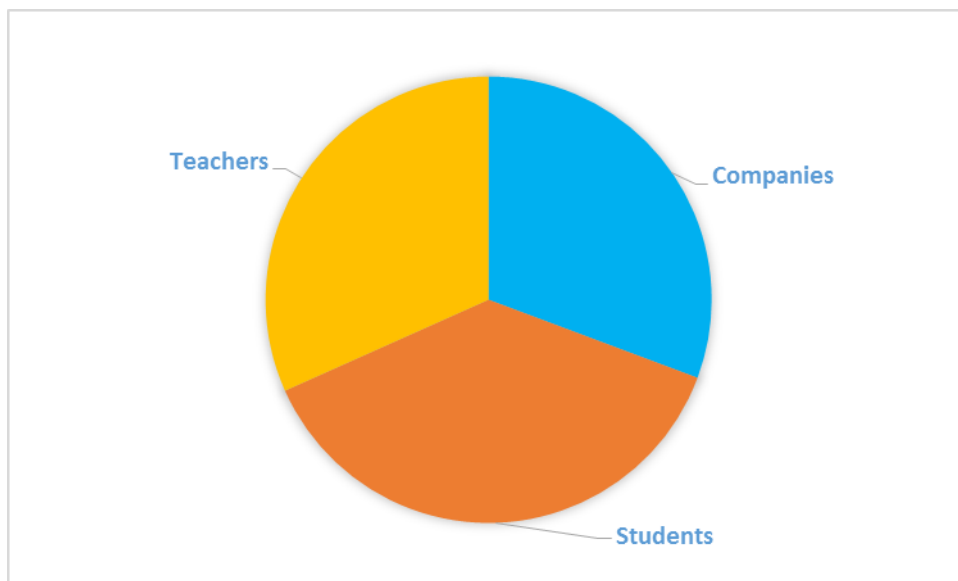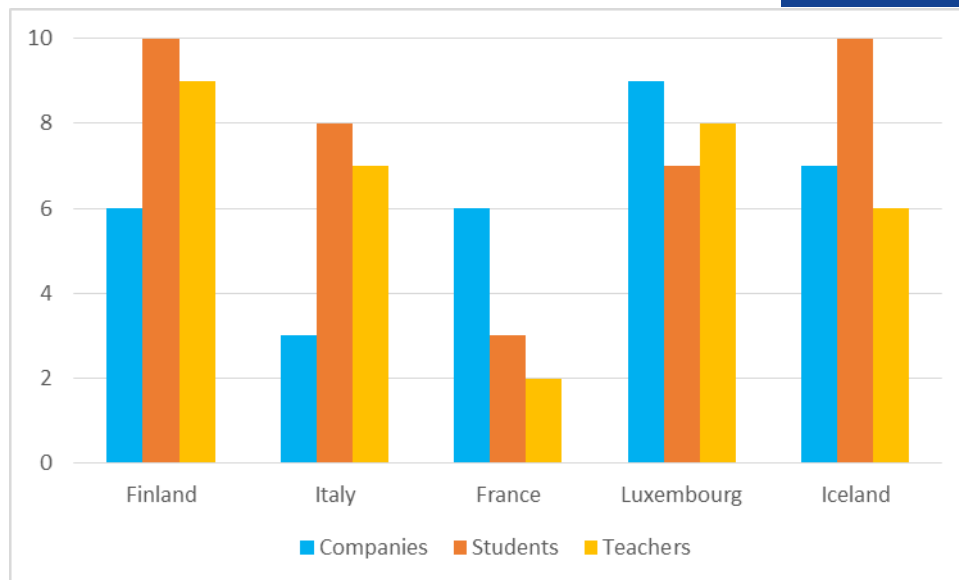
The research took place between November 2019 and June 2020. The research method used was a semi-structured focus group interviews. The leader of this work package, the University of Turku, prepared a set of question for each target group (see Annex 1). The questions were used to guide and focus the interviews but discussion were allowed to follow its path. The interviews were mainly held in the partners' premises. The participants were selected based on convenience sampling which was guided by availability and need to have different profiles: fields of business, age, gender, ethnic background, etc. Most of the research has been conducted face-to-face but due to COVID-19 it became difficult to reach participants and in order to collect the remaining data phone interviews and online surveys were used.

The graphics presented within the report are without a scale. The results were analysed qualitatively and the numbers collected do not represent the number of answers but rather how important were the statements collected from each project partner. Qualitative research allows us to collect insights on behaviour and motivations to understand reasons and underlying causes.

Entrepreneurship is everywhere. Within the past 40 years, academic programmes, academic research, student communities, teaching pedagogy, have been widely implemented and developed, and entrepreneurship has become relevant to our society. Entrepreneurship is much more than starting a venture. It gives a certain mind-set to seek opportunities, take risks and be resilient. But as the field of entrepreneurship widens, should we consider what the future of entrepreneurship education might look like? And that leads us to also consider why is entrepreneurship taught? What is the content of entrepreneurship education? And how is it taught?

According to the Journal of Small Business Management 2018 and their edition "Examining the Future of Trajectory of Entrepreneurship", entrepreneurship education is taught in universities for various reasons. Some are more aspiring to value creation while others consider the dynamism of the process requiring passion and energy towards the creation and implementation of innovative ideas[18]. The content varies between three variables, often combined, and focusing on 1) business

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[18] Kuratko 2017

basics in a new venture management context, 2) core entrepreneurial content, and 3) entrepreneurial mind-set. As for the mechanism to deliver content, it is often conveyed through conventional lectures, flipped classroom, online platforms, etc. But the future of entrepreneurship education also depends on the learning process itself and its experimentation, which depends more largely on the future of education in general.

That brings us to the future of entrepreneurship education. Entrepreneurship education might be dispersed into other disciplines and somewhat disappear, or not be as apparent as it is today and taught as separate major and minor subjects. Entrepreneurship might mature and take a more theoretical approach and by consequence take a step further from practice. Entrepreneurship might on the other hand help to transform education to better support the society and transform the role of universities, and be recognized as a tool to empowerment and transformation.

What we are trying to identify through this research is how modern tools and concepts combined with entrepreneurship can impact the creation of new businesses but also improve their performance. Along the research we have been aiming at identifying the current needs of entrepreneurs to increase their competitiveness and how collaboration with educational institutions would create a positive impact both on the economy and the future workforce, through the teachers.

V. Results

The results collected have been organized in four categories following the frame of the discussions: 1) entrepreneurship and innovation, 2) University Business Collaboration, 3) a career option and 4) entrepreneurship education in the future.

Entrepreneurship and Innovation

As mentioned in the previous sector, different audience understands entrepreneurship in various way. This was confirmed during the focus group discussions where it seemed important to define first the term of entrepreneurship.

Below are two definition of entrepreneurship from the perspective of the teachers:

The ability to seek new opportunities that have not been encountered before, to challenge the status quo, *do something new, to be outside of the comfort zone and to be empathetic.*

A participant mentioned interdisciplinary centres in which entrepreneurship means being able to make new connections between knowledge, information and people.

An entrepreneur is also seen as someone who is solution-driven, have a long-term vision, who is a visionary and someone who as the ability to imagine something that does not already exist, something that might even been seen as "crazy". Being entrepreneurial refers to the ability to become creative in order to achieve one's goals and dreams despite resources boundaries. It is a combination of vision and conviction (usually people might have one out of two) for another one. It is a disposition, a mind-set, which comes from embodied characteristics in one's character as imaginativeness and lacking the common risk aversion.

As we can notice, these definitions are both very innovation oriented. The entrepreneurs and students might have a different vision of what entrepreneurship is, as it was mentioned earlier that the challenge with entrepreneurship is that different audience can give different definition to the concept. According to Merriam-Webster dictionary an entrepreneur is someone who organises, manages, and assumes the risks of a business or enterprise. This latest definition considers also a self-employed to be an entrepreneur, even though the nature of the business might not be innovative as such. The definitions given by the teachers might indicate that entrepreneurship taught at university might be more innovation oriented and somewhat limited.

Business Development

To develop their business, entrepreneurs are currently using the following channels to increase their knowledge:

- seminars, conferences, workshops, camps
- reading
- networking
- recruiting interns
- being mentored
- learning from own experience, experimenting
- lifelong learning: MOOCs, e-learning, course
- following innovation trends within their business sector and of their competitors

They are using a mix of face-to-face and digital sources to get new knowhow.

It appears several time that for the innovation to happen, the entrepreneur and employees should have certain skill set, but the culture within the company also needs to support the individual in order to allow innovation to take place.

Students capability to innovate
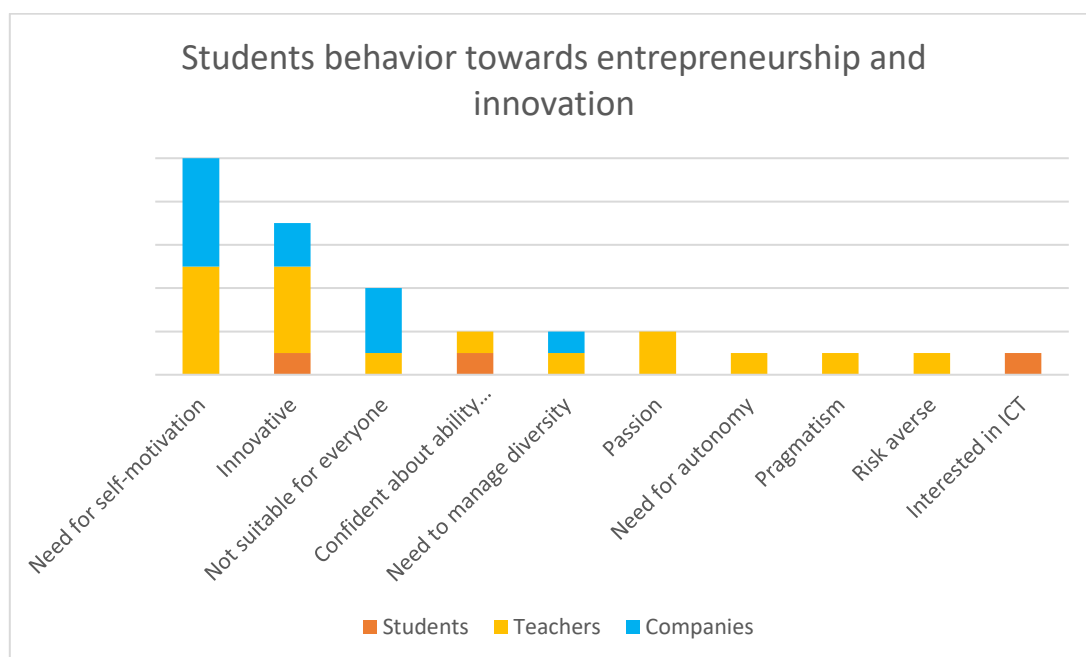
The graph represents the students' innovativeness according to the students themselves, the teachers and companies. Both the teachers and entrepreneurs agree to say that students need some self-motivation and constantly need to be pushed to be motivated, beyond getting study credits. They realize that entrepreneurship is not suitable for everyone but that entrepreneurial behaviour can be encouraged to promote specific skills needed for successful business. They do

share the same viewpoint that students are innovative and working with students and younger generation can bring a new perspective to the business.

The teachers consider their students to be rather passionate, pragmatic and risk averse.

Students also perceive themselves as innovative and with a good skill set to run a business. ICT is perceived to be related to innovation.

Intrapreneurship was also mentioned as an alternative to entrepreneurship. The difference between intrapreneurship and entrepreneurship is that intrapreneurship happens within an established corporation or organisation whereas entrepreneurship is pursued through a new firm (a start-up) established primarily for that purpose. An intrapreneur is commonly thought of as an employee inside a corporation who stays in-house to pursue her idea[19]. In order to be a successful intrapreneur, students would need to have a specific set of skills which can be fostered through entrepreneurial and innovative education.

Supporting entrepreneurial and innovative education

In this section are presented the tools teachers are currently using to foster entrepreneurial and innovative behaviour in their classroom (graph "Tools currently used by teachers") and the methods students and teachers see as supporting entrepreneurial behaviour (graph "Approach supporting entrepreneurship education").

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[19] D. Ibrahim, M.Washington, L. Law Review; Intrapreneurship. Lexington Vol. 73, Iss. 4, (Fall 2016): 1741-1793.

Tools currently used by teachers

Tool	
Future thinking	▬
Peer assesment	▬
Brainstorming	▬
Problem solving	▬
Gamification	▬
Design thinking	▬
Guest lectures / conferences	▬
Networking	▬▬
Creative thinking	▬▬
Lecturing by students / autonomy in learning	▬▬▬
Error and trial	▬▬▬
Digital learning	▬▬▬▬
Teamwork, multidisciplinary work	▬▬▬▬▬
Work-based learning	▬▬▬▬▬
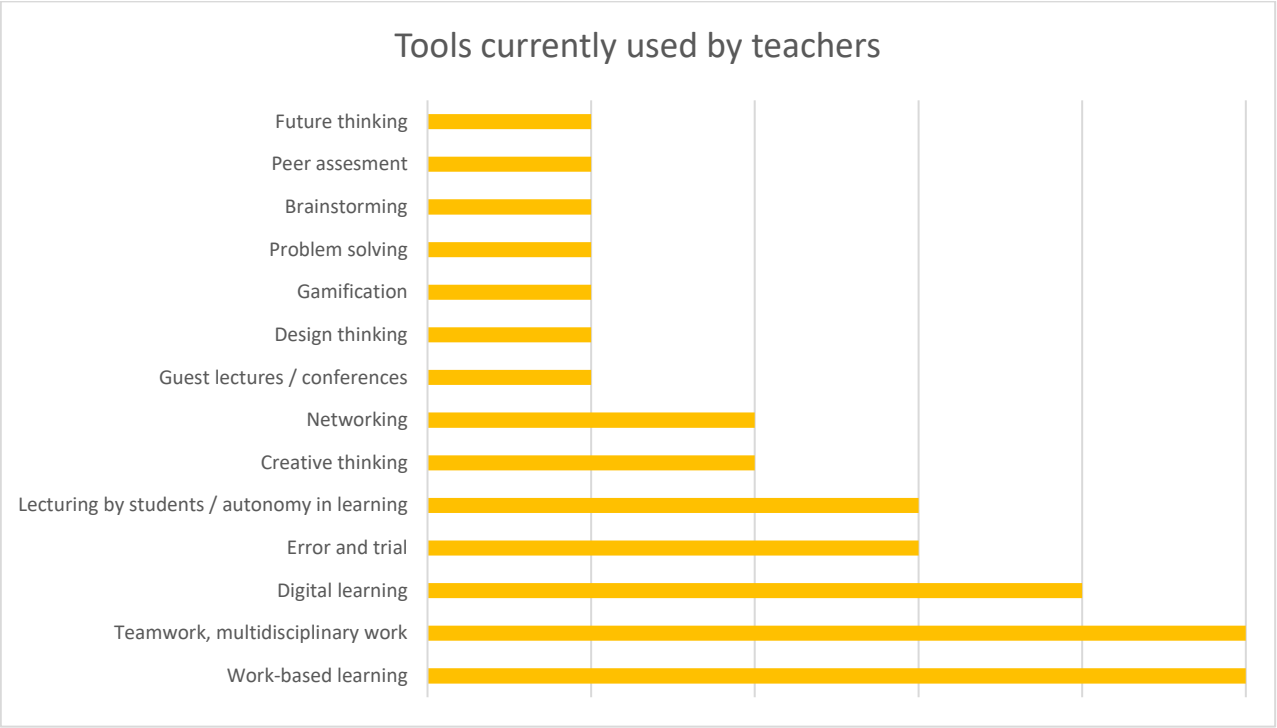
The most commonly innovative tools used to foster entrepreneurialism and innovation to the students are work-based learning, multidisciplinary and teamwork, followed by digital learning. Digitalisation of learning and teaching seems to be commonly associated with innovation. It is interesting to observe that teachers are also supporting trial and error, as recommended by the entrepreneurs. Learning through failing was seen as important from the point of view of the companies. Creative thinking, design-thinking and gamification are also somewhat used by the teachers which is well in line with our project.

The graph below presents a list of practices that would support the best entrepreneurial and innovative education, according to the students and teachers. These two graphs can be compared to also identify similarities between tools already used by the teachers and methods that should be more used according to the students.

Approach supporting entrepreneurial innovation
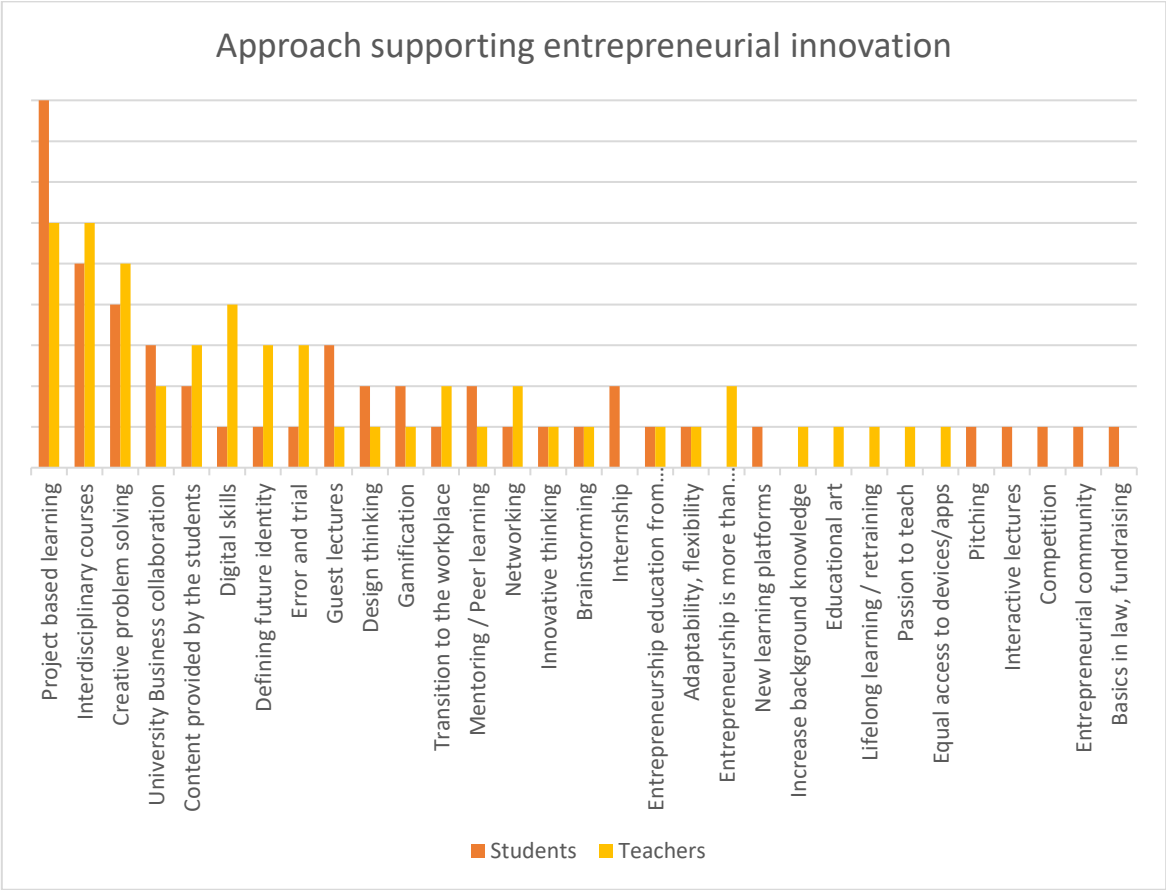
According to the students, project based learning would support best entrepreneurial and innovative teaching, followed by interdisciplinary courses. This is well in line with the tools already used by the teachers and confirms the results found from the previous graph. Students wish to have more lectures provided by guest and that the content would be more creative problem solving oriented. They are looking for more multidisciplinary lectures which they estimated as being important to build their network and get new skillset to eventually start a business. Despite the feedback received from the companies on the students' lack of motivation while doing internships, the students did seem to value work placements as a way to acquire new knowledge and be more innovative.

From the graph we can see that teachers and students are both in favour of student learning autonomy and to let students provide the content.
From the results collected, we can observe that students are well aware of innovative approaches and their use in the business world, such as creative problem solving, design-thinking, brainstorming, pitching and competition. Developing creative thinking was one of the objective of the teachers and seems already in use. Gamification was also cited several times by the students and is once again in line with the methods used by the teachers. Though, we could say that students wish to see more gamified and digitalized content. The teachers are also well in favour of digital skills to support innovation.

Both students and teachers agree that collaborating with the industry would support a more entrepreneurial and innovative teaching approach.

Teachers mentioned several times that with entrepreneurship education one should also keep in mind that entrepreneurship and becoming an entrepreneur is not for everyone. Entrepreneurialism can be taught and entrepreneurial skills can be developed but students should not be pushed to become entrepreneurs. During the discussions, the business representatives also agreed that for an enterprise to be successful, there should be different kind of employees and that businesses also need employees who are experts in their field and less entrepreneurial to ensure the right skills stays in the company and does not constantly look for other opportunities.

It also came up several time that students need to be guided during their studies in order to identify their future work identity but also to help them to transfer from student to career status. When graduating, students do not consider themselves as unemployed but more in transition from studentship to employment. Students mentioned that they would need both education providers and companies to see this transition period from a different angle to provide additional opportunities for the former students to build their career, e.g. networking, specific set of skills, mentoring, etc.

Some of the entrepreneurs interviewed have recently graduated and several of them mentioned that they wish that during their studies they would get more practical knowledge to run their business, such as basics of law, taxation to ease the entrepreneur in becoming employer. They felt that it was the responsibility of the university who provides entrepreneurship education to also give them the tools to survive in the practical context of running a business.

University-Business Collaboration

As we have seen above, teachers and students are in favour of developing collaboration with companies since it is a rather common process in the field of education. The interviewed entrepreneurs share the same interest and have suggested ways for development.
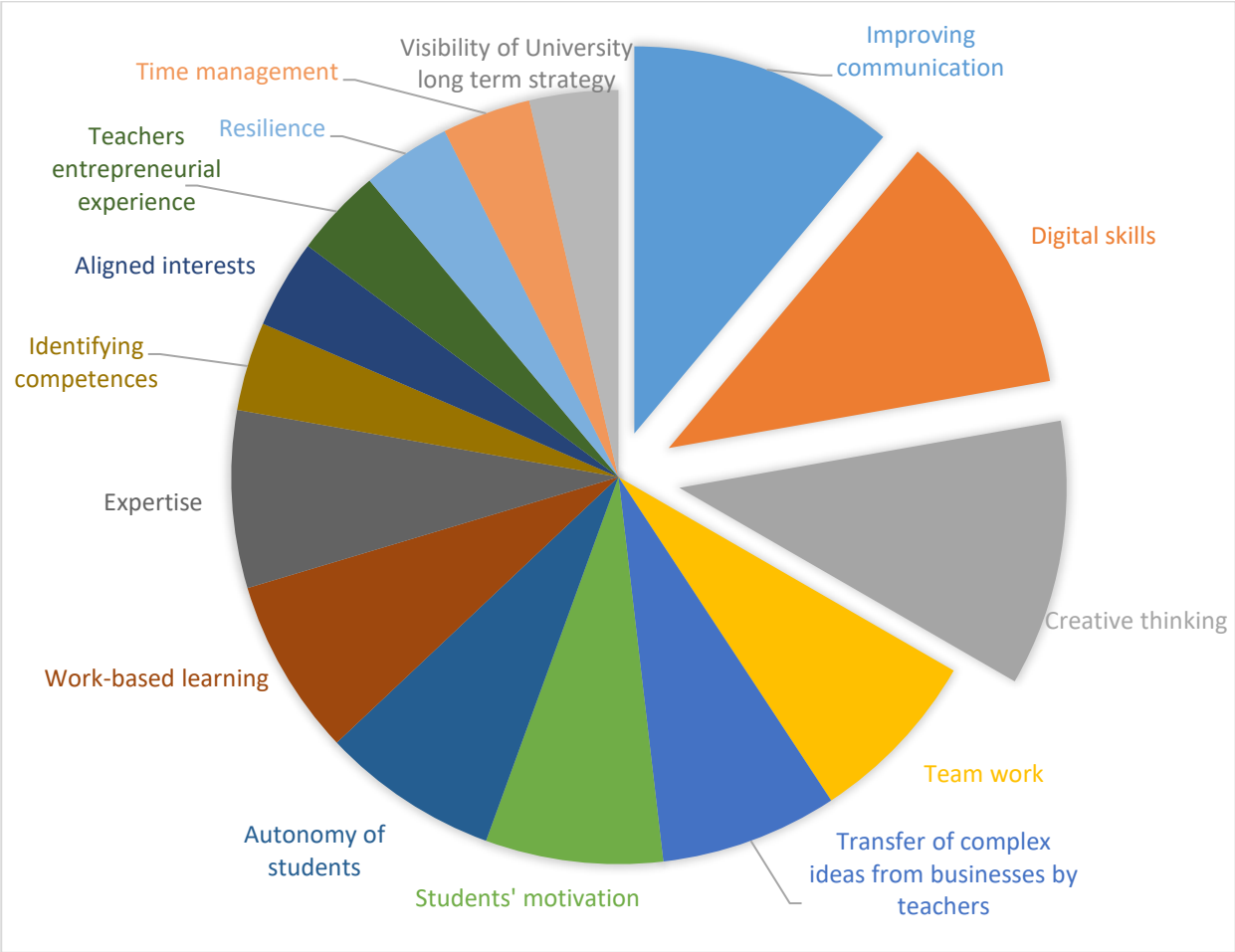
The entrepreneurs wish that communication with the educational institutions would be improved. They named for example having a contact person to reach more directly, instead of using personal contact if existing. They also wish that the universities would communicate better about their long term strategy which could be referred to align interests. One entrepreneur mentioned that on the other hand the professors and lecturers are easy to reach and that collaboration can be organized in a very unformal and rapid manner.

They would also prefer that students have better digital skills, are able to work within a team and bring creative thinking into the company. They wish that students would be more autonomous in their work, during internship for example, as start-ups do not have resources to train interns. They wish they would be more independent and able to take initiatives. Several business representatives also stated the challenge with students motivation as in many cases, students are working at a company to get credits but do not have personal motivation to acquire experience and apply their skills. This is well in line with the comments from the students about their motivation and how they wish their studies would be better connected and integrated as a one project type of work to understand better how the skills taught would be used in practice.

The companies also mentioned several time that **the learning culture should change so that students are less afraid of making mistakes. Students should learn from failing and have experience how to rebound after failing to learn to become resilient.** This is again well in line with the methods used by the teachers to conduct a more trial and error approach.

Regarding work placement, some students mentioned that they were not as efficient as they hoped mostly because the tasks they were given did not match with their studies and were more assistant mission. On the other hand, other students mentioned that getting work experience while still studying is a great opportunity to observe, to learn about leadership and team management, problem solving, etc.

A career option

Skills of a successful entrepreneur

During the discussions, entrepreneurs and students were asked to identify the necessary skills to become a successful entrepreneur. On the graph below, we can see the set of skills identified by the companies and students. The skills mentioned several times are identified by a taller column. In blue are the skills identified by the entrepreneurs and in orange the skills identified by the students.

Entrepreneurs and students both identify leadership and management, communication skills, thinking outside of the box and curiosity, resilience and sales and marketing as the most important skills an entrepreneur should have. **It is interesting to notice that only students mentioned that customer orientation is an important skill while it was not mentioned by the entrepreneurs at all**.

Better technical skills (expertise), mind-set and passion were seen as quite essential to the entrepreneurs. They did mentioned several time that handling stress was a requirement.
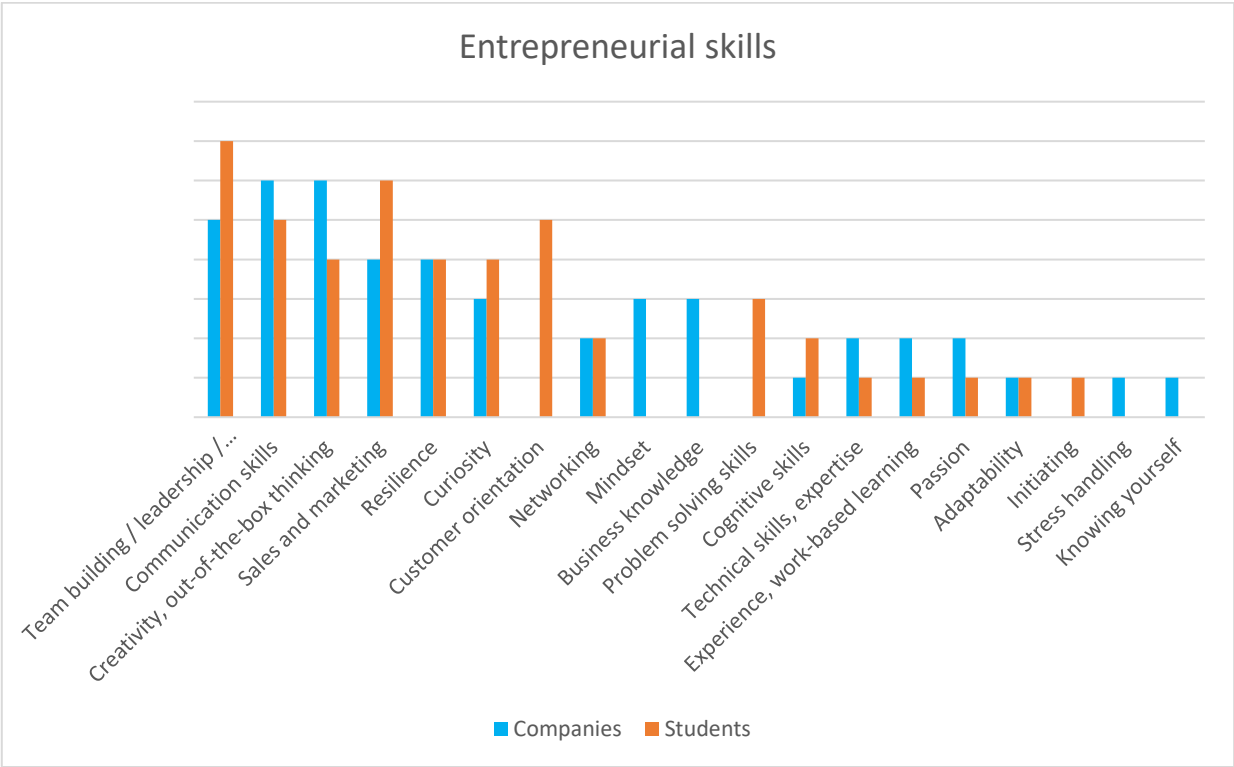
Entrepreneurship Education in the future

The graph below represent the perception of entrepreneurship and innovation education in the next five years.

Students and teachers agree that entrepreneurship education and innovation will improve teaching in the next years. Creative problem solving will be promoted. Education will become more flexible allowing different learning paths and methods.

The students wish that entrepreneurship would be taught earlier, at school, and be embedded into all educational levels. They also perceived that it would have a greater impact on the society. The also expected more gamified content, even though it was not mentioned by the teachers.

According to the teachers, entrepreneurship education and innovation will increase the introduction of new teaching methods, which can correlate with the improved teaching. It was also mentioned that in order to foster innovation, students should have better access to proper devices for learning. This comment was made after the COVID19 pandemic had started, which reinforced the need for online content and the access to digital content.

The future of education
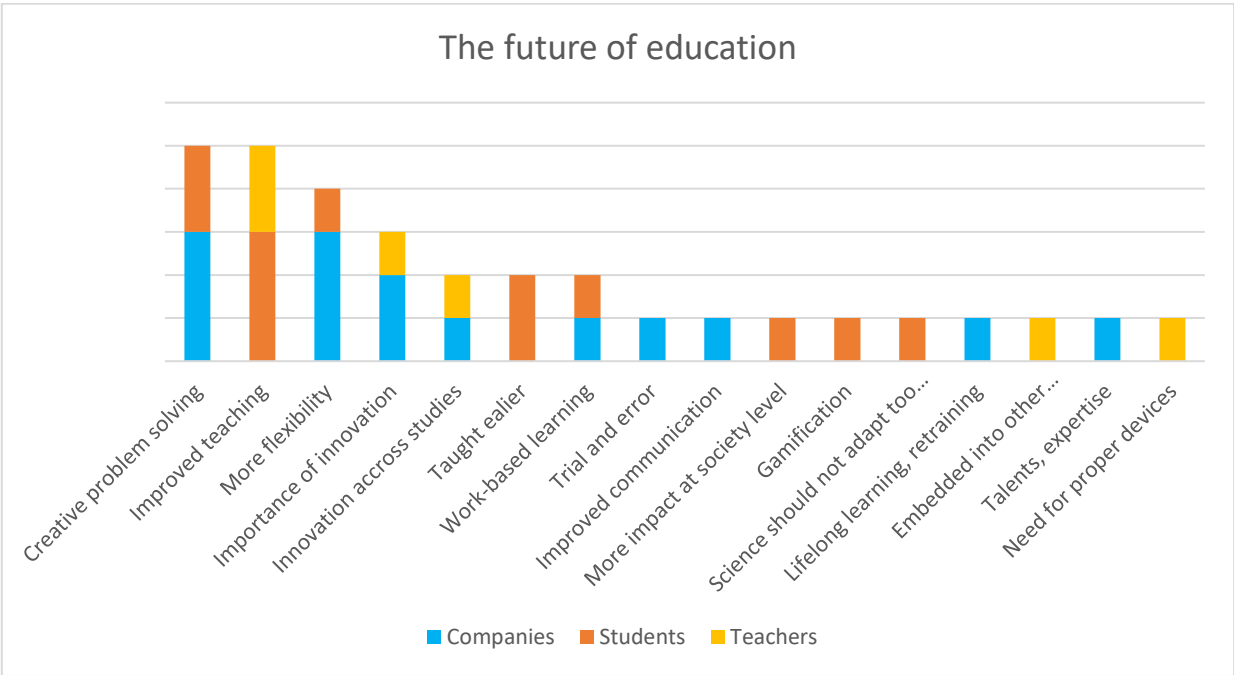
VI. Discussion

Millennials (born between 1982 and 2004) are tech savvy and generally avid users of interactive media and online video games[20], therefore they expect also more sophisticated tools such as simulations in the classroom[21]. Gamification in higher education is mainly focused on computer science, game programming and engineering but is rapidly evolving towards business, marketing, and management as already largely happens in executive education at business schools and corporate universities. Digital forms of education as like as MOOCs are also in the rise[22] not only for their scalability but also for meeting ongoing challenges such as the COVID-19 pandemic. Recent findings show that gamification enhances collaborative and social use which are skills required in entrepreneurship[23].

Through this part we will discuss the results in order to identify rather the findings match with the literature and how they would justify the need for a gamified course to support entrepreneurship and innovation.

The company perspective

The skills

The interviewees from companies easily agreed on the fact that innovation is the essential building block of their entrepreneurial adventure, its essence and its winning asset while facing competition. Differentiation and creativity are the common understanding about the impact brought by innovation.

They shared also the view on what competences are needed for an entrepreneur: apart from own domain-specific knowledge expertise, the entrepreneurs need to be knowledgeable in management, cash flow and accounting, finance and fund raising, marketing and sales. However, all of these competences can be acquired and developed over time.

The interviewed company representatives emphasize the pragmatics of **learning while doing**. In this context the asking of questions and trying is central as well as making sense of the experience, both success and failure. Also learning to use feedback to improve is seen as an important skill, in addition to communication skills.

They highlighted the need for myriad of skills, both internal and external, as well as the right kind of a **mind-set**. According to them, students would benefit learning both the basic "hard skills" in the classroom, but also the innovative skills; and they would gain from exposition to the "real world

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[20] Hanus & Fox, 2015
[21] El-Masri, Tarhini, Hassouna, & Elyas, 2015
[22] Dicheva et al., 2015
[23] Antonaci et al., 2015

complex problems" and **creative problem solving** related. The students should be better equipped with practical training and problem-solving skills. The education is still not ready to prepare the students for the real needs of the recruiters.

The company representatives bring to the fore the growing complexity and the need to adapt to change. An interviewee commented "Nobody knows how the future will be and what kind of skills and knowledge will be needed." They stressed the importance of **trial and error**, experimenting in addition to planning and the mentality of not being afraid of making mistakes. In the context of education this could mean e.g. "find out" type of tasks. A strong need to educate the students for innovation and entrepreneurship is detected. **Resilience** and persistence have been also recognized as great attributes and are tightly linked to learning by making mistakes.

Lifelong learning is a necessity and is fuelled typically by participating in workshops, following MOOCs and traditional courses, performing a permanent technological watch-out. Other relevant sources are given by networking and trial and error, that is, learning from own mistakes. Therefore, what emerges is that **a good mix of hard and soft skills** is required. Emerging necessities will also drive the acquisition of new skills. The level of maturity of a company influences also the kind of competences to be developed. Everyday practice of entrepreneurial activities is the other key learning component for an entrepreneur.

University Business Collaboration

When it comes to the university-business collaboration the companies seek for **two-way learning**, e.g. in form of project-oriented cooperation and dialogue between science and business. Internship and use of intermittent workers are ways for students who have the potential to be hired are tested and taken on board. However, students taken on internships lack of experience on the field and need to be trained on the core technical skills and to develop the good reflexes too. The good side is that they bring in a fresh **new perspective and ideas** as well as their **up-to-date theoretical expertise** which can boost the business.

Most importantly students need to have the right attitude to become a potential new collaborator: 1) adaptability, 2) ability to learn and 3) willingness to grow. Usually it is easier to get along with interns than with academic institutions since their objectives differ: the former look for a real opportunity to improve and test themselves in a real working environment, whilst the latter are mostly focused on spreading students in different companies for their mandatory internships.

The interviewees detected a gap between the universities' long-term problem solving and businesses' short-term problem solving. This result could be discussed as not having a long term vision and pursuing short-term gains and profit might prevent a business to be sustainable and durable.

They pointed out a need for mediators – the "Mavericks" – who have the gradient of both worlds. Interaction between the business and the learning contexts are rather weak and unstructured.

Usually the courses in marketing and entrepreneurship delivered by the interviewed entrepreneurs themselves at universities and academic institutions represent a way to reach prospect collaborators among the students. This way a fruitful collaboration with academic institutions can be started and sustained.

The future

The company representatives posed the question whether everybody needs to be educated on entrepreneurship and innovation and whether we still need "the basic employee" in the future. They also pointed out that innovation is not necessarily a prerequisite for a successful enterprise, and can be compared with the definitions given by the teachers in an earlier section of this report which were more based on innovation.

Societal trend fosters people to become more and more independent from a permanent employment. Therefore, education has to follow this emerging need by focusing on entrepreneurship and innovation in a consistent way and by supporting students to develop their interest in these subjects in two ways: by fully involving students into long term-projects, and by integrating entrepreneurs in the faculty activities.

With the teachers

Entrepreneurship and innovation in the classroom

Many of the teachers interviewed see themselves rather as facilitators than teachers in relation to the students. They stress the importance of creating the right kind of learning environment that supports the learning. The teachers tend to rather talk about approaches than innovative tools.

The teachers bring in the diversity discussion, pointing out that the learners have different backgrounds and resources and that innovation or entrepreneurial behaviour do not look the same for all. This could mean that someone who does not seem suitable to become entrepreneur might play a key role in the business development thanks to an entrepreneurial attitude. Dialogue is needed.

Teachers identify that active practice through role playing and **cases analysis** are considered key factors to develop creativity and entrepreneurial spirit. Students are more motivated when the teachers introduce real life cases into their teaching. This is sought in the present implementation of their courses, but is taken for granted as a fundamental and more generalized building block for the future of education (and not necessarily on entrepreneurship as a domain) in the 5 to 10 years ahead. University teachers are professionals and they are looking for problem-solving attitude and soft skills to be transferred to the students. They also agreed that giving the students more

independency to learn and provide content should be supported by a more **trial and error** approach to encourage them to try. Though it has to be considered that giving more independence to the students in learning might also reduce their motivation to do so. Students need to be pushed and motivated, which is often the case if the content is contextualized.

Self-confidence, curiosity and self-development have to be cultivated and instilled in the students as well in order to foster not only entrepreneurial spirit but also a better way of adapting in an increasingly changing market landscape. Teachers from vocational education are calling for more work-based learning.

Developing own competences

Getting out of own comfort zone is a basic requirement for the teachers themselves to keep their knowledge up-to-date and validated by practice. Teachers are expected to be autonomous in their innovative and entrepreneurial learning and they are **constantly looking for opportunities** to get in contact with the enterprises.

Also, being exposed to different sources of inspiration (conferences, networking, events, cultural and artistic material, and, of course, scientific literature) is important for both teachers and students, since the context can affect enormously the attitude towards innovation and undertaking new challenges.

A general consideration should be related to the perception of the needs, for the educators to innovate the learning contexts in line with real needs for future jobs and entrepreneurship.

Some of the interviewees also mentioned developing their teaching methods by collaborating with other teachers and researchers to discuss about the goal of the courses, content, assignments, etc.

The future

The interviewees pointed out there is no certainty about how the future will be like and that there is no recipe to teach. Hence, they aim at "turning the students' switches on" – making them start questioning and finding answers by themselves.

As for developing their teaching, the teachers recognize that they should be collaborating more with entrepreneurs to better understand the business life from their perspective.

With the students

There is a different self-perception about the personal level of entrepreneurial spirit and of the attitude to innovate depending on the experiences and possibly also on the level of maturity in such young people. Both aspects are greatly impacted by the level of self-confidence acquired so far.

Learning to work

The students interviewed focused much on the working life requirements in the discussion. They are prone to think that there is a gap between the required working life skills and the skills and knowledge acquired in education, and pointed out that the studies and the working life are very much separated. They were very keen on solving this mismatch and gave lot of practical ideas for tools. These students seemed to have a good idea about the available innovative tools.

The students pointed out that they need to develop a vast variety of skills, starting from the basic skills. To obtain them, they may seek many different sources: volunteering, work placements, networks… They would be delighted to see more **project-orientation, problem-solving, exposure to practical real life problems, interdisciplinary courses** and such in their education. They also called for cooperation between the faculties.

According to the students, a vast and varied range of competences is necessary to become a good entrepreneur. A good mix of managerial (empowering and delegation, strategy, quality) and business skills have to be necessarily complemented by a solid set of soft skills (collaboration, networking, communication, team building, negotiation, leadership) and attitudes (being rigorous) is needed. But in particular two mind-sets can really make the difference: curiosity and service. The first one is the driver of innovation and of attracting the right people to collaborate with. The second one is the driver of the commercial success.

Networking and any personal working experiences have largely contributed to start developing the necessary competences to become entrepreneurs. In the most fortunate case also the school provided the good settings for this.

Serious games and project-based learning are certainly useful tools that can be implemented in order to step ahead, but what would make the real difference to grow own entrepreneurial spirit and capacities is a direct contact with entrepreneurs. In that case, workshops, conferences, but most of all, mentoring and tutoring would represent the real change maker.

There is generally a good perception about the level of innovation and entrepreneurialism of the educational institution, but this might vary, in particular for what concerns the innovativeness, according to the different cases.

Career orientation

Students are lacking a clear vision about their careers and have a strong need to learn from practical work-based learning contexts.

The students stress the importance of experience and having a well-developed network before starting an enterprise. Time for maturing is important. They also pointed out how important it is to understand your own value as a professional.

It is evident also that the self-entrepreneurship is not considered as an option mainly because of the self-confidence not stimulated in the formal education contexts. Becoming an entrepreneur in the short term in not necessarily a must for the interviewed students. However, this depends also by the kind of curriculum they are following: a UX designer is certainly keen in starting a freelance career rather than students in business and communication studies that prefer to accumulate experience before deciding to become independent consultant or even entrepreneurs. In any case the challenges that are related to start an entrepreneurial endeavour are considered and evaluated, including the work versus private life balance. When confronted to the search of a job or of an internship, there is generally a good attitude to keep the door open not only to get in depth on the core competences of the professional domain but also to learn new skills. However, the employment should not be too far from the core interests.

In general, the students would like the educational institutions to help them in filling up the knowledge gaps they believe they have, in particular in relation with their specific curricula that cannot cover all the skills that they identified. Noticeably, they would like to be helped in understanding better the self, in order to know own forces and weaknesses, as well as learning how to interrelate with other people, being these fundamental assets to be an entrepreneur. A change in culture is also requested, in particular for what concerns the perception of failure as a learning experience rather than a blocking obstacle. Finally, a closer relation with the market and the real business world is important to get the right perception of own value.

The main driver is given by the desire to learn more and, at the same time, to be better prepared and having better chances for a professional career. Knowledge of the sector has been mostly developed through the educational environment and then reinforced through personal experiences.

The future of education

The students have a positive perception about the future of educating on entrepreneurship and innovation in the future. This would be an important lever to the emergence of new start-ups and would be particularly effective in domains at high technological impact like engineering. However, it would be better whether these topics would be introduced in the educational system at an earlier stage as it happens in other countries, like in Sweden (with the use of role playing in kindergartens and primary schools).

There is not a one solution fits all to get a better education on entrepreneurship and innovation. A mix of new learning platforms, project-based learning along with a greater involvement of experienced entrepreneurs and the provision of better tools to contribute to this goal.

VII. Conclusions

Through this report we have been identifying skillsets, gaps and wish for the future from the three main stakeholders supporting education: the students, the teachers and the entrepreneurs/company representatives.

From the findings we can easily conclude that there is a clear gap between the skills needed on the job market and the knowhow provided to the students. We can recommend that that educational institutions would put more resources to encourage the teaching staff to collaborate more with the business sector but that they would also provide services for the teachers to develop their teaching skills together. Focusing on problem-solving and real life cases seems to be the right option. Traditional lecturing combined with digital education, enhanced with gamification techniques, would allow students to develop certain skills needed when starting their career but also supporting an entrepreneurial mind-set. Entrepreneurship education and entrepreneurial courses should consider extending their offer to entrepreneurial skills and mind-set and focus less on tools and methods to start a business, as entrepreneurship is not for everyone, but everyone would need to have a certain entrepreneurial mind-set.

It is even truer in the current context and since the COVID19 pandemic from spring 2020, that online education offers new learning possibilities that the newer generation is graving for. Introducing gamified content would encourage involvement and competition which was mentioned as one motivation factor by the students to learn and supporting entrepreneurial attitude.

Along the research we have identified the importance of creativity and creative problem solving, supporting entrepreneurialism and innovation. In addition, the students were relating the importance of serving the customers, understanding their needs and be more consumer oriented. These results also show the relevancy of incorporating creative problem-solving and human-centred design methodologies like design-thinking to entrepreneurship to boost the innovation potential of start-ups and companies in general.

Therefore, the next logical steps of the CDTMOOC project is to address the gaps and develop a more innovative approach for higher education teachers and students, as well as entrepreneurs, to reach the current needs of the business sector and enhance innovation in general. CDTMOOC project will focus on gamified MOOCs as an alternative path to attain this goal.

VIII. Annexes

Focus Group Interview Guide

Introducing CDTMOOC project and the research

This framework for focus group interview is aiming at i**dentify the real needs and challenges in terms of education and learning in entrepreneurship and innovation** of each partner country: Finland, Italy, Luxembourg, France and Iceland.

The interviews are focusing on the representatives of the triangle:
- Academics, professors and teachers
- SMEs and entrepreneurs
- and students mainly from higher education institutions but also from Vocational Education and Training Institutions.
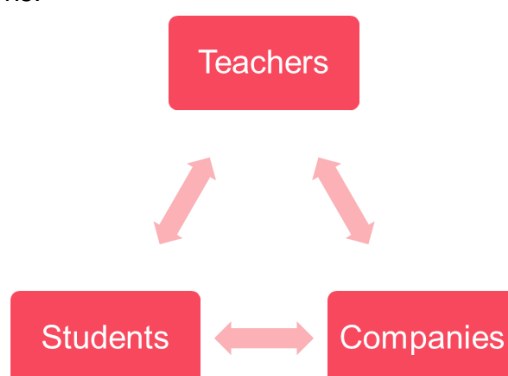
From this analysis is emerging the needs and suggestions about the **ways to implement in a more effective way the entrepreneurial education**.

Research method: interviews of teachers, companies and students

The evidence occurred, results and feedbacks with special evidence to the emerging challenges and needs in each partner country from the interviews will be reported by each partner in English. General challenges across the partner countries will be identified and possible ways to implement an effective transformation in the entrepreneurial educational system will emerge. These results will be available under an interactive report in English, Finnish, Italian, French, Icelandic and Luxembourgish and consultable online on ISSUU platform.

Answers are anonymous

Interview frame to companies

Based on your experience, what are the skills (soft and hard skills) required to become a successful entrepreneur?

How do you acquire the further skills you need to develop your business?

How does innovation play a role in the development of your business?

When working with students and/or collaborating with education institutions, what skills are you looking for?

What should educators do to make students more entrepreneurial and innovative by the time they graduate?

Which challenges or weaknesses can you identify as a professional in terms of collaboration with education providers / students?

Which threats / demand for change can you identify that have emerged in relation to your cooperation with education providers / students within the last 5 years?

What kind of educational support would you need to ensure your business remains competitive and successful?

In your opinion, what role will entrepreneurship and innovation play in education in the next 5 years? 10 years?

Interview frame to teachers

How would your students describe your innovativeness and entrepreneurialism in your teaching?

How do you transfer innovative and entrepreneurial mind-set to your students?

What are the newest teaching tools/methods that you use to stay innovative? Can you give an example?

How do you receive feedback on the content and methodology of your teaching?

Within the next 5 years, what will you need to stay innovative and become more entrepreneurial in your teaching?

How entrepreneurial and innovative are your students? How interested are they in these topics?

What are the main challenges you can identify when preparing the students to be entrepreneurial and innovative?

In your opinion, what role will entrepreneurship and innovation play in education in the next 5 years? 10 years?

In an optimal world, what do you think could ensure the best entrepreneurial-oriented and innovative education?

Interview frame to students

As a student, what skills do you see are necessary to become a successful entrepreneur?

What skills do you wish that your degree would provide you with to become entrepreneurial and innovative?

What tools/methods (e.g. company cases, flipped classrooms, interactive presentations, etc.) do you wish your teachers would use to become entrepreneurial and innovative?

Would you say that the institution where you are studying is entrepreneurial and innovative? How could it improve?

Do you consider yourself entrepreneurial and innovative? Why?

From where have you gained your knowledge of the industry you are trained for?

Are you considering to become an entrepreneur after graduation, and if yes, can you already identify skills and tools you would need to succeed?

When applying for a job/internship, what do you look for? What type of skills do you want to develop?

In your opinion, what role will entrepreneurship and innovation play in education in the next 5 years?

In an optimal world, what do you think could ensure the best entrepreneurial-oriented and innovative education?

Annex 2 – Findings from University of Turku, Finland

Outcomes from the group discussions with companies, UTU

Validity of the results

The companies interviewed were selected based on previous collaboration and recommendations from the SparkUp co-working space. Not all companies have been previously collaborating with the University which gave a wider perspective to the topic. Also interviewees did not all know each other. Companies are operating in different field (consulting agency, quality of air measurement, online education provider, and augmented reality services).

To introduce the focus group, a brief presentation of the project and the method used for the data collection were presented using PowerPoint.

General observations on discussion with companies

The interviewed company representatives emphasize the **pragmatics** of **learning while doing**. In this context the asking of questions and trying is central according to the interviewees. Also learning to use feedback to improve is seen as an important skill, in addition to communication skills.

They highlight the need for **myriad of skills**, both **internal and external**, as well as the right kind of a **mind-set**. According to them students would benefit learning both the **basic "hard skills"** in the classroom, but also the **innovative skills;** and they would gain from exposition to the "**real world complex problems**" and creative problem solving related.

The company representatives bring to the fore the **growing complexity** and the need to adapt to change. The interviewee commented "Nobody knows how the future will be and what kind of skills and knowledge will be needed." With respect to they stress the importance of **trial and error, experimenting** in addition to planning and the mentality of **not being afraid of mistakes**. In the context of education this could mean e.g. "find out" type of tasks and creative problem solving challenges, the company representatives suggest.

When it comes to the university-business collaboration the companies seek for **two-way learning**, e.g. in form of **project-oriented co-operation** and **dialogue** between science and business. The interviewees detected a gap between the universities' long-term problem solving and businesses' short-term problem solving. They pointed out a need of mediators – the "Mavericks" – who have the gradient of both worlds.

The company representatives posed the question whether everybody needs to be educated on entrepreneurship and innovation and whether we still need "the basic employee" in the future. They also pointed out that innovation is not necessarily a prerequisite for a successful enterprise.

BUSINESS DEVELOPMENT

Skills for entrepreneurs – existing and needed

- Internal skills
  - ➔ mind-set ("great ideas are not enough")
  - ➔ stress handling
  - ➔ knowing yourself
  - ➔ ability to take different perspectives
  - ➔ micro skills
  - ➔ creativity
  - ➔ communication skills
- External skills
  - - basic business knowledge
  - - sales and marketing skills
  - - multi skills
- Entrepreneurial mind-set
  - - stress on pragmatism
  - - interested on everything
  - - handle failure
  - - persistence
  - - ability to take calculated risks

- Know-how on creating and communicating the business value
  - ➔ how to differentiate?
- Ability to deal with complexity, both in regard to
  - ➔ the growing complexity in society, and;
  - ➔ entrepreneurship as dealing with a messy mix of things
- Long-term perspective on doing
  - - continuous learning and not giving up
  - - adapting to the change
- Mental capability
  - - knowing yourself
  - - vulnerability
  - - ability to take criticism
  - - dealing with conflict
  - -"you are never ready"
- Good motivation, what are own goals, how to reach them, spilt them in smaller steps
- willingness to learn (mentors, courses at university, online courses, entrepreneurship community)

Additional comments and suggestions:

"Doesn't necessarily need to be innovative, you can be successful without innovation as well."

"Have time to reflect: collect data, make internal diaries, chats. Working individually and creating partner networks as well."

Innovation in the business development

- "Do, notice, reflect, action"
- Looking for interesting things everywhere: seminars, reading, talk with people
- innovation to come up with new solutions

UNIVERSITY-BUSINESS COLLABORATION

Collaboration with education providers and students

- More communication between universities and businesses
- Lack of visibility => attending events, entrepreneurs are not aware of possible collaboration
- "Lunch with the professor" to learn about the long-term thinking
- "We need "Maverick" teachers who are able to transfer very complex ideas and have gradient between both education and business worlds."
- Teachers should be exposed to entrepreneurship
- There should be learning both ways
    - ➔ understanding learning
    - ➔ understanding entrepreneurship
- The student needed more skills to work independently as start-up did not have resources to guide the intern
- Skill set of the students is not enough (for programming)

Students' entrepreneurialism and innovativeness

- students should be pushed to jump
- team work is important to find like-minded people
- going through very innovative cases is inspiring
- more hands on entrepreneurship skills such as tax plan, what has to be considered to protect your company, agreements, etc.
- a more design thinking approach is needed to discuss with end users, the problem has to be validated first
- Should be self-motivation beyond credits
- You shouldn't be afraid of saying something wrong

- "some **basic skills** need to be taught in the classroom, but **practical skills** should be taught right after the hard skills have been developed"
- Attention on diversity: you can be innovative without appearing innovative (e.g. introverted students)
- "University should be a place to **try things differently**, not to go the same wrong way"

Additional comments and suggestions:

"There are 3 types of students." The ones who:

-> just cruise through the studies ("basic" employees)
-> top students (future managers)
-> out-of-the-box thinkers (innovators)

"<u>Not everyone needs to be the innovator</u>. There's a threat that the innovator doesn't work for you a long time, when he discovers something new."

Suggested tools or approaches for helping students:

Name of tool/method/approach
- Capstone approach
- Learning to learn –strategies
- Trying things in different ways
- both the core understanding and creativeness
- Conflict management skills
- Confidence boost –event
- Workshop "How I know how to grab the knowledge while I go"
- Fertilizing a mind-set", instead of teaching
-"Trial and error"
-Project orientation in teaching
-Solving real world complex problems
-Science parks
-Exposing of teachers to businesses/entrepreneurship
-Learning both ways (understanding learning and understanding business)
-Facilitating entrepreneurship, e.g. by linking students with investors
-Teacher as facilitator
-Creative problem solving
-"Find out" type of tasks
-Creating experiential mind-sets, not only planning mind-sets.
-Finding by yourself

Challenges encountered

- Universities are very good at **long-term problem-solving**,

Businesses are very good at **short-term problem-solving**

➔ How to deal with this misfit?

- Dealing with students different than dealing with employees
- Teachers not exposed to business or entrepreneurship
- Level of **complexity grows** -> you need to be able to **experiment**
- The culture of being afraid to say something wrong
- Pressure for students to graduate faster limit their possibility to take part in such company projects

Additional comments and suggestions:

"Creativeness is not enough, you also need core understanding."

Threats and demand for change

- Culture of "being afraid of mistakes" has to be changed

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Educational support needed for business development

- The society coming along -> e.g. basic income
- understanding the value in the future
- Universities are very good at long term-thinking
    ➔ "How could I be linked to that thinking?"
- "Lunch with the professor" to learn about the long-term thinking
- Communication between universities and businesses
- Networking skills, team skills
- Help with hands on
- To be pushed to step out of own comfort zone
- How to run pilots, how to prototype = system to get feedback, how to talk with users
- Branding skills

Role of entrepreneurship and innovation in education in the next 5 years?

- "Innovation will be very important, more and more people need to be innovative."
- "Innovation is not a must"
- "The most important is to find the right person to the job"
- Knowing oneself is important to find the core of what you're doing
    ➔ "you need to be challenged for that"
- The university should provide creative problem-solving

- "You cannot just plan, experiment!" -> Learning two mind-sets.
- More communication between universities and businesses
- "We need "Maverick" teachers who are able to transfer very complex ideas and have gradient between both education and business worlds."
- Courses will be put on value chain and will be integrated and offered as a package
- Students might do a double degree and entrepreneurship will be integrated to economics
- Need for more freedom and flexibility to do what people want
- Will to learn more all the time

Outcomes from the group discussions with teachers

Validity of the results

The teachers interviewed are all from the University of Turku, but from different faculties: IT, International Business, Language, Dentistry and Entrepreneurship unit. Not all teachers knew each other before the discussion. Not all teachers are familiar with entrepreneurship education or entrepreneurial teaching.

To introduce the focus group, a brief presentation of the project and the method used for the data collection were presented using PowerPoint.

General observations on discussion with teachers

Many of the teachers interviewed see themselves rather *facilitating* than teaching the students. They stress the importance of creating the right kind of *learning environment* that supports the learning.

The interviewees pointed out there is no certainty about how the future will be like and that there is no recipe to teach. Hence, they aim at "*turning the students' switches on*" – making them start *questioning* and *finding answers by themselves*.

The teachers tend **rather talk about approaches than innovative tools**.

The teachers bring in the diversity discussion, pointing out that the learners have different backgrounds and resources and that innovation or entrepreneurial behaviour does not look the same for all. This could mean that someone who does not *seem* suitable might play a key role in success. Dialogue is needed.

ENTREPRENEURSHIP AND INNOVATION IN TEACHING

Innovation in teaching

- Facilitating of learning
- Supportive learning environment
- students finding questions and answers by themselves
- Ensuring teamwork
- Teaching strategic thinking which involves creative thinking
- Future thinking
- "No teaching" -> Flipped classroom
- Do-it-yourself thinking
- "Why" and "how" questions
- Real life case
- Group challenge
- Projects (problem-based learning)
- Settings or approaches rather than tools
- Error and trial
- Inquiry-based learning
- Lectures in video format
- Choice-game / gamification
- Students as producers of lectures
- Action research as tool for the teacher

Additional comments and suggestions:

A teacher pointed out that there are 3 elements of learning:

1. content (theoretical understanding)

2. innovativeness (action to apply their knowledge)

3. reflection (find ways to creating value for organisations and themselves)

Feedback

- Revisiting and assessing frequently
- Questionnaires with open-ended questions
  note: on work-intensive courses students report the course affecting their lives in general.
- Reflections by the students
- "Joint agreement" with expert learners
- Feedback session to get two-way feedback
- Writing a note for next year's students

ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

Students' entrepreneurialism and innovativeness

- This depends on the learning environment
- Depends also on individual and on the group they are in
- Entrepreneurial attitude not necessarily related to money-making
- Valuing diversity:
- students are used to different learning environments
- there are people with different resources
- someone who doesn't <u>seem</u> suitable may play the key role regarding innovation (talent and creativity in the substance)
- dialogue is important

Challenges encountered

- "Not everyone is suitable to become an entrepreneur, you need employees too."
- Managing diversity
- Entrepreneurial behaviour doesn't look the same for all
- teaching introverted students to give presentations and talk with people
- Role of self-regulation: taking responsibility is easier for others
- Different backgrounds, different background knowledge
- "How to understand people/customers?"

Additional comments and suggestions:

"The attitude has been created already on earlier age."

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- Responding to the growing complexity -> no certainty about the right thing
- Different from context to context and discipline to discipline
- Different perspective needed, not just the hero stories

Additional comments and suggestions:

"Do we also need people who are out of this innovation thinking?" ("basic employees")
"What to answer to a 16-year old?" -> how to have a good life? Perhaps: "Try" and "Find yourself"

How to ensure the best entrepreneurial-oriented and innovative education

- "Our role is to bring critical creative problem-solvers that can work in teams."
- Creating innovative ways to see things.

- "What will be your desired future?" "We will help you finding out".
- Helping students to transition to the workplace.
- Figuring out their future identity.

Additional comments and suggestions:

"No recipe of steps to follow."

Outcomes from the group discussions with students, UTU

Validity of the results

The results are based on focus group discussion and survey, representing half and half of the answers. The same questions were asked in the survey as in the group discussion.

The participants to the group discussion were approached and selected by the student entrepreneurial community Boost Turku. This implies that all participants were somewhat familiar with entrepreneurship. The participants came from the University of Turku but also Åbo Akademi (Swedish speaking university) and the Turku University of Applied Sciences. The students had different backgrounds. Some came from the business school, others from IT department while some had a sociologist background.

The students who took part in the survey have been enrolled in entrepreneurship courses for non-business students.

To introduce the focus group, a brief presentation of the project and the method used for the data collection were presented using PowerPoint.

General observations on discussion with students:

The students interviewed focused much on the *working life requirements* in the discussion. They are prone to think that there is a gap between the required working life skills and the skills and knowledge acquired at the university, and pointed out that the studies and the working life are very much separated in Finland. They were very keen on solving this mismatch and gave **lot of practical ideas for tools**. These students seemed to have a good idea about the available innovative tools. Some of them had joined innovative challenges and activities within or outside the university.

The students pointed out that they need to **develop a vast variety of skills**, starting from the basic skills. In obtaining skills they may seek many different sources: volunteering, work placements, networks… They would be delighted to see more **project-orientation**, **problem-solving**, exposure to practical **real life problems, interdisciplinary** courses and such in their education. They also call for **co-operation between the faculties**.

The students stress the importance of *experience* and getting to know people before starting an enterprise. -> *Time for maturing* is important. They also pointed out how important it is to **understand your own value** as a professional.

ENTREPRENEURSHIP AND INNOVATION IN STUDIES

Skills for entrepreneurs

- Teambuilding skills
- Negotiating
- Problem-solving skills
- Customer-orientation
- Marketing and sales skills
- Administrative skills
- Experience
- Networking
- Social skills
- cognitive flexibility
- out-of-the-box thinking
- Good knowledge in your own specialization

Additional comments and suggestions:

"The education lacks orientation on problem-solving."
"The courses on entrepreneurship focus on the practical things and the business idea itself."
"The courses regarding entrepreneurship are very theory based."
 "The basic course on entrepreneurship for TSE students should be for everyone."

Ideas for educators: how to acquire needed skills through education

- More orientation on problem-solving
- Multidisciplinary team-working
- Learning how to work over organizational boundaries (with people from different disciplines, organizations, sectors and backgrounds)
- Enhance communication between different faculties
- Developing communication skills in different language systems (like different industries)
- You should push the students to think more by themselves
- Course about the basic things like laws and regulations, fundings etc.
- course in innovation related to your subject
- Freedom of choice in tasks and topics

Suggested tools or approaches for innovation and entrepreneurship learning:

- Design thinking tool (Boost mentioned)
- Double Diamond
- Diversity enhancing
- Interdisciplinary courses
- Work placements
- Work experience
- Real life exposure
- Project orientation
- Hands-on practical courses
- Portfolio type of learning
- Labs
- Games and simulations
- Pitching
- Bootcamps – start-up step-by-step
- global virtual teamwork
- Trial and error
- Maturing (related to trial and error)
- Voluntary work, such as JCI
- resource mobility
- opportunity creation
- Basic business knowledge
- Recognition of the student's value
- understanding your own value when working interdisciplinary
- understanding "hackathons for everybody, not just for business students"
- "nobody told me at the university that my knowledge is valuable"
- Entrepreneurs should come and keep the courses on entrepreneurship
- entrepreneurs coming to class sharing their experiences

Entrepreneurial institution

- "The studies and working life are very much separated from each other in Finland"
- "There are good plans at the university, but they haven't been applied"
- "could be improved by challenging old habits and encouraging students to think out of the box."

Additional comments and suggestions:

"I've done a lot of different things besides studies"

ENTREPRENEURSHIP AS A CAREER OPTION

Knowledge of the industry

- The university
- Volunteering
- Knowing the right people
- Work ("studies is a nice add to it")
- Work placements /internships
- Life in general
- media, literature
- online
- Networking events
- Company projects

Additional comments and suggestions:

"You need job experience to first get a job"

A career option

- "I have an innovative mind-set, I have these ideas as a hobby and I'm planning to establish a company in the future"
- "I don't feel entrepreneurial, but team work and brainstorming on classes has made me more oriented"
- "I don't know if I'm going to be an entrepreneur, but I have good entrepreneurial skills and I've been on a start-up booth"

Additional comments and suggestions:

"Usually successful entrepreneurs are 40+ with experience. Students should get to work in companies to get experience and to get to know people to get into the ecosystem of start-ups."

Skills through work practice

- soft skills, like presenting yourself
- data management skills
- entrepreneurial skills
- language skills
- connections
- theory into practice
- "is this something for me?"
- continuous skills development
- To develop: expertise on my own field
- judgement and decision making

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- Bigger role than now
- More well-designed courses
- Easier transition
- Towards problem-solving
- out of failure-thinking
- pushing into entrepreneurial mind-set
- gamification into connection with real life
- project-oriented
- technology will surely mix and speed things up. I feel that academia will have a lot to do in order to keep up. -> More openness, more collaboration.

Additional comments and suggestions:

"I guess there will be a greater and greater role for it, but I hope that would not be the biggest goal for the university studies. I appreciate science for its own sake and not just for the business. Innovation is very important too, but I believe you get better business and better society if science can work with its own goals as well without intervening too much. Innovation and science must listen each other as equals."

How to ensure the best entrepreneurial-oriented and innovative education

- More co-operation between faculties
- Interdisciplinary courses
- University-business relations
- Student organisations should be more entrepreneurship-oriented
- a system to produce language speaking confidence
- more practical experiences
- To start that from the very beginning of the education (kindergarten, primary school)
- Innovative way of thinking should be skill to use all the time
- Exposing students with "real life"

Additional comments and suggestions:
Not everybody should be or try to be an entrepreneur.
"There should be something that would help to rediscover yourself after graduation
   ➔ "who am I? Not a student anymore -> unemployed? No! Then what? (help with **Transition identity)**

Outcomes from the group discussions with companies, EuroNet

The validity of the results

The 2 entrepreneurs interviewed are:

- 1 Small and Medium Size entrepreneur working in a consultancy company as manager (following named as "SME manager")
- 1 small entrepreneur active in the handicraft and artistic products (following named as "Artisan")

The entrepreneurs were difficult to be involved and the interviews were planned several times and changed because of their personal engagements in other activities.

After the lack of replies in the written form, the interviews were carried out personally face-to-face in an oral way.

To facilitate the collection of the results, the survey was translated in Italian and also the replies were provided in the Italian language.

A short presentation was introduced personally by EURO-NET staff using the content of the form to introduce to the project and to show a graphic showing the triangle of investigation (Teachers – Students – Entrepreneurs).

The interviews were carried out only in oral form.

General findings

The students should be equipped with practical training and problem-solving skills. The education is not still ready to prepare the students with the real needs to be recruited. The interaction within the business and the learning contexts are weak and structured.

A strong need to educate the students for innovation and entrepreneurship is detected.

BUSINESS DEVELOPMENT

Skills for entrepreneurs – existing and needed

For both, the technical skills are necessary. Management skills are essential to survive in the market.

There is a need to develop soft skills not acquired during formal education about the capacity to deal with complex problems.

The work-based learning is also important because younger students need to analyse and face real difficulties.

For the SME manager, the skills are acquired from continuous and daily learning with the support of national news about legal, fiscal and administrative aspects – the National Order of Fiscal Consultant is providing some e-learning lessons to be attended with a minimum per year (5 topics).

For the artisan, the skills are acquired in using new tools, instruments and in looking on the web about new methodologies and materials.

For both, there are chances for continuous learning offered by the local Chamber of Commerce e.g. seminars for internationalisation or ICT improvements

Innovation in the business development

The innovation is considered important but not essential for the artisan that is used to work in traditional contexts, while it is essential for the SME manager operating in a context needing a continuous and daily update of knowledge.

The support would come from the ICT to develop the businesses e.g. as a marketplace for artisan, as innovation for the consultancy for SME manager.
The use of new software should be supported by technical training (e.g. Consultancy software) for all the staff working with it.
Important educational support could come from the Chamber of Commerce or the professional National Orders or National Artisan Confederation, mainly in terms of practical training opportunities or seminars/meeting about relevant topics (internationalisation, networking, collaborations).

UNIVERSITY-BUSINESS COLLABORATION

Collaboration with education providers and students

No experience for the artisan.

Previous experience for the SME manager as a speaker in a seminar about entrepreneurship at the University of Basilicata. The talks were about the opportunities coming from the regional funds to support the start-ups from a consultancy point of view.

It could be interesting to collaborate for both but for different reasons:

- Use and test of new materials for the artisan
- Supporting the start-ups and new enterprises coming out from student's after the completion of their studies (as potential new customers)

Challenges encountered

The education is not preparing the students for problem-solving and for real needs. This is affecting the real needs in the enterprises while they are recruiting, they are obliged to train on the job the future workers with a waste of time and resources.

The students should be prepared, in the opinion of the manager to be more independent and conscious about their potential.

Students' entrepreneurialism and innovativeness

The skills are the confidence, willingness to afford challenges, adaptability, problem-solving.

Usually, the students are not considered for recruitment, only after an onsite training, internship and anyway after detection of their ability and skills.

Threats and demand for change

The work-based learning experiences should be increased rather than only theoretical learning.

The threats are about the large efforts made in terms of time and resources to train future workers about skills useful in the job. Sometimes, those efforts are vanishing because of the lack of interest/willingness of the students or because he/she is moving to other sectors/activities.

Suggested tools or approaches for helping students

Help the students to have a more clear vision about their careers and support them with suggestions about the steps to have success.

The innovation is interesting and engaging if it is presented in ways different than the ones included in the books – the training from books should be supported by visual elements and activities where the students feel more active in the training.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Educational support needed for business development

Both are important and they are considered by both entrepreneurs are deeply connected each other.

The innovation mind-sets should be introduced all across the education starting from an early age.

The entrepreneurship training should be reinforce in last years of education to prepare the students for future challenges.

Outcomes from the group discussions with teachers, EuroNet

The validity of the results

The 5 teachers interviewed are from two stakeholders:

- 3 teachers from Studiodomino: a VET provider active both in Vocational Training and master course recognised by the Regional Government in Basilicata
- 2 teachers from Secondary school (lyceum):

The teachers from Studiodomino know each other but they were replying independently to the survey. To facilitate the collection of the results, the survey was translated in Italian and also the replies were provided in the Italian language.

A short presentation to the focus group was introduced personally by EURO-NET staff using the form itself, there is an introduction to the project with a graphic showing the triangle of investigation (Teachers – Students – Entrepreneurs).

The interviews were carried out in written form for the ones from Studiodomiono and in oral form (telephone) with secondary teachers.

General findings

The replies are different mainly because of the learning environment and of the professional skills of the teachers. In effect, a general finding would be possible by those elements as follows:

- VET teachers are calling for more work-based learning
- masterclasses (upper HEI) teachers are professionals and they are looking for problem-solving attitude and soft skills to be transferred to the students
- secondary teachers are obliged, in the last period, to be autonomous in their innovative and entrepreneurial learning and they are constantly looking for opportunities to get in contact with the enterprises

A general consideration should be related to the perception of the needs, for the educators to innovate the learning contexts in line with real needs for future jobs and entrepreneurship.

ENTREPRENEURSHIP AND INNOVATION IN TEACHING

Innovation in teaching

Thanks to a dynamic context, activating the participation in the lessons, investigating together real-cases, stimulating their interest for a more in-depth analysis, let the students choose a part of the topics to be learnt.

Additional comments and suggestions:

The VET teachers are perceiving as most important to let the students to be immersed in real cases, the secondary teachers are more focused on the innovation coming from problem-solving and autonomy in the decision.

Interaction with students thanks to digital tools, looking for the tools the students are using more (e.g. mobile phones, video tutorials). The secondary teachers that have replied in last days, in reality, are struggling with distance-learning with ICT tools – they have detected that the students are ready to use alternative tools e.g. e-learning, video lessons, training modules, online testing etc.

About the methodologies, it is clear for most of the teachers, especially for the ones working for private bodies (ref. Studiodomino), that the use of new tools is not enough to bring innovation in class, it is essential to detect their attention with active participation and by using an informal approach in the language and the attitudes.

Additional comments and suggestions:

The slides, training materials and books are not enough to bring innovation in the method.

Feedback

The secondary school system is collecting feedbacks via formal oral and written tests – a relevant change is coming this year after COVID-19 pandemic where the lessons are exclusively online and therefore, the teachers are experimenting novel ways to receive feedback from the students (e.g. online tests, video oral tests, online multiple-choice tests).

For VET sector and masterclasses (upper HEI) the feedback is embedded in the lessons with daily feedback from the students in the class.

Additional comments and suggestions:

Some teachers are conscious of their need for coaching skills in order to foster the group cohesion and the active participation of the students

Innovativeness and entrepreneurialism in teaching

The replies are very different and it depends on the subject and the educational environment.

For some of them is difficult because of the complexity of the subjects, for others is more about the topical aspects in line with real and actual situations.

Additional comments and suggestions:

One of the teachers (in marketing subject) has detected, as essential, the transfer of knowledge about soft skills in a less formal context.

ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

Students' entrepreneurialism and innovativeness

The grades are relatively high (average value 7.5) with lower levels for secondary students and about the innovative attitudes of some students.

It is considered important the topical and updated knowledge about the subject of the teachers.

Additional comments and suggestions:

Some teachers are considering important the use of ICT and networking with enterprises.

Support from workplace

For secondary school is mainly coming from an autonomous impulse that is evolving, in a more structured but still confused way, in last days because of COVID-19 effect.

The contact with the business is rare and in some cases very intensive masterclasses (upper HEI).

Additional comments and suggestions:

The teachers, especially in formal education, were obliged to be trained, enrich their curricula with ICT knowledge and the use of ICT tools in class.

Challenges encountered

The main challenge is the motivation for all the teachers.

Once the motivation is ensured, the rest of the process is quite natural.

Additional comments and suggestions:

Usually, the students are non-confident and are resistant to the sacrifices in the learning process, but thanks to alternative e-learning environments the confidence is increasing without relevant problems.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

It is fundamental also over 10 years. The innovation would lose its exceptional characteristic to become ordinary and essential.

How to ensure the best entrepreneurial-oriented and innovative education

The replies are various as follows:

- more and constant active participation of the students in work-based real cases
- mandatory continuous vocational training also for entrepreneurs
- a structured and daily contact of the entrepreneurs with the educational system

Outcomes from the group discussions with students, EuroNet

The validity of the results

The 8 students interviewed are from two stakeholders:

- 5 students from Studiodomino: a VET provider active both in Vocational Training and master course recognised by the Regional Government in Basilicata
- 1 student from a VET public school
- 2 students from a Secondary school (lyceum):

The students from Studiodomino are from vocational and masterclasses and they have replied independently to the survey. The same for the VET student, while the 2 students from the secondary school were interviewed during a call conference via Skype.

The students are equally distributed with 4 male and 4 females – the age is going from 18 to 25 years.

To facilitate the collection of the results, the survey was translated in Italian and also the replies were provided in the Italian language.

A short presentation to the focus group was introduced personally by EURO-NET staff using the form itself, there is an introduction to the project with a graphic showing the triangle of investigation (Teachers – Students – Entrepreneurs).

The interviews were carried out in written form for 6 students and oral form (Skype call conference) with secondary students.

General findings

The interviews let emerge a situation where the students are lacking a clear vision about their careers and with a strong need to learn from practical work-based learning contexts.

It is evident also that the self-entrepreneurship is not considered as an option mainly because of the self-confidence not stimulated in the formal education contexts.

ENTREPRENEURSHIP AND INNOVATION IN STUDIES
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Skills for entrepreneurs

Ability to manage, listen, work in a group, problem-solving, communication, technical knowledge, customer-orientation.

Additional comments and suggestions:

For some of the students, the main skill is rather an attitude: the curiosity.

Own entrepreneurialism

For most of the students, they consider themselves as innovative and interested in ICT but rarely entrepreneurial (only 2 on 8).

Additional comments and suggestions:

It seems that the students are low confident about their abilities to run an enterprise (especially the younger ones) and they are declaring a need for learning how to be innovative and become entrepreneurs.

Ideas for educators: how to acquire needed skills through education

The common situations are the school or universities difficulties. An added value is coming from work-based learning, work in group sessions, daily practical issues during the studies (e.g. living alone, struggling with expenses).

Additional comments and suggestions:

It is evident a lack of situations different from the school/university except for one case where the student declared also the importance of sport and activities in an association.

Needed skills

Management, real cases analysis, ICT, ability to decide, specific and technical competences.

Additional comments and suggestions:

One student has identified the power of the synergies coming from different specific and technical skills among other students/colleagues – it is relevant to become entrepreneurs together.

Suggested tools or approaches for innovation and entrepreneurship learning:

The tools and methods suggested are various:

-   Business cases analysis

- Interactive presentations
- Brainstorming
- Laboratories
- Work-based learning experiences

Additional comments and suggestions:

The need for real cases and engagement in practical business activities is a very important issue.

Entrepreneurial institution

The students in most cases are declaring that the institutions are innovative and that is more necessary to visit the business and being involved in real cases.

For younger students, the innovation is lower in formal education even if in last days, after COVID-19, there is an important change, even if the school system is not prepared at it.

Motivation to study

Improve the skills and knowledge to have more chances in the job market, follow the ICT evolution, have a multidisciplinary knowledge.

Additional comments and suggestions:

For one student, it is important the masterclass because it is more advanced than the academic degree and it is coming in a period of her personal lifetime when she feels more mature and conscious about the choices for better employment and career.

ENTREPRENEURSHIP AS A CAREER OPTION

Knowledge of the industry

After studies at different levels and personal curiosity (only for 2 of them).

A career option

Almost all the students are not considering the self-entrepreneurship as a possibility at the moment. For some of them, the decision could come only after the completion of studies.

Additional comments and suggestions:

During the face-to-face interviews, it appears that there is an evident lack of vision about the coming future in the job market in a context where the students are insecure about their abilities to face practical issues out of the technical skills acquired during their education.

Skills through work practice

Professional development, possibilities for a career, autonomy in organizing and managing own work, possibilities to apply creative abilities, human relations.

The skills that would like to be developed are the problem- solving and the work in group attitudes.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?
Both are considered as essential by all the students, for some of them, entrepreneurship and innovation are deeply connected.

How to ensure the best entrepreneurial-oriented and innovative education

Ability to have open minded students in an educational context more adaptive to the market needs and able to change itself in a continuously changing environment.

Additional comments and suggestions:

To develop the competencies and abilities for an entrepreneur to have an innovator role, able to introduce novel methods, working process and manage an enterprise continuously looking for.

Outcomes from the group discussions with companies, Succubus

Validity of the results

The interviewed companies are all dealing mostly with the digital economy at different levels of maturity. However, one of the interviewees is the director of a business incubator, therefore his feedback reflects this larger perspective than the entrepreneurs' one. All of them are based or have started their business in Nantes area and are expanding towards Paris but have larger ambitions.

The introduction to the CDTMOOC thematic and objectives has been provided by the use of the leaflet, email and a personal presentation.

General observations on discussion with companies:

All interviewees easily agreed on the fact that **Innovation is the essential building block** of their entrepreneurial adventure, its essence and its winning asset while facing competition. **Differentiation** is the common understanding about the impact brought by innovation.

All of them share also the view on what competences are needed for an entrepreneur: apart from **own domain-specific knowledge expertise**, all entrepreneurs need to be knowledgeable in **management**, **cash flow** and **accounting**, **finance** and **fund raising**, **marketing** and **sales**. However, all of these competences can be acquired and developed over time.

Lifelong learning is a necessity and is fuelled typically by participating in workshops, following MOOCs, performing a permanent technological watch-out. Other relevant sources are given by **networking** and trial and error, that is, **learning from own mistakes**. Therefore, what emerges is that a good mix of hard and soft skills is required. **Emerging necessities** will also drive the acquisition of new skills. The **level of maturity** of a company influences also the kind of competences to be developed. **Everyday practice** of entrepreneurial activities is the other key learning component for an entrepreneur.

Internship and use of intermittent workers are the ways students that have the potential to be hired are tested and taken on board. Usually the courses in marketing and entrepreneurship delivered by the interviewed entrepreneurs themselves at universities and academic institutions represent a way to reach prospect collaborators among the students. This way a fruitful collaboration with academic institutions can be started and sustained.

However, students taken on internships **lack of experience** on the field and need to be trained on the core technical skills and they need to develop the good reflexes too. The good side is that they bring in a **fresh new perspective and ideas** as well as their **up-to-date theoretical expertise**.

Most importantly students need to have the right **attitude** to become a potential new collaborator: 1) **adaptability**, 2) **ability to learn** and 3) **willingness to grow**.

Usually it is easier to get along with interns than with academic institutions since their objectives differ: the former look for a real opportunity to improve and test themselves in a real working environment, whilst the latter are just focussed on their business which means to **allocate all the student**s in different companies for their mandatory internships. However, also with some students there is the actual risk of **lack of motivation** once satisfied their need of finding an internship. This can be a real source of waste of time.

There is societal trend that fosters people to become independent from a salaried job more and more. Therefore, education has to follow this emerging need by **focussing on entrepreneurship and innovation** in a consistent way and by supporting students to develop their interest in these subjects in two ways: 1) by **fully involving students into long term-projects**, and, 2) by **integrating entrepreneurs in the faculty** body.

BUSINESS DEVELOPMENT

Skills for entrepreneurs – existing and needed

- Basic skills
  - ➔ Ability to learn
  - ➔ Curiosity
  - ➔ Own domain technical expertise
  - ➔ Learning from experience (from own mistakes)
- Skills that are necessary but that can be learned over time (**self-development** – MOOC; **practice**; external sources – **networking**, workshops, conferences, etc.)
  - ➔ Management
  - ➔ cash flow
  - ➔ accounting, finance
  - ➔ fund raising
  - ➔ marketing
  - ➔ sales

Innovation in the business development

- " That's all we do, we spend all our time generating new products and ideas. "
- "It's a very strong part, you have to be consistent and **differentiate** yourself from your competitors."

UNIVERSITY-BUSINESS COLLABORATION

Collaboration with education providers and students

- **Internship** and use of intermittent workers for testing potential new collaborators among students
- Entrepreneurs give courses in marketing and entrepreneurship at universities and academic institutions
- Such courses represent a way to reach prospect collaborators among the students.
- academic institutions need to provide internships to their students in real working environments.
- "Yes, historically we have often taken on interns and alternates who we then hire. It's a culture at home, we like it and we're interested in it. I have even taught courses at the CAF."

Challenges and opportunities encountered

- students taken on internships **lack of experience** on the field and need to be trained on the core technical skills
- students bring in a **fresh new perspective and ideas** as well as their **up-to-date theoretical expertise**.
- students need to have the right **attitude** to become a potential new collaborator: 1) **adaptability**, 2) **ability to learn** and 3) **willingness to grow**.
  - ➔ "Competency number 1 is adaptability, the ability to learn and change. Next comes technical expertise"
- During an internship, students usually look for a real opportunity to improve and test themselves in a real working environment
- However, some of them **lack of motivation** as they just want to satisfy their need of finding an internship.
- Another problem is given by the diverging interests of educational institutions and of companies, since the former just want to **allocate all the student**s in different companies for their mandatory internships.
  - ➔ "(educational) Institutions are focused on themselves and their business, they lack the ability to listen to the needs of students and entrepreneurs."

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Educational support needed for business development

- "I think it's working on their long-term vision with long term projects. They need to be involved in projects from A to Z."

- "a lot of people are already doing business projects, teachers are more often trainers and consultants. What would be nice is to have entrepreneurs give courses."

Role of entrepreneurship and innovation in education in the next 5 years?

- "I think it will be 20% of the skills taught. We're going to get people thinking. There will be less salaried work for more entrepreneurship because people will want to work for themselves or on several perimeters."
- "In my opinion this is fundamental, but there is an entrepreneurial injunction that is developing."

Outcomes from the group discussions with teachers, Succubus

Validity of the results

The interviewed teachers come from two different private institutions related to digital technology and arts: E-artsup is a well-established university network across France specialized in digital creativity and multimedia, whilst the Gaming Business School is a brand new school of management specifically addressed to the challenges and professions of video game and e-sport based in Lyon.

Teachers' core academic interests and teaching are particularly different, since one is involved in management techniques, whilst the other is a specialist of a particular design tool. Both teachers are familiar with entrepreneurship education but as a practice in their teaching rather than a specific part of their curricula.

The introduction to the CDTMOOC thematic and objectives has been provided by the use of the leaflet, email and a personal presentation.

General observations on discussion with teachers:

Despite the two teachers have to deal with two different kinds of students and teach two very different subjects, still they share a common approach: **active practice** through **role playing and use cases analysis** are considered key factors **to develop creativity and entrepreneurial spirit**. This is sought in the present implementation of their courses, but is taken for granted as a fundamental and more generalized **building block for the future** of education (and not necessarily on entrepreneurship as a domain) in the 5 to 10 years ahead.

Self-confidence, **curiosity** and **self-development** have to be cultivated and instilled in the students as well in order to foster not only entrepreneurial spirit but also a better way of adapting in an increasingly changing market landscape.

But **getting out of own comfort zone** is a basic requirement for the teachers themselves to keep their knowledge up-to-date and validated by practice.

Finally, **being exposed to different sources** of inspiration (conferences, networking, events, cultural and artistic material, and, of course, scientific literature) is important for both teachers and students, since the context can affect enormously the attitude towards innovation and undertaking new challenges.

ENTREPRENEURSHIP AND INNOVATION IN TEACHING

Innovation in teaching

- Role playing and use cases analysis to develop creativity and entrepreneurial spirit.
  - "I also organize my classes in the form of sprints"
- Knowing what has been done before is as important as what is up today.
- Design Thinking, Sprint Design, Agile methodologies and use cases have to be accompanied by general culture sources such as films, games in order to have a holistic view of what has brought us up to today and what are current basis for the future.
- In addition, being constantly up-to-date, participating to events and conferences and developing own networking capabilities, are absolutely fundamental to be prepared.
- The work setting can affect a lot the way one can be exposed to the improvement of own competences and knowledge. The more it offers opportunities to exchange, the more helpful is. However, own engagement and resourcefulness have to be personally sustained.
- Being challenged to test own methodologies and for doing this to develop a network of professional peers and entrepreneurs that can test, review and provide feedback is paramount.

Feedback

- Formally: Direct evaluation from students or educational managers.
- Informally, via dialogue and the students' implementation of the principles taught in the classroom.

ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

Students' entrepreneurialism and innovativeness

- Despite the knowledge of past cases and experiences and the digging into the scientific literature corpus are certainly useful to be informed and aware of lessons learnt, the experimental approach and role playing are certainly more effective in

raising interest in entrepreneurship as they leverage onto natural passion for the subject and the need of being independent.

- o "There are 2 variables that affect entrepreneurship: passion and the need for independence."
- Pragmatism and originality win (whether using role-playing or referring to scientific literature)

Challenges encountered

- Increase personal self-confidence in order to dare and get out of own comfort zone can be supported better by project-based learning, workshops and self-development.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- Students will be better prepared to face an ever and more quickly changing market landscape.
- New forms of education will emerge as well.

How to ensure the best entrepreneurial-oriented and innovative education

- A better integration in the formal educational activities would be needed:
  - ➔ companies should be more active in the formal education,
  - ➔ students should be invited / allowed to start and bring on simulated and real entrepreneurial endeavours,
  - ➔ students should tap more into resources to increase their background knowledge.

Outcomes from the group discussions with students, Succubus

Validity of the results

The students contacted for this survey have different levels of experience and follow different curricula at university level varying from a specific technical cursus in UX, to communication, to business administration.

Their perception about the subject on entrepreneurship and innovation varies accordingly, from whom that has not experimented a lot and is aware of the need of filling knowledge gaps before daring anything independently, to whom considering herself already innovative but not much

interested in starting an entrepreneurial activity in the short term, up to whom that has already proved oneself on the field and succeeded.

The introduction to the CDTMOOC thematic and objectives has been provided by the use of the leaflet, email and a personal presentation.

General observations on discussion with students:

There is a different self-perception about the personal level of entrepreneurial spirit and of the attitude to innovate depending on the **experiences** and possibly also on the level of maturity in such young people. Both aspects are greatly impacted by the level of **self-confidence** acquired so far. In any case the two concepts are clearly understood.

According to the students, **a vast and varied range of competences is necessary** to become a good entrepreneur. A good mix of **managerial** (empowering and delegation, strategy, quality) and **business** skills have to be necessarily complemented by a solid set of **soft skills** (collaboration, networking, communication, team building, negotiation, leadership) and attitudes (being rigorous) is needed. But in particular two **mind-sets** can really make the difference: **curiosity** and **service**. The first one is the driver of innovation and of attracting the right people to collaborate with. The second one is the driver of the commercial success.

Networking and any personal working experiences have largely contributed to start developing the necessary competences to become entrepreneurs. In the most fortunate case also the school provided the good settings for this

In general, the students would like the educational institutions to help them in f**illing up the knowledge gaps** they think to have, in particular in relation with their specific curricula that cannot cover all the skills that they identified. Noticeably, there is also who would like to be helped in developing more a **better understanding of the self**, in order to know own forces and weaknesses, as well as learning how to interrelate with other people, being these fundamental assets to be an entrepreneur. A change in culture is also requested, in particular for what concerns the perception of **failure as a learning experience** rather than a blocking obstacle. Finally, a **closer relation with the market** and the real business world is important to get the right perception of **own value**.

Serious games and **project-based learning** are certainly useful tools that can be Implemented in order to step ahead, but what would make the real difference to grow own entrepreneurial spirit and capacities is given by a **direct contact with entrepreneurs**. In that case, **workshops**, **conferences**, but most of all, **mentoring** and **tutoring** would represent the real change maker to improve.

There is generally a good perception about the level of innovation and entrepreneurialism of the educational institution, but this might vary, in particular for whet concerns the innovativeness, according to the different cases.

The main driver is given by the desire **to learn more** and, at the same time, to be better prepared and having **better chances for a professional career**.

Knowledge of the sector has been mostly developed through the educational environment and then reinforced through personal experiences.

Becoming an entrepreneur in the short term in not necessarily a must for the interviewed students. However, this depends also by the kind of curriculum they are following: a UX designer is certainly keen in starting a freelance career rather than students in business and communication studies that prefer to accumulate experience before deciding to become independent consultant or even entrepreneurs. In any case the challenges that are related to start an entrepreneurial endeavour are considered and evaluated, including the **work vs private life balance**.

When confronted to the search of a job or of an internship, there is generally a good attitude to keep the door open not only **to get in depth on the core competences** of the professional domain but also **to learn new skills**. However, the employment should not be too far from the core interests.

The students have a **positive perception about the future of educating on entrepreneurship and innovation in the future**. This would be an important lever to the **emergence of new start-ups** and would be particularly effective in domains at high technological Impact like engineering. However, it would be better whether these topics would be introduced in the educational system **at an earlier stage** as it happens in other countries (with the use of role playing in kindergartens and primary schools).

There is not a one solution fits all to get a better education on entrepreneurship and innovation. A mix of **new learning platforms**, **project-based learning** along with a greater involvement of **experienced entrepreneurs** and the provision of **better tools** to better knowing the self would certainly contribute to this goal.

ENTREPRENEURSHIP AND INNOVATION IN STUDIES

Skills for entrepreneurs

- Management skills
  - ➔ Empowering,
  - ➔ Delegating,
  - ➔ Strategy
- Business skills
  - ➔ Marketing
  - ➔ Sales
- Soft Skills
  - ➔ Collaboration,
  - ➔ Networking,
  - ➔ Communication,
  - ➔ Team building,
  - ➔ Negotiation,
  - ➔ Leadership,

- Interpersonal skills,
- Organization
- Attitudes / personal qualities
  - Being rigorous
- Mind-set
  - Curiosity
  - Service

Additional comments and suggestions:

"Have a sense of service because it will impact the network and customers."

"Organization is also important, knowing how to delegate, having good leadership, knowing how to surround yourself with the right skills to do what I don't know how to do."

"Curiosity. Knowing how to look for information. This is very important, it allows you to keep an eye on things and to acquire knowledge and experience."

"The social aspect must also be developed: knowing how to make relationships and play with them. This also requires qualities and interpersonal skills."

"Being rigorous is also important and intimately linked, it is necessary to know how to work and communicate with people with quality content."

Ideas for educators: how to acquire needed skills through education

- Filling up the knowledge gaps they think to have, in particular in relation with their specific curricula that cannot cover all the skills that they identified.
  - "I have skills in legal and financial management. I'm interested in engineering but it's complicated to acquire as a skill because I'm in business school."
  - "Having an eye on the market, we are not taught enough to value our skills with companies and to situate our skills and their value on the market."
  - "To have a different view of failure. I like the American model which shows that failure is not an end but a springboard."
  - "Self-development, knowing who I am in life, understanding oneself, it allows you to better understand people and life and thus everyone's experiences and ideas."

Suggested tools or approaches for innovation and entrepreneurship learning:

- Serious games,
- project-based learning,
- workshops,
- conferences,
- mentoring,

- tutoring
- work placements
- work experience

Additional comments and suggestions:

> "Coaching and advice to develop one's ideas would be interesting, as with the Entrepreneurship Network for example."

> "I would like teachers to organize meetings between entrepreneurs and students, and conferences on entrepreneurship themes."

> "This can also be done through innovative tools such as serious games or interactive works/projects. »

Entrepreneurial institution

- "I find that my school is receptive and for me this is an innovation because you don't find this in every school. The school could improve in terms of work rhythm (2 days at school, 3 days in the company), but school days are in the middle of the week and this can cut off projects in the company and it blocks the creative and entrepreneurial process."
- "The institution where I am studying is entrepreneurial and innovative because it helps students through its courses and its various professional interventions to build the knowledge and skills needed for the future as an entrepreneur."
- "Entrepreneurial yes, innovative not necessarily. It could improve by giving courses on new technologies and new market practices, as well as on accounting."

ENTREPRENEURSHIP AS A CAREER OPTION

Knowledge of the industry

- Educational system
    - ➜ Secondary School
    - ➜ University
- Working experiences
- Internships
- Family interests and know-how
- Curiosity (online searches)

A career option

- It depends on the curriculum
    - ➜ Optional for business / management and communication studies
    - ➜ A natural outcome for professional / vocational studies
- "Yes I want to start freelancing sometime after my degree (3 to 5 years later, less if I have an interesting opportunity)."
- "I lack the management skills to manage my time and my activity."
- "I would need a personal room, or a dedicated room to concentrate and separate my private and professional life."
- "Another very important thing is to have some money saved, because you can find yourself without a job overnight as a freelancer, to secure yourself."
- "I don't feel entrepreneurial, but team work and brainstorming on classes has made me more oriented"

Skills through work practice

- Core competences,
- soft skills,
- new skills (in other departments, etc.)
- "I am looking for assignments to develop the skills I am applying for, but also to broaden my knowledge. I wish to develop my business expert skills, my interpersonal skills, my leadership. I also want to learn new skills from other departments or services."

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- Better teaching
- Better opportunities to learn
- More impactful in society
- Engineers will benefit more than all
- They should be taught earlier

Additional comments and suggestions:

"If I had been taught to start earlier, I probably would have started my business by now. Entrepreneurship should develop much earlier, like in kindergarten in some countries with role-playing. It's very cool and interesting. We need to change the taboos in France around money."

"I think that in 5 years, students will be well trained in entrepreneurship and who knows, maybe many of them will want to create their own business no matter what their field of activity."

"I think that this will develop in very specific fields, such as engineering. Moreover, we can see that start-ups also have the opportunity to innovate."

How to ensure the best entrepreneurial-oriented and innovative education

- not one solution fits all,
- new learning platforms,
- project-based learning,
- greater involvement of experienced entrepreneurs,
- better tools to better knowing the self

Annex 5 – Findings from Art Square Lab, Luxembourg

Outcomes from the group discussions with companies, Art Square Lab

Validity of the results

We managed to bring together new entrepreneurs as well as mature entrepreneurs from bigger companies as well as the intrapreneurs in corporations like bank. We reached out to them by personal contacts knowing that they might bring a valuable input to the conversation.
The entrepreneurs were invited for a focus group to Art Square Lab office, we have used the PP and flyers of the project.

General findings

An important part of the conversation (and the reason why we could not follow the questions) was the common understanding of entrepreneurship: is the horizontal skillset or ability to set up and manage own business. If this is a skillset, than in the point of view of the larger companies the discussion also should focus around intrapreneurship that they actively promote inside their workplaces (e.g. by developing entrepreneurial programs for employees, who in turn might create a spin-off inside the company.

BUSINESS DEVELOPMENT

Skills for entrepreneurs – existing and needed

- <u>About hard skills</u>, participants shared that they are more easily learned than soft ones. Some might vary depending on the activity, as for instance communication skills might be more important in a selling activity than an IT one, which involve less contact with customers. The skills needed might also vary if the entrepreneur is new to it or experienced. For some participants it is important to have basic knowledge of various fields as **accounting, finance, tax law, and marketing**, considering that numerous entrepreneurs create a one or two people company. In some participants' point of view **organizational skills** are needed, notably to acquire some self-discipline, as **methodologies and concrete tools** to reduce the risk of failure (business canvas, lean methodology…). **Negotiation skills** have also been mentioned as **communication skills**, the ability to **sell oneself**, be **one's enterprise ambassador** and to **build your ecosystem**, to **connect with peers** through social media (Instagram story for instance) etc. Having knowledge of **existing IT** as developing a **technological watch**, and being able to **combine this knowledge with creativity** is perceived as important as well.

- <u>About soft skills</u>, **attitude and mind-set** were discussed extensively. From the discussion it appeared that intrapreneurship is very important, as entrepreneurship, and that the entrepreneurial mind-set may express itself as an entrepreneur or as an employee, part of a company. As for this mind-set numerous skills have been mentioned. An **attitude toward failing** is important, to not fear it too much, rather accept it as a part of the process and that it brings meaningful information in order to move forward. The participants mentioned the need to develop entrepreneurs' ability to **deal with change on an everyday base, be flexible and adaptable**, and learn how to fail quickly at cheap cost through the **lean start up methodology**. It was also mentioned that entrepreneurs in the early developments of their projects should stay **open-minded** to the fact that their idea might need to change and evolve considering the market. **Curiosity** has also been mentioned, entrepreneurs should explore beyond one's industry. **Leadership** has been mentioned: being genuinely interested in people, being human-centered, being interested in problems and opportunity driven, being aware of the potential of others and being able to leverage the group effect, to connect and exchange with others, to give room for reflection. Entrepreneurs should **be proactive,** make things happen (**hand-on attitude**) and be **bold**. **Creativity** was also listed as a skill that entrepreneurs need. It was mentioned that some programs in big companies which aim at creativity involve applying new pieces of knowledge to current processes. For the participants, entrepreneurs should develop theirs **learning skills and continuously learn**. Reading books, watching movies, being mentored, listen to testimonials (and failures) of successful entrepreneurs, going to conferences and workshops, have been mentioned as ways to develop one's entrepreneurial mind-set.

Innovation in the business development

- One of the participants is a coach in an important banking group in Luxembourg. He mentioned that the banking sector will be disrupted in the 5 years to come by technology, and that there is no way to know how. Hence, a positive attitude toward change and innovation play an important role in the company's culture and are enhanced through numerous initiatives (innovation/boot camps, design thinking academies, innovation labs, scooting and venturing in the fin-tech market, coaching through a method combining design thinking, lean start-up and agile philosophy…). For this participant the individual in the company should have an entrepreneurial mind-set, but the company, through its culture should support the individual, in order to allow innovation to happen.

Collaboration with education providers and students

- A participant mentioned being a speaker in educational events in Luxembourg through the (CcLux) Luxembourgish Chambre de commerce's special initiative called "Relation-Ecole-Entreprise"(REE). As a part of this initiative the participant goes to high schools and universities in Luxembourg in order to talk about entrepreneurship, business creation, opportunities of becoming entrepreneur as well as: Why to become one, how to start "risk-free" and what exact project the students could start with. These sessions take between 2 to 4 hours per class and are held approximately 1 or 2 times per week, before 20 to 90 students. Besides often the students come to the Cclux or House of Entrepreneurship (HoE) for a workshop [Editor's note: the House of Entrepreneurship is a department of the Cclux]. Sometimes conferences are organized with approximately 120 students, where the director of the Cclux comes or even an established entrepreneur, talking about his experiences. Beside the Cclux, the participant mentioned the association "Jonk Entrepreneuren Luxembourg asbl" (JEL) which organizes and offers different programs in order to introduce youngster to entrepreneurship and to open their horizons in domains of project management, innovation and, as said, entrepreneurship. They offer real and accredited school programs during one or more years (mini-company, young enterprise project, ma premiere entreprise, etc.) but also punctual workshops and sessions like the innovation camps (1 day) or job shadow days (1 day) etc.. One of the programs is as well the "Fit For Life" program (6 hours of class teaching about salaries, insurances, loans, debt, etc..), which is held in the classrooms of the students often between 14 and 17 years old. This is one of the programs, the Cclux participates as well, besides its own REE sessions. The JA Alumni is a program of the JEL, where participants of Jel-programs can become a member of the alumni and be part of a network of young active people. JA alumni organizes exclusive conferences all around Europe.

- Finally, HoE and Cclux are partners of the Uni.lu Incubator. Two of the participants in this context offer coaching and trainings to their start-ups.

Students' entrepreneurialism and innovativeness

- for some participants reducing the fear of failure and creating some psychological safety are very important. To answer the questions of why and how becoming an entrepreneur, as "what to do", helps. Explaining what is entrepreneurship, what qualities are needed, combined with hard skills, tools and methods to be used to start. It was also pointed out that coaching and mentoring are important and should be combined with theory, and that the students might need someone able to answer their questions through their evolution as entrepreneur in the making.

Challenges encountered

- openness of the company for entrepreneurial mind-set and trail/errors of the employees; the sandbox space where ideas can be tested, where prototyping can happen and where there is no punishment for mistakes. For example in one bank there is a program for young graduates/last years students who can work flexibly in various projects and are expected to bring an interesting input and more innovation. They are welcomed to make more mistakes than other employees and they are often offer the job afterwards.

Threats and demand for change

- if education will not change to train more future competence of the students and let them research, ideate, prototype and test - the students will have a very little chance to develop new skillset needed for the jobs of the future. More project oriented work related to reality is needed.

- Luxembourg specifically would like to have the label of "start-up nation" but most of the small companies are imported to the country and the local mind-set (high risk aversion) promotes wide employment in public sector and secure work career, with very little risk.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Educational support needed for business development

- It was added that having experienced entrepreneurs sharing their failures would be a powerful tool to create this psychological safety. Moreover, to a participant, entrepreneurship is not new, hence what students need to know is what it means to be an entrepreneur today.

- For a participant there are 2 types of potential entrepreneurs: the first one has a vision and should stick to it, believe in it. The other one is learning how becoming an entrepreneur, and to do it a good way would be by experimentation and a small steps approach: the potential entrepreneur shall start a small project (as an event for instance) with a clear output, learn by doing and go bigger. This experience being a good way of learning how one's manages, how one is acting and reacting in the context of a project. The participants share the idea that learning by doing is important when it comes to entrepreneurship. They propose the use of visual examples of the steps behind creating a business project.

Role of entrepreneurship and innovation in education in the next 5 years?

- it will become a "must" for the companies to employ people with entrepreneurial mind-set, also those who have already experience with running a start-up (even if they learned from own errors).

- as mentioned above the innovation in education is generally welcomed but must be connected to the needs of the market, flexible, promoting life-long learning. As the trends for 2020 say (Wired magazine) maybe in the future our study time will be dispatched in various moments of pour professional life more naturally.

Outcomes from the group discussions with teachers, Art Square Lab

Validity of the results

The teachers were recruited by mobilisation of contacts in the educational sector in Luxembourg: at schools, university and educational initiatives. In result 7 university teachers and one secondary school (Ecole De Commerce et de Gestion) teacher were present. All of them were selected based on their interest or link to the entrepreneurial education (either as research topic or direct work with the students on this topic).

Power Point with the questions was projected.

General findings

Generally the participants agreed that there is a shift in teaching entrepreneurship towards a horizontal skill-set that allows students to put ideas into actions (not necessarily to start the business). It is now one of the future competences and cannot be taught only at school- needs to be completed by life skills, practice, cross-sectorial experiences.

ENTREPRENEURSHIP AND INNOVATION IN TEACHING

Innovation in teaching

- One participant who teaches design do it through an industry project in which students using design tools develop an understanding of the problems, of clear barriers, and in a short time frame develop solutions. The idea is to foster students' entrepreneurial skills by doing, supported by a theoretical background. In addition to learning by doing, another participant mentioned the study in detail of key examples in order to see how other entrepreneurs have done, what risk had to be taken, in order to succeed. Thus, hearing testimonials is very powerful to help students being

less risk-averse. Also spending a lot of time on prototyping skills allows the students to see a way of reducing risk, managing risk. The participants also help the students realize that they are more imaginative, more creative, than they give themselves credit for, and those moments of self-awareness are important in the journey to an entrepreneurial mind-set.

- A participant mentioned that an entrepreneur needs a range of experiences. And for many participants learning by doing is the best way to transfer a bit of an entrepreneurial mind-set. It is also transferred to students through a lot of team work.

- The participants mentioned that they take quite a bit of time at the start of their course for a personality awareness process. From their point of view, students need to know who and what they are. Trough personality tests they help them assess their propensities (their risk propensity v. risk aversion notably) and short-comings, and give them a vision of how their brains work. Students are given a number of creativity tasks using classic design tools in order to realize that they are more creative than they think they are. Students are also given tools to be able to assess if their ideas and decisions as entrepreneurs are desirable, sustainable and doable. Another tool mentioned is a cultural platform for students to experiment and fail. As they are being highly challenged in a safe space, this tool allows to unlock creativity. Another tool used is the abstraction layering.

Additional comments and suggestions:

It was essential to start with the explanation of the definition of entrepreneurship as it turned out that there might be a difference in understanding of the term. The participants started by defining what "entrepreneurship" means to them:

The ability to seek new opportunities that have not been encountered before, to challenge the status quo, do something new, to be outside of your comfort zone, to be empathetic. A participant mentioned interdisciplinary centres in which entrepreneurship means being able to make new connexions between knowledge, information and people. An entrepreneur is also seen as someone who is solution-driven, and have a long-term vision, who is a visionary as someone who as the ability to imagine something that doesn't already exist, something that might even been seen as "crazy".

For another participant it is the ability to become creative in order to achieve one's goals and dreams despite resources boundaries. It is a combination of vision and conviction (usually people might have one out of two) for another one. For all it is a disposition, a mind-set, which comes from embodied characteristics in one's character as imaginativeness and lacking the common risk/lost aversion. These embodied characteristics, part of one's personality. It is explained by a participant that this mind-set comes from patterns developed in one's brain in early childhood. And if these haven't been developed, they take time to be unlocked and need to be reinforced over a long time: "it takes time to rewire the brain so that one becomes less risk-averse and more imaginative". However, from this postulate, the participants try to transfer innovative and entrepreneurial mind-set to their students.

Feedback

- Teachers are soliciting feedbacks at multiple times, through informal conversations, for instance after class. Moreover, at the end of the course cycle the teacher give a form to the students, this feedback is for the teacher only. Finally students have an opportunity to give a formal feedback which goes through the university channels. Teachers also often receive emails after the course of students about the use they made of their learned skills, for instance if they implemented it in their company.

ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

Students' entrepreneurialism and innovativeness

- Some participants, teaching in a private university, specified that because of the Design and entrepreneurial brand of the university, it attracts more entrepreneurial students than average, students who want to do a MBA and have with big dreams. But even considering this they consider that they could be a lot more entrepreneurial and innovative if they had started learning these skills at school instead of at the university level.

- For other participants, in public university and schools in Luxembourg, all students are in some way entre/intrapreneurial when they are involved in a course where they learn by doing. The students are found very motivated and liking these programs. The participant would evaluate that 7 to 10% of students are in fact entre/intrapreneurs.

- A participant listed initiatives in the Luxembourgish University that support entrepreneurship/innovation: they target all the students at the university, and try to give them an entrepreneurial/intrapreneurial mind-set (leadership skills, negotiation skill, pitch skills, selling skill) though for instance: hackathons, innovation camps, ideation camps, entrepreneurship course with a high practical side, a special PhD path, summer school for one week with PhD students and researchers with service de la Jeunesse, specific events as workshops with special speakers from the MIT entrepreneurship centre. It's been mentioned the tight relationships between the University and the Cclux and the HoE in educational programs and events with exchange of human support for instance.

- Another participant mentioned challenges proposed by external partners to their 16-17 years-old students. They then have to analyse the problems, find solutions and present them. The small enterprise program has also been mentioned. There is also another program offered to BTS students which is a competition in which they have to develop a business idea and create a business plan. Some young students also do

a week internship which give them a first contact with the business field. A 4 months internship is also included in the curriculum of university students

Challenges encountered

- As for the participants teaching in private universities, they find that they receive a lot of support from their workplace. Hence, the teachers are invited to use their own connexions, however in case of lack thereof, the university will mobilizes its scholarship and provide partners. The university supports also the overall course development. Generally, the participants find that the university puts a lot of value in its students' outstanding experience, and is prepared to invest in it. An example was provided with a course in collaboration with a hospital, in which students were invited to redesign a process. They led interviews with patients, analysed patients' journey and redesign it, and fully developed solutions. Wishing to implement those solutions the hospital asked if the university would collaborate with them one more semester on the implementation of the solutions. Even in this unprecedented situation, the university supported the project and created the law structure to make it happen

- As the main challenges, the participants mentioned that they find the students to be stuck in the past, to have issues around their ego and defence mechanism. They find that a key barrier difficult to break is around failure and what it means for their identity, they have difficulties seeing failure as a step toward success. The risk-aversion barrier has been mentioned several times by the participants.

- A participant noted that the majority of students doesn't have an accurate vision of the job market today and what awaits ahead of them, most of them think that they will find a job at the end of their studies and will stay at the same company for the next 40 years, and that vision of a linear career-path is not accurate anymore.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- For a participant, we will witness big steps in every direction, particularly in computer technologies. But also around power, political affairs, and we will witness an economical shift as a social shift. An important question will be how much we can take in from various information sources, retain it and make novel connections between things, unconnected and disparate information. Hence a critical way of thinking, an innovative mind-set will be important skills in order to be well-equipped no matter what direction the future goes.

- For another participant the students will need to have more awareness, to be psychological more advanced, to know who they are and be advanced human being with high moral standards in order to change the world. For this participant future entrepreneurs will have an impact, on other people, on their environment, and their education should help them be aware of that fact, to have consideration on their behaviours and decisions. To this participant education should help bring more entrepreneurs that think more holistically, systemically and sustainably, than selfishly. For other participants, students could be made aware of the fact that being an entre/intrapreneur is a way to have an impact, to act on things that matter.

- Another participant, mentioned that students should be made aware of the down side of being an entrepreneur. That is could be difficult to maintain a balanced way of life, that many entrepreneurs are obsess with their entrepreneurial activities and have trouble making time for other things (friends, family, an healthy life style…).

How to ensure the best entrepreneurial-oriented and innovative education

- The right attitude from teachers has been cited as a way to make the students experienced notions like co-creation, collaboration and the right attitude toward failure. Hence instead of being in a very top-down pedagogy, in which the teacher is supposed to know everything, and the students have to navigate by themselves, the teacher can demonstrate co-creation and the right attitude toward failure. Therefore a puzzling question from a student can become the perfect opportunity to embark the class-room on a journey to find the answer together, the teacher being comfortable with not knowing.

Outcomes from the group discussions with students, Art Square Lab

Validity of the results

The students were invited by the partner school of business and management who is interested to become associated partners of the project. One of the subjects taught is Entrepreneurship and therefore the school management decided to collaborate with us on this focus group.

Process of the discussion: supporting tools (e.g. PowerPoint, drawings, etc.)

The PP was planned but at the end the room at school was not properly equipped.

ENTREPRENEURSHIP AND INNOVATION IN STUDIES

Skills for entrepreneurs

Mainly students connect entrepreneurship with responsibility and innovation. They consider that part of entrepreneurship is to take decisions and be responsible for them. Creativity is also an important part of entrepreneurship, how to come up with new ideas, respond to the needs of users, create new solutions that already don't exist.

- I like to take responsibilities, to make decisions for one group of people. It means a lot for an entrepreneurial mind-set, it is really important to make decisions and take responsibility for it.

- I like working for myself, to do it alone, not putting work to someone else, even if it fails, I like to take responsibility.

- Need to be independent, taking decisions.

- I am the kind of person who likes to make decisions. For example, when we have group work I feel comfortable to make decisions, if they are not too sure, I am making decisions.

- I think that many young people have a problem to step out, to make decisions, to develop their own ideas. Better stay behind them.

- For me to be innovative it is probably the most important,

- I would like to set up my own company also, but first need to finish school and get some capital.

- I think that I am also a very creative person, I like to create new things. I would also like to have my new shop. I have an idea, but not concrete. I come here to learn more, to listen to other people, and get inspired.

- I also would like to have my own shop, but already people are using this idea. I need to find some more innovative ideas, because it wouldn't work. It is a little bit risky at the moment.

Additional comments and suggestions:

The students would like to learn negotiation and modern approach in business like agile, design thinking, students mentioned also creativity. They are afraid that knowledge they get in school is not updated. They would like to learn also in a different way, also the way they learn, they mentioned that through collaboration and peer learning they could learn more. They would like to avoid silos, which already exist in school (specialisations) and mixed students to share different skills and competences and collaborate on some projects. Another important skill is how to build a network, where to find potential partners, develop ideas, build companies.

It's like Brandon said, negotiation. The world is open.

I found school is pretty good, about sales is good.

I would like more recent approaches, about products, like this mooc in school. Updated knowledge.

Maybe … There are 3 different sections. But we should cooperate, do projects together. I have more skills in marketing, but I need people from another section. Would be great to learn from each other. You have other competences and skills.

Breaking the silos!

It would be interesting to mix sections, to do some projects together.

Not only my class, I was pretty stacked with my team…

It will help you for the future, create synergies.

It is also about networking too. It is also to learn. To build a team.

ENTREPRENEURSHIP AS A CAREER OPTION

A career option

Some of the students were already entrepreneurs, having their first business, others were involved in the business of their parents. Almost all of them see the possibility of opening the business in the future (as they study in Business and Management School).

Needed skills to be an entrepreneur

For most of the interviewed students managing problems, problem solving is a key competence. Also how to respond towards changing markets and being adaptive. They mentioned two types of competences: soft skills like leadership, negotiation, self-confident, risk management, but also hard competences like numbers, managing budget, production of specific things you are dealing with, etc. One of the important competences/skills was curiosity, and being able to put yourself in the shoes of customers.

- You have to be self-sure, self-confident, deal with problems. When you run company you have a lot of problems,

- You need to be an adaptive, good sales person.

- Leadership, charisma, the numbers, you need to know the numbers, marketing

- Don't be afraid to take risks. You can learn from mistakes from others,

- To create a company you need a lot of money. At the beginning it is quite complicated to get this money when you are a young person.

- You need to be curious, be open, search, have orientation what is existing,

- Be able to put yourself in the head of customer to see if your product is good, or if the app will be used,

Skills through work practice

Main points mentioned by students about getting entrepreneurial competencies was practical approach. Generally speaking, they like to learn by doing. It could be their own project, school project or internship, but they found out that for them the best way of learning is by doing, to have experience.

- During stage in company. It is the best way to learn.

- You should do your own project, even if it is on Instagram. Try to build a website, sell one item. I think that you can learn more by failing than in school. You need to try, you will learn. Learn from the mistakes

The most important thing for students is the possibility to learn, to be involved in concrete projects, get tasks and learn by doing things. Few of them mentioned that unfortunately stages (internship) are not so efficient, because usually you are not involved in any concrete project and don't get tasks which are connected to your education (mostly it is administration job, or support). But one of the students mentioned that at this stage it is a great opportunity to observe, to learn how the boss is managing the team, how people solve problems.

 "I have a student job. I work every week for them. I learn a lot. It is just a clothes shop. I don't like simple students, I need to do a job like others. I learn a lot, how to make a stock, how to talk with people, check out, operate with cash, open and close. And also the bigger thing I learned is to think like a customer. I need to go to customers, ask if they need help, guide them. If someone says no, you feel rejected, but you continue. This helps me a lot! Stage is important, the student job is really constructive!"

Stage is important to observe, how people behave, what boss is doing, how he/she is managing.

I would observe people how they are happy. How the boss treats people. I will learn from this. It is interesting to observe.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

How to ensure the best entrepreneurial-oriented and innovative education

All of the students interviewed were happy with the school program and tools. They mentioned a few programs which are good examples of a learning approach (Jonk entrepreneur program with NGO, where they could work on their own project). They really appreciate working on concrete projects, to have a challenge which they can solve. Few of the students mentioned competition as one of the motivators. Also cooperation with external partners was mentioned as an important part of learning (programs from NGOs, presentation in the front of people from outside of school, collaboration with external players).

I think schools are doing it. Commerce and management, you have to be open to people, you have to talk, do presentations, work with a lot of people, and change groups. It is like a work life. It is a lot of teamwork

I think Jonk Entrepreneur project was great was more concrete, practical

The competition was nice too, team work. To work on something concrete, not only theoretical.

You need help from others, to reach out, to call people. You see more of the business world. In school you follow mostly students.

In my section a lot. I had to create a 50 anniversary project, I was calling people etc. It was not for real, but was a lot of stress and fun.

It was teamwork, 6 people working on it.

It will be in the entrance of ecg, there will be open concerts, events for children.

I had a lot of contacts out of schools

Presentation for people from out of the school. We are making a presentation about how you calculate revenue, and you have to present for people from out of the school. It can help you to get confidence also.

Additional comments and suggestions:

As a main resource of knowledge they mentioned the internet. Specifically a lot of them search for knowledge, information on social media, and YouTube. They see movies, clips, videos as more interactive. Important for them is also a community, where they can exchange and share knowledge (few people mentioned Facebook group). Some of them mentioned also parents as a role play from whom they learned a lot, they are observing, sometimes also they are encouraged by parents to set up own business.

Outcomes from the group discussions with companies, MSS

Validity of the results

Vísir: One of the biggest fish companies in Iceland who are leaders in entrepreneurship in technic in the production and product development. Their goal is to use 100% of the fish they are catching and finding new products from the waste.

Yarm: Entrepreneur who was interested to make and create handcraft form Icelandic wool from scratch. Now she is selling her products worldwide.

Hjá Höllu: The company was made from an idea of a woman who was taking care of her young children at home. She was very interested in healthy food and started in her own kitchen to cook and sell to companies. Today she has two restaurants and is selling thousands of meals per day to companies.

Blue Lagoon: One of 25 wonders of the world. About 400.000 tourists (80) % to Iceland visit the Blue Lagoon. There are Spa's, restaurants and high class hotel. Also they produce a lot of products for skin care. They have a department where specialists are working on product development.

Hreyfisport: Gym and rehabilitation with focus on personal treatment and support. Also the companies are selling some equipment and products to support good health.

RATA: Supporting Start-up companies - entrepreneurs as a mentor to take steps forward and build successful companies.

These companies were chosen because they are good examples of good practice and show how one idea can become a big and successful business. Also because they are very different and give insight to the working environment in Sudurnes in Iceland.

The companies were visited one by one from the two Icelandic members of the project. We had some discussion for about one hour with the managers. The companies are located in Reykjanesbær and Grindavík.

The managers were informed about the CDTMOOC project, the purpose and outcome. We had an interview frame in English and in Icelandic and the interview was based on the frame. One was leading the conversations and one was writing notes from the interview.

BUSINESS DEVELOPMENT

Skills for entrepreneurs – existing and needed

- open minded
- the ability to work in a team

- be able to listen to others

- being able to set some goals and follow them

- time

- patient and power to research

- flexibility

- to be able to follow time schedule

- organized

- resilience

- passion

- hungry for new knowledge

- critical and creative thinking

Additional comments and suggestions:

Passion for the project is everything if you are expecting good results.

Listen and learn from people who have experience and knowledge you don't have.

To build a strong network is very important for success.

Innovation in the business development

- Give people time and space

- New product

- Support and motivations

- New technology

- Education

Additional comments and suggestions:

Companies can be supportive and help to build a strong network.

Be open for new ideas, listen to the staff, build trust and motivate creative thinking.

Follow the innovation in your business sector - see what others are doing.

UNIVERSITY-BUSINESS COLLABORATION

Collaboration with education providers and students

- Culture of education in the companies

- University in marketing, human resource, biotechnology etc. internship

Additional comments and suggestions:

- important to have cooperation and collaborations with schools/Universities to empower our grate staff and it can even create new ideas and products.

Students' entrepreneurialism and innovativeness

- New product from fish (fish oil)

- utilization - product from fish waste.

Additional comments and suggestions:

"Not everyone needs to be the innovator. There's a threat that the innovator doesn't work for you for a long time, when he discovers something new."

Challenges encountered

- Resilience

- Funding

- Time management

- Stress management

- Realism

Additional comments and suggestions:

"The money is not coming the first day. Please teach students resilience and realism in education for entrepreneurs".

"It is not fair to tell students just stories about projects of very good success. They have to know also about the challenges and difficulties of being an entrepreneur. It's one of the most difficult jobs you choose".

Threats and demand for change

- Fourth industrial revolution

- Market

- Green energy

- Informed consumers

- Digital skills

- Language skills

Additional comments and suggestions:

In the time of Fourth industrial revolutions there were a lot of changings both in work life and personal life. It gives entrepreneurs more opportunities and even challenges to come up with an idea and work it to a business opportunities.

Students must have good digital and language skills.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Educational support needed for business development

- Creative thinking

- How to work in a team

- Make a business plan

- Language skills

- How to build a network

- Project management

- Funding

- Understanding the marked

- Good digital skills

Additional comments and suggestions:

To be able to work in a team is very important and gives the entrepreneur more possibility and the idea is more likely to succeed.

Without passion the entrepreneur is not likely to succeed. It is important in education to help people to keep the passion.

Introduction from companies and entrepreneurs in the study to tell students how it is in the "real world".

Role of entrepreneurship and innovation in education in the next 5 years?

- Understanding

- Business development

- Product development

Additional comments and suggestions:

It is very important that students, companies and schools understands how important innovation and entrepreneurship is.

Important for companies to be able to hire staff with creative thinking and gives companies more possibility to be successful.

Outcomes from the group discussions with teachers, MSS

Validity of the results

The teachers were from 3 schools and are teaching and motivating young people as a part of the curriculum, people that buy their curse because they have some idea to follow or people from Directorate of labour. The length of the courses was 40 – 80 hours.

Rata is a private school who are mainly teaching and supporting "start-up" projects.

MSS Lifelong learning centre

FS College of Sudurnes

We had some meetings with each of the teachers and discussed the project and introduced them to CDTMOOC. The teachers were all interested in the project and wanted to follow the outcome later. In all the discussions the teachers mentioned how important it is to find and support students that have interest and passion for entrepreneurship and innovation. It is important to start early in elementary schools to stimulate creative thinking.

General findings

All of the teachers are using positive motivation and building confidence with the students. Three of them mentioned it is important to tell students about how it is in the "real world". Many mistakes make good results and it takes time and effort to manage. The teacher from RATA talked also about the need for support and education for funding.

ENTREPRENEURSHIP AND INNOVATION IN TEACHING

Innovation in teaching
- show the students many good ideas.
- Create a good atmosphere
- Workshops
- Brainstorming
- Teamwork
- Use the internet (Google, YouTube) to find
- Enjoy the program
- Building network
- Help them to open the mind and look inside.

Additional comments and suggestions:

"Inform students about the power of patience".

"Important to have conversations with others about innovation and entrepreneurship".

Feedback
- From the students
- No discipline problems
- Students survey
- Students achievements

Additional comments and suggestions:

All of the teachers said a positive atmosphere and support is necessary for creative thinking.

ENTREPRENEURSHIP AND INNOVATION AMONG STUDENTS

Students' entrepreneurialism and innovativeness
- very creative students
- interest
- Teachers' interest and passion are important.

Additional comments and suggestions:

"In the beginning I gave students grades between five and seven. Now they have eight to ten. It's the beginning of the course and in the end. We have won competitions three years in a row".

- Marel Masterpiece solutions
- University of Reykjavík
- BOXID: competition

Challenges encountered

- to have an idea
- put an idea into practice - start the project
- Tax regulations
- Their current financial status

Additional comments and suggestions:

"A teacher needs to be motivated and creative to infect students".

"Cooperation between schools and companies are important".

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- Teachers have to learn and follow new technique and ideas in teaching
- More time for teaching Innovation and entrepreneurship in schools.
- Should be part of all the education levels

Additional comments and suggestions:

"Teachers and school administrators must understand the importance of innovation and entrepreneurship for the community".

"Crucial element in all education".

How to ensure the best entrepreneurial-oriented and innovative education

- More art education
- Enhancing digital skills
- Collaboration with companies
- Flexibility
- Increased teacher retraining

Additional comments and suggestions:

"Everyone agreed that too many people were teaching in these studies without having good experience and education to do so".

"The teacher must have a passion also about innovation and entrepreneurship".

Outcomes from the group discussions with students, MSS

Validity of the results

Two focus groups: Group of five people from MSS and group of 5 people from College of Sudurnes (FS).

The students from MSS were finishing an Entrepreneurs course for three weeks and the students from FS were in course learning Innovation and entrepreneurship.

The students were informed about the CDT MOOC project, the purpose and outcome. We had an interview frame in English and in Icelandic and the interview was based on the frame.

One was leading the conversations and one was writing notes from the interview.

General findings

All the students had positive thinking about their course and were very willing to inform about their experience. Seven of them had an idea for entrepreneurship before the course but three students did not. The young students were interested in entrepreneurship and innovation through their class in FS as engineers, electricians or carpenters.

The MSS students were English speaking immigrants 20 years+ and the students from FS were young Icelanders (17-19 years).

ENTREPRENEURSHIP AND INNOVATION IN STUDIES

Skills for entrepreneurs

- Curiosity
- Design thinking
- Creative
- Initiative
- Education in the field the students are interested
- Interest
- Communications skills
- Solution oriented

Additional comments and suggestions:

Support from family and friends are important.

To be able to ask questions to people that have knowledge and experience is important.

Important to be patient and have skills to learn from mistakes.

Entrepreneurial institution

- Miðstöð símenntunar á Suðurensjum
- Fjölbrautaskóli Suðurnesja

Additional comments and suggestions:

"I spend many hours researching the internet using Google and YouTube".

ENTREPRENEURSHIP AS A CAREER OPTION

Knowledge of the industry

- Through work
- Rehearsing myself on the internet
- Asking questions
- Through education

Additional comments and suggestions:

"I like to go to companies or meet entrepreneurs to ask questions and learn".

A career option

- Have own company
- Manager in good company
- Have many possibilities in life and work
- Follow my passion

Additional comments and suggestions:

"In my country (Poland) I have not had the opportunity to follow my dream to be an entrepreneur".

Needed skills to be an entrepreneur

- Interest
- Education
- understand my self
- Good confidence
- Marketing skill
- Positive attitude
- Passion
- Language skills

Additional comments and suggestions:

"The keynote is to have an interest, knowledge and to be good in communications".

Skills through work practice

- Knowledge
- opportunity to ask questions
- "learning by doing"

Additional comments and suggestions:

Important to have experience from the work life.

ENTREPRENEURSHIP EDUCATION IN THE FUTURE

Role of entrepreneurship and innovation in education in the next 5 years?

- Very important to grow as a country in the 21th century.
- More and more technical and digital things around us.
- More flexibility in education and work life.

Additional comments and suggestions:

It is good for everybody to learn Innovations and entrepreneurship from childhood.

How to ensure the best entrepreneurial-oriented and innovative education

- Teach creative thinking from the beginning in schools.
- "Teach the teachers".
- Cooperation with companies.

Additional comments and suggestions:

"Sometimes it is difficult to follow your dream and it usually takes time, but it is worth it".

Annex 7 – CDTMOOC Partner Countries Digital Economy and Society Index (DESI) 2019 ranking

Digital Economy and Society Index (DESI) 2019 ranking
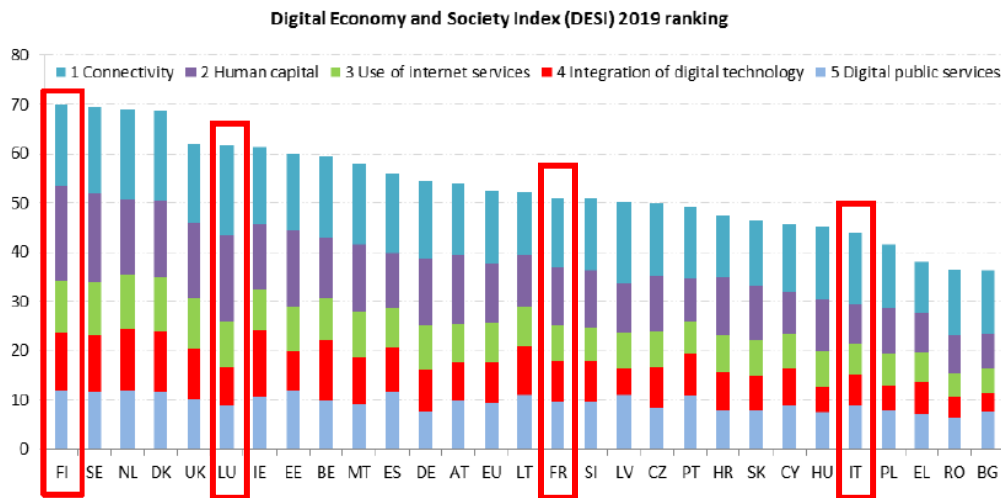
source: Digital Economy and Society Index (DESI), 2019 Country Report, Finland

The European Commission is monitoring Member States' digital competitiveness through the Digital Economy and Society Index (DESI) reports. The monitoring has been proceeded since 2015. The DESI country reports combine quantitative evidence from the DESI indicators across five dimensions of the index with country-specific policy insights and best practices. The thematic chapters present a European-level analysis of broadband connectivity, digital skills, use of the internet, digitalisation of businesses, digital public services, the ICT sector and its R&D spending, and Member States' use of Horizon 2020 funds.

Finland ranks first out of the 28 EU Member States with a score of 69.9 in the European Commission's Digital Economy and Society Index (DESI) 2019. Its overall score largely surpasses the EU average of 52.5, allowing Finland, for the first time, to become the EU digital leader. Its human capital is one of its strongest competitive advantages where 76 % of the population have basic or above basic digital skills, a long way above the EU average (57 %).

Luxembourg ranks 6th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019. The country ranks third in Human capital, improving from the previous year. The percentage of individuals with at least basic digital and software skills was well above EU average in 2017 (ranked first), while the share of ICT specialist as a percentage of total employment has increased to 5 % and is well above the EU average of 3.7 %.

France ranks 15th out of the 28 EU Member States in the European Commission's Digital Economy and Society Index (DESI) 2019. France's highest rankings are in the areas of Human capital (driven by relatively high shares of women ICT specialists and digital skills levels), and Integration of digital technology (as a relatively high proportion of French companies share information electronically or make use of big data analysis). Over the past year, France has adopted a number of important initiatives to support digitalization, including the country's plan to fight digital exclusion ("Plan

National pour un Numérique Inclusif"), funding for digital-related training under its dedicated investment plan ('Plan d'investissement dans les compétences'), a new national initiative for the digital transformation of SMEs and microenterprises ('France Num'), a national strategy for artificial intelligence, and several projects to modernise public services through digitalisation.

Italy ranks 24th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019. Italy performs relatively well as regards Connectivity and Digital public services. However, three out of ten people are not regular internet users yet, and more than half of the population still lacks basic digital skills. This shortfall in digital skills is also reflected in low use of online services. On the other hand, Italian enterprises score better on the use of electronic information-sharing software and social media.

Iceland does not appear on the chart and the latest information date back from 2015. At that time, the country was performing above the European Average in Connectivity and Use of Internet, while the Integration of Digital Technology and Human Capital were within the European average. Iceland was performing below the European average in term of Digital Public Services.

IX.   Interesting links to consult

- [Key findings from the 2019/2020 GEM Italy Report](#)
- [Entrepreneurship in Luxembourg: positive perceptions and fear of failure](#)
- [Entrepreneurship Education Podcast by USASBE](#)

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Shaping Europe's digital future, Policy, Countries' performance in digitisation https://ec.europa.eu/digital-single-market/en/countries-performance-digitisation

Teaching Entrepreneurship blog by teachers in entrepreneurship and co-founded by Doan Winkel, President of USASBE https://www.teachingentrepreneurship.org/